

**Matt Sanman**  
**Communications Coordinator –**  
**Segment 2**

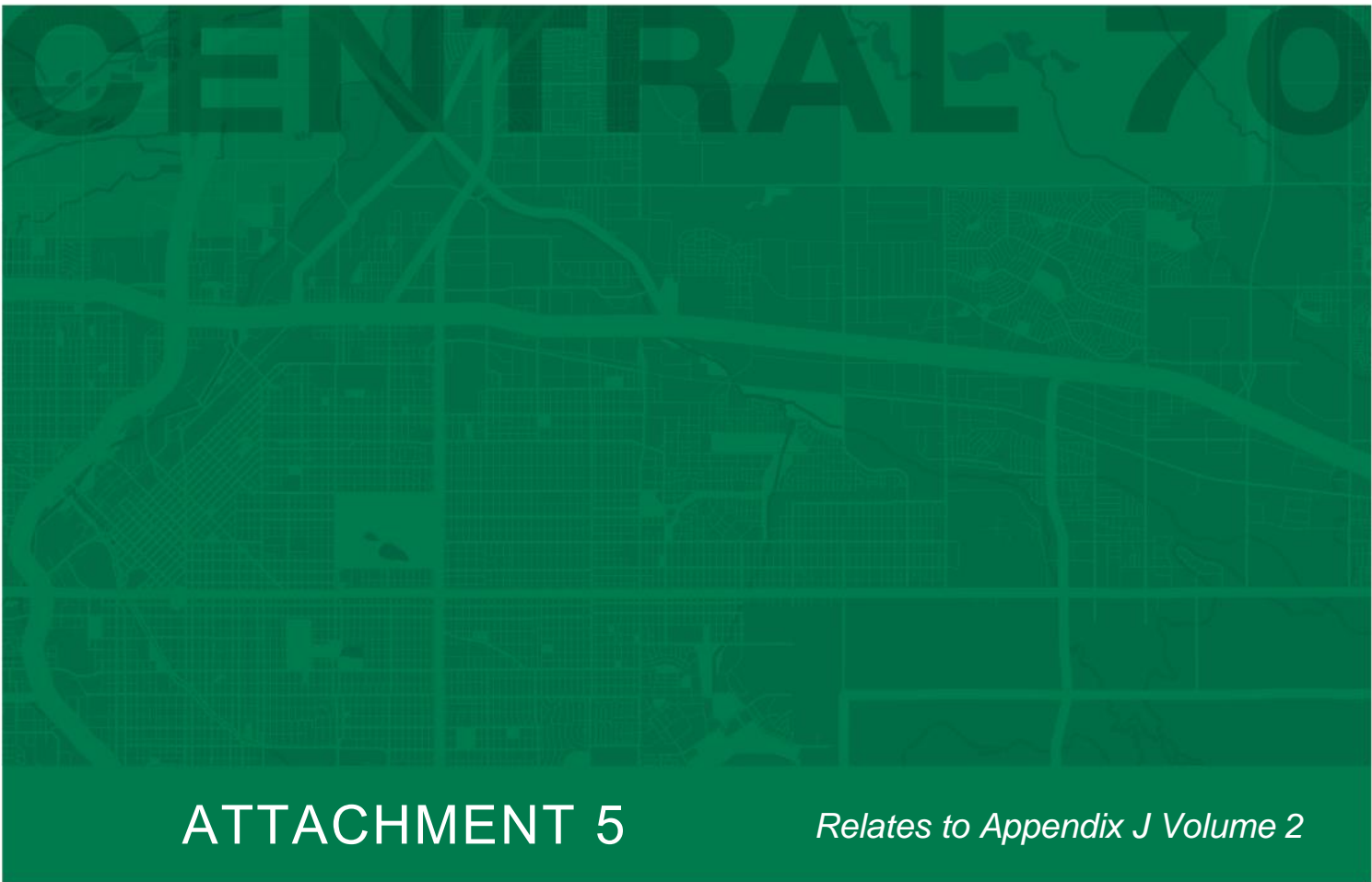


<b>YEARS OF EXPERIENCE:</b>	5 Years
<b>YEARS WITH KIEWIT</b>	5 Years
<b>EDUCATION:</b>	Bachelor degree of Business, Montana State University, Bozeman, MT

Matt Sanman has more than five years’ of experience in various roles within Kiewit’s Central District including internships in the Colorado area where he worked on the South Platte Reservoir project in Littleton and Trail Ridge Road project in Estes Park. After finishing college in 2012, Matt started his full-time Kiewit career in the Littleton District Office.

For the last two and a half years, Matt worked full-time on the DFW design-build highway project in Dallas, Texas (*KMP Schedule F Project*). Matt was the business and residential community communications lead for the project, assuming a key position within the public information team. Matt’s outreach allowed for his excellent communication skills to be valuably used to develop instant repair and respect. On this large, 28-mile corridor, Matt positioned himself as the go-to problem solver for both of the business and residential communities. He was heavily relied on by the business community as the conduit between them and Kiewit’s operations team to resolve concerns.

Matt will provide full time support for the Central 70 Project as the Communications Coordinator for Segment 2 upon Project award.



ATTACHMENT 5

*Relates to Appendix J Volume 2*



# Draft Public Involvement Contact Sheet



**SUBMITTED TO:**

Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation

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## RECORD OF REVISIONS

Revision number	Date issued	Pages affected	Comments
0	5/18/2017	All	Proposal Draft Submittal



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# PRELIMINARY PUBLIC INVOLVEMENT CONTACT SHEET

NAME	ADDRESS	PHONE / CELLPHONE	EMAIL
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**Project Director**

**HPTE Director**

**Project  
Communications  
Manager**

**Project Website  
Administrator**

**Community Liaison**

**Project Colorado  
Transportation  
Management Center  
(CMTC)**

**CITY AND COUNTY OF DENVER**

**Mayor's Office**

**Public Works**

**PI Office**

**Chamber of  
Commerce**

**Fire/Rescue**

**Police Department**

**CITY OF AURORA**

**City Manager's Office**

**Public Works**

**PI Office**

**Chamber of  
Commerce**

**Fire/Rescue**

**Police Department**

**CITY OF COMMERCE CITY**

**City Manager's Office**

**Public Works**

**PI Office**

**Chamber of  
Commerce**



PRELIMINARY PUBLIC INVOLVEMENT CONTACT SHEET			
NAME	ADDRESS	PHONE / CELLPHONE	EMAIL

**Fire/Rescue**  
**South Adams County**  
**Fire Protection**  
**District**

**Police Department**

**STATE PATROL**

**Colorado State Patrol**

**LOCAL HOSPITALS**

**Denver Health**  
**Medical Center**

**SCHOOLS/SCHOOL DISTRICT**

**Garden Place**  
**Academy**

**Swansea Elementary**  
**School**

**Harrington**  
**Elementary School**

**Smith Elementary**  
**School**

**Annunciation**  
**Catholic School**

**Bruce Randolph**  
**Middle School**

**Park Lane**  
**Elementary School**

**DCIS at Montebello**

**McGlone Academy**

**Maxwell Elementary**  
**School**

**Oakland Elementary**  
**School**

**Howell K-8 School**

**Community Service Organizations**

**The GrowHaus**

**Denver Rescue**  
**Mission –**

# PRELIMINARY PUBLIC INVOLVEMENT CONTACT SHEET

NAME	ADDRESS	PHONE / CELLPHONE	EMAIL
<b>The Crossing</b>			
<b>Focus Points</b>			
<b>Family Resource Center</b>			

## CHURCHES

<b>Globeville Community Church</b>			
<b>Greater Harvest Church of God</b>			
<b>Holy Rosary Denver</b>			
<b>Saint Joseph Polish Roman Catholic Church</b>			
<b>Pilgrim Church Congregational</b>			
<b>Iglesia Del Dios Vivo</b>			
<b>Church of Christ</b>			
<b>Light of the World Discipleship: Shiloh Temple Apostolic Pentecostal Church</b>			

## REGISTERED NEIGHBORHOOD ORGANIZATIONS AND NEIGHBORHOOD ASSOCIATIONS

<b>Civic Association of Clayton</b>			
<b>Clayton United</b>			
<b>Cole Neighborhood Association</b>			
<b>Cross Community Coalition</b>			
<b>Elyria Swanssea/Globeville Business Association</b>			





**PRELIMINARY PUBLIC INVOLVEMENT CONTACT SHEET**

NAME	ADDRESS	PHONE / CELLPHONE	EMAIL
Elyria and Swansea Neighborhood Association			
Globeville Civic Partners			
Globeville K.A.R.E.S			
Greater Park Hill Community Inc.			
Green Valley Ranch Citizens Advisory Board			
Northeast Park Hill Coalition			
Northern Corridor Coalition			
RiNo River North Art District			
Rio Norte			
Stapleton Master Community Association			
Stapleton Area Transportation Management Association			
United Community Action Network Inc.			
Morris Heights Improvement Association			

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**RECREATION/COMMUNITY CENTERS**

Stapleton Recreation Center			
Globeville/Argo Park Outdoor Pool			
St. Charles Recreation Center			
Swansea Recreation Center			

# PRELIMINARY PUBLIC INVOLVEMENT CONTACT SHEET

NAME	ADDRESS	PHONE / CELLPHONE	EMAIL
Hiawatha Davis Jr. Recreation Center			
Martin Luther King Jr. Recreation Center			
Central Park Recreation Center			
Montbello Recreation Center			
Green Valley Ranch Recreation Center			
Montbello Civic Center Park			
Sand Creek Park			
Park Hill Golf Club			
Developmental Disabilities			

## LIBRARIES

Ford-Warren Branch Library			
Valdez-Perry Branch Library			
Pauline Robinson Branch Library			
Sam Gary Branch Library			
Montbello Branch Library			

## FIRE STATIONS

Fire Station 9			
Fire Station 10			
Fire Station 26			
Fire Station 27			
Fire Station 29			
Fire Station 2			

## VISITOR/TOURIST DESTINATIONS



# PRELIMINARY PUBLIC INVOLVEMENT CONTACT SHEET

NAME	ADDRESS	PHONE / CELLPHONE	EMAIL
Pepsi Center			
Coors Field			
Sports Authority Field at Mile High			
Dick's Sporting Goods Park			
Visit Denver			
National Western Stock Show			
Ski Colorado			

## REPRESENTATIVE BUSINESSES

Mini U storage I-70 (I-70 and Colorado Blvd.)			
Safeway Distribution Center			
Safeway Distribution Center			
Eagle Claw Fishing Tackle Co.			
Bud's Warehouse			
The Shops at Northfield Stapleton (Management Office)			
Embassy Suites by Hilton Denver Stapleton			
Lincoln College of Technology			
Home Depot (Quebec and I-70)			
Walmart (Quebec and I-70)			
Goodwill Outlet World			
Tuff Shed			
Pilot Travel Center			

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# PRELIMINARY PUBLIC INVOLVEMENT CONTACT SHEET

NAME	ADDRESS	PHONE / CELLPHONE	EMAIL
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**Sapp Brothers Truck Stop**

**The Stone Collection (Montbello)**

## RAILROADS

**Union Pacific Railroad Co.**

**Denver Rock Island Railroad**

**Burlington Northern Santa Fe Railroad**

## AIRPORTS

**Denver International Airport**

## UTILITY OWNERS

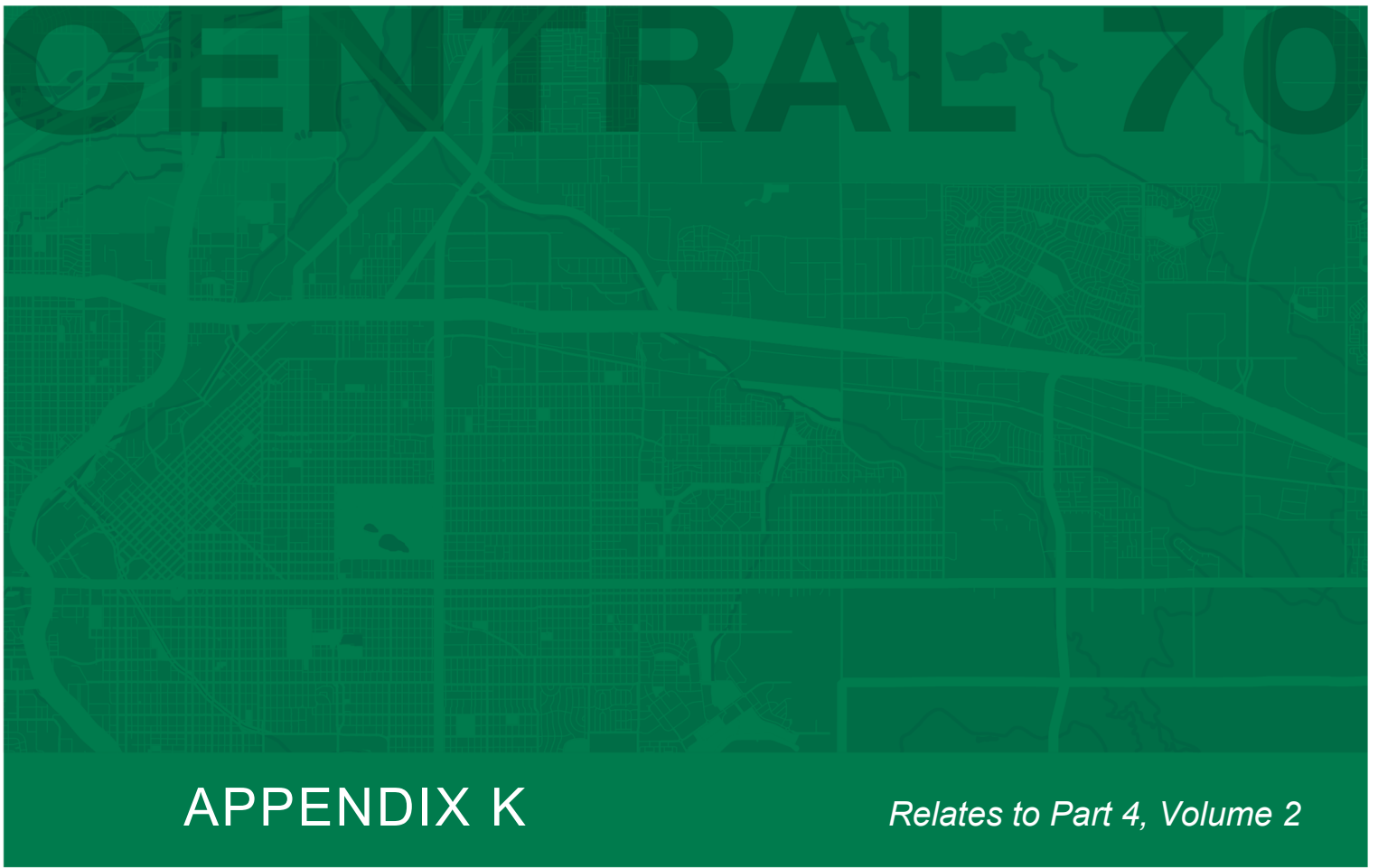
## COMMERCIAL VEHICLE OPERATORS

**Airport shuttles**

**Taxi companies**

**Ski resort shuttle services**

## OTHERS



APPENDIX K

*Relates to Part 4, Volume 2*



# Draft Small and Disadvantaged Business Participation Plan



**SUBMITTED TO:**

Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



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## SIGNATURE PAGE: APPENDIX K

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CIVIL RIGHTS PROGRAM MANAGER

DATE

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PROJECT MANAGER

DATE

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DESIGN-BUILD MANAGER

DATE

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OPERATION AND MAINTENANCE MANAGER

DATE

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DESIGN MANAGER

DATE



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## EVALUATION CRITERIA – APPENDIX K, VOLUME 2

The following Evaluation Criteria Matrix aligns the requirements for the Draft Small and Disadvantaged Business Participation Plan (SDBPP) in the Project Agreement with the sections of this plan.

Sch. 15, Appendix A, Part 1 Section	Item	SDBPP Section	Section Name	Check
<b>The Developer's SDBPP shall include the following:</b>				
<b>1.0</b>	<b>Identification of the CPRM and the other team members responsible for small business program development, including:</b>	<b>3.0</b>	Small Business Team Members	<input type="checkbox"/>
<b>1.a</b>	<ul style="list-style-type: none"> <li>The names of the Small Business Team members and team members' experience working with small businesses or agencies on transportation or construction projects.</li> </ul>	<b>3.0</b>	Small Business Team Members	<input type="checkbox"/>
<b>1.b</b>	<ul style="list-style-type: none"> <li>The roles and responsibilities of the team members, including descriptions of their activities as well as the delegated authority of the team members and how they are integrated with Key Personnel on the Project, and identification of meetings they will attend.</li> </ul>	<b>3.1</b>	Roles and Responsibilities	<input type="checkbox"/>
<b>2.0</b>	<b>Strategic Approach for Meeting Goals during the Construction Period including:</b>	<b>4.0</b>	Strategic Approach for Meeting DBE/ESB Goals during the Construction Period	<input type="checkbox"/>
<b>2.a</b>	<ul style="list-style-type: none"> <li>Outline of how Developer will calculate the value of Design Services and Other Construction Work in compliance with Part II of this Appendix A.</li> </ul>	<b>4.1</b>	Calculating Value of Design Services and Other Construction Work	<input type="checkbox"/>
<b>2.b</b>	<ul style="list-style-type: none"> <li>An estimated schedule for achievement of each of the Construction Work Small Business Goals. The Developer shall outline the expected participation toward achieving each goal over the Construction Period and identify an annual target for each goal for each Contract Year during the Construction Period. This outline shall set the framework for achieving the Construction Work Small Business Goals during the Construction Period.</li> </ul>	<b>4.2</b>	Estimated Schedule for Achievement of Goals	<input type="checkbox"/>
<b>2.c</b>	<ul style="list-style-type: none"> <li>For each Construction Work Small Business Goal, a list of the areas of Work the Developer has identified for potential DBE or ESB participation with a range of the approximate percentage of the value of the applicable Construction Work relative to the value of all Construction Work. The SDBPP must reflect a reasonable approach to meeting the goals with ready, willing and able DBEs</li> </ul>	<b>4.3</b>	Areas of Work identified for Potential DBE/ESB Participation	<input type="checkbox"/>

## EVALUATION CRITERIA – APPENDIX K, VOLUME 2

Sch. 15, Appendix A, Part 1 Section	Item	SDBPP Section	Section Name	Check
	and ESBs to perform the applicable Work. The Developer shall consult the respective directories at <a href="http://www.coloradodbe.org">www.coloradodbe.org</a> and <a href="http://www.coloradoesb.org">www.coloradoesb.org</a> to ensure availability to meet the goals. If already selected, DBE or ESB team members should be identified in respect of their relevant area(s) of Work.			
2.d	<ul style="list-style-type: none"> <li>The strategic approach to integrating achievement of small business participation into the overall approach to subcontracting, including discussion of how the Developer will communicate opportunities, create a transparent process, unbundle work to establish opportunities for small businesses, or take other actions to secure DBE and ESB participation.</li> </ul>	4.4	Integrating Small Business Participation into Overall Subcontracting Strategy	<input type="checkbox"/>
2.e	<ul style="list-style-type: none"> <li>A description of how participation will be monitored and tracked. Describe the internal procedures through which the Developer will ensure the Construction Work Small Business Goals are met. This will include distribution of the goal responsibilities to Subcontractors, collecting data on Subcontractor participation and performance, ensuring only valid performance is counted, etc.</li> </ul>	4.5	Monitoring/Tracking DBE/ESB Participation	<input type="checkbox"/>
3.0	<b>Approach to Small Business Development and Assistance including:</b>	5.0	Approach to Small Business Development and Assistance	<input type="checkbox"/>
3.a	<ul style="list-style-type: none"> <li>Methods for ensuring prompt payment to all Subcontractors (for certainty, not only DBE or ESB Subcontractors), including a description as to whether and how the Developer will implement any additional prompt payment requirements, beyond those mandated in Section 17.5 of the Project Agreement, as well as the process by which the Developer will track and monitor the following: invoicing by Subcontractors; prompt payment to Subcontractors; and release of retainage. This portion of the plan shall include any efforts that the Developer and Subcontractors that are not themselves DBEs or ESBs will make to assist with mobilization efforts and early purchase of materials, or any other payment measures that will aid the viability of small business participation in the Work.</li> </ul>	5.2	Prompt Payment to Subcontractors	<input type="checkbox"/>
3.b	<ul style="list-style-type: none"> <li>Assistance with bonding and insurance, including a description of any measures to be implemented by the Developer or its team members to assist DBEs and ESBs with bonding and insurance while maintaining compliance with the applicable provisions of this Agreement and the requirements of Law. This may include any of the following: adding DBEs and ESBs to insurance plans; waiving bond requirements; phased bonding; and limitations on bond and insurance requirements imposed by Subcontractors.</li> </ul>	5.3	Assistance with Bonding and Insurance	<input type="checkbox"/>

## EVALUATION CRITERIA – APPENDIX K, VOLUME 2

Sch. 15, Appendix A, Part 1 Section	Item	SDBPP Section	Section Name	Check
<b>3.c</b>	<ul style="list-style-type: none"> <li>• Small business outreach, training, and development including, at a minimum, a description of how Developer will:</li> </ul>	<b>5.4</b>	Small Business Outreach, Training, and Development	<input type="checkbox"/>
<b>3.c.i</b>	<ul style="list-style-type: none"> <li>○ Conduct a mandatory outreach event directed at DBE and ESB firms after the Agreement Date and prior to the issuance of NTP2</li> </ul>	<b>5.4.1</b>	Outreach Events Prior to the Issuance of NTP2	<input type="checkbox"/>
<b>3.c.ii</b>	<ul style="list-style-type: none"> <li>○ Collaborate with and utilize the CDOT's established Connect2DOT Program (<a href="http://www.connect2dot.org">www.connect2dot.org</a>)</li> </ul>	<b>5.4.2</b>	Connect2DOT outreach	<input type="checkbox"/>
<b>3.c.iii</b>	<ul style="list-style-type: none"> <li>○ Assist in the development and facilitation of a Connect2DOT Transportation Leading Edge Course for firms participating or seeking to participate in the Construction Work (see <a href="http://www.connect2dot.org/need-assistance/leading-edge">http://www.connect2dot.org/need-assistance/leading-edge</a> for more information)</li> </ul>	<b>5.4.3</b>	Connect2DOT's leading edge for transportation and construction program	<input type="checkbox"/>
<b>3.c.iv</b>	<ul style="list-style-type: none"> <li>○ Regularly bring Project updates to, and participate in, the CDOT's quarterly Small Business Collaborative Forums</li> </ul>	<b>5.4.4</b>	Small business meeting	<input type="checkbox"/>
<b>3.c.v</b>	<ul style="list-style-type: none"> <li>○ On a monthly basis, provide a list of upcoming subcontracting opportunities and events for distribution via the Connect2DOT newsletter</li> </ul>	<b>5.4.5</b>	Connect2DOT Newsletter	<input type="checkbox"/>
<b>3.c.vi</b>	<ul style="list-style-type: none"> <li>○ Conduct any other measures of outreach, training and development and the resources dedicated to such measures</li> </ul>	<b>5.4.6</b>	Resources for Outreach, Training, and Development	<input type="checkbox"/>
<b>3.c.vii</b>	<ul style="list-style-type: none"> <li>○ Conduct any other activities or efforts not included in the above related to achievement of the Construction Work Small Business Goals</li> </ul>	<b>5.4.7</b>	Other Activities	<input type="checkbox"/>

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# 1. Project Summary

## 1.1 KIEWIT-MERIDIAM PARTNERS CORE VALUES

Kiewit-Meridiam Partners (KMP) is committed to delivering the Central 70 Project (Project) with a focus on client relations, achieving the Project goals, and maintaining transparency with the Department. To achieve these objectives, the KMP Team has adopted the following core values:

### KMP Core Values

Every day we strive to fulfill our role as stewards in our communities—after all, we work in our own backyards.

#### STEWARDSHIP



#### PEOPLE

We are relentless in our ongoing focus that *Nobody Gets Hurt*. We hire bright minds that are hungry for the best training available and committed to Team success.



**KMP's four core values form the cornerstone of our company and the sum of our business ethics conduct. We train on these values so that they are constantly on the minds of our leaders and workforce.**



#### INTEGRITY

We conduct ourselves with the highest levels of integrity. We are responsible, accountable, honest, straightforward, and deal fairly with everyone.



#### EXCELLENCE

We focus on quality production, commit to excellence, and encourage new and innovative ideas. We build our work *Right First Time*.



### 1.2 PLAN MANAGEMENT

This Project summary is presented at the start of each Appendix to serve as a quick reference to our core values, the Project overview, our Team’s composition, and our Key Personnel and Critical Staff. We developed each Appendix to demonstrate our understanding of the Project requirements and facilitate timely Approval by the Department after award.

This document describes KMP’s approach for the Work. KMP will resubmit this Plan, including an updated Project summary, to the Department as required per the Project Agreement.

All Project plans, including this document, are stored electronically per KMP’s Document Control System (DCS) Plan. Revisions to these documents may be required as the Project progresses, and annual updates are completed in accordance with Section 4.2 of the Project Management Plan (PMP). The latest revision of all Management Plans will be stored per KMP’s DCS and submitted to the Department through Aconex.

### 1.3 OVERVIEW

The Project is a Public-Private Partnership to design, build, finance, operate, and maintain planned improvements to the I-70 corridor between I-25 and Tower Road.

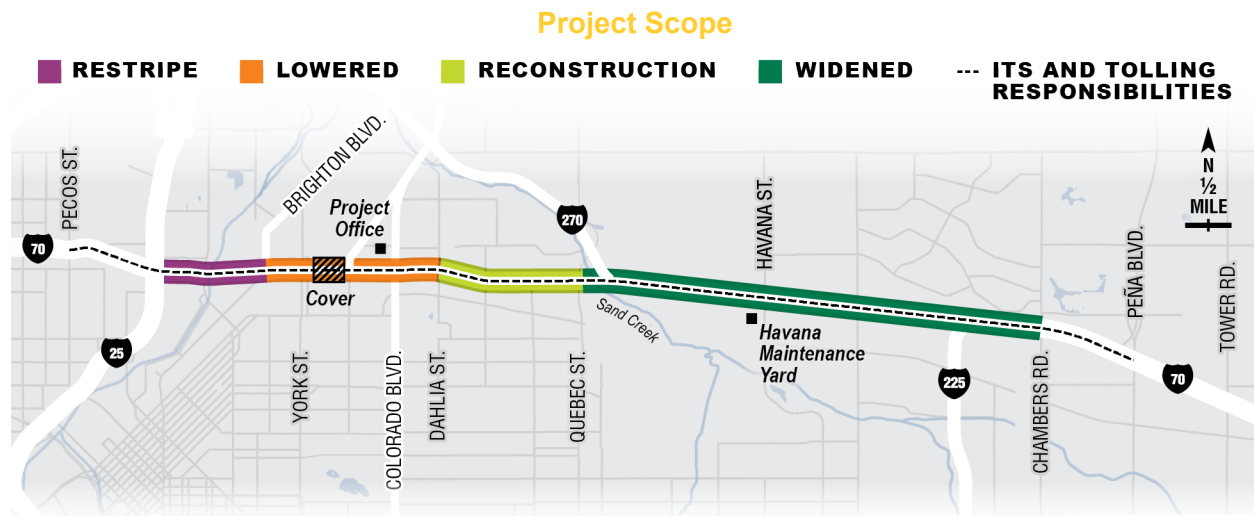
The Project’s scope is broken down into the following timeframes:

#### Project Time Frames

Time Frame	Period	Description	Estimated Duration
Notice of Award to NTP1	Submittals	Plan development, submittals, and mobilization of Quality Management staff	3 months
NTP1 to NTP2	Construction	Financial Close and Design	6 months
NTP2 to Substantial Completion	Construction	Construction and O&M During Construction (other than snow and ice control services)	45 months
Pre-Substantial Completion to Substantial Completion	Transition	Transition from Construction to Operating Period, and O&M submittals	8 months
Substantial Completion to Final Acceptance	Operating	Final submissions and inspections	4 months
Substantial Completion to Expiry Date	Operating	Operations and Maintenance (including Renewal Work)	30 years
NTP3 to Term	Construction, Operating	KMP snow and ice control services	33-34 years
62-68 months prior to Expiry Date	Operating	Handback Inspections, Handback Work, and Department training to facilitate seamless handover at Expiry Date	62-68 months



Improvements made by KMP during the Construction Period, highlighted in the figure, are described below.



### 1.3.1 RESTRIPE: I-25 TO BRIGHTON BOULEVARD

Restriping I-70 from I-25 to Brighton Boulevard to accommodate one managed lane in each direction, including:

- Design and Construction for improvements to associated drainage infrastructure

### 1.3.2 LOWERED: BRIGHTON BOULEVARD TO DAHLIA STREET

Full reconstruction of I-70 between Brighton Boulevard and Dahlia Street, including:

- Removing the viaduct between Brighton Boulevard and Colorado Boulevard, and reconstructing the Interstate below grade to accommodate the Ultimate Project roadway configuration and associated elements
- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing the Interstate structures over Brighton Boulevard
- Constructing the Cover and associated elements over the Interstate between Columbine Street and Clayton Street
- Constructing cross-street structures at York Street, Josephine Street, Columbine Street, Clayton Street, Fillmore Street, Steele Street/Vasquez Boulevard, Cook Street, Monroe Street, and Colorado Boulevard
- Constructing I-70 Mainline structures at Dahlia Street
- Removing one Railroad structure, and Constructing two Railroad structures at Union Pacific Railroad (UPRR) and BNSF Railway (BNSF)

### 1.3.3 RECONSTRUCTION: DAHLIA STREET TO SAND CREEK

Full reconstruction of I-70 Mainline between Dahlia Street and Sand Creek, including:



- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing Interstate structures over Holly Street, Monaco Street, Denver Rock Island Railroad, and Quebec Street

#### 1.3.4 WIDENED: SAND CREEK TO CHAMBERS ROAD

Widening I-70 from Sand Creek to Chambers Road with associated elements, including:

- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing the I-270 flyover structure to I-70 eastbound
- Removing and replacing Interstate structures over Peoria Street

#### 1.3.5 INTELLIGENT TRANSPORTATION SYSTEMS (ITS) AND TOLLING RESPONSIBILITIES

Additional ITS and tolling responsibilities, including:

- Closed circuit television (CCTV) camera coverage for I-70 corridor, including interchanges between Pecos Street and Airport Boulevard
- Microwave vehicle radar detection between Pecos Street and Tower Road
- Travel time indicators between Pecos Street and Tower Road
- Lane use signals between Pecos Street and Chambers Road
- Dedicated short range communications radios between Pecos Street and Tower Road

#### 1.3.6 OPERATIONS AND MAINTENANCE (O&M) WORK DURING CONSTRUCTION

Operations and maintenance of existing infrastructure within the O&M Limits During Construction as defined by the Project Agreement, including:

- I-70 Mainline and associated infrastructure
- Local Agency infrastructure
- Drainage
- Water quality
- ITS and electronic toll collection facilities
- Utility services
- Traffic signals and lighting
- Railway structures
- Fencing
- Snow and ice control services (following NTP3)

#### 1.3.7 OPERATIONS AND MAINTENANCE WORK DURING THE OPERATING PERIOD

Operations and maintenance of I-70 within the limits defined by Schedule 11 of the Project Agreement for the Operating Period (dashed line in figure above), including:

- Providing resources to safely maintain the roadway throughout the Term

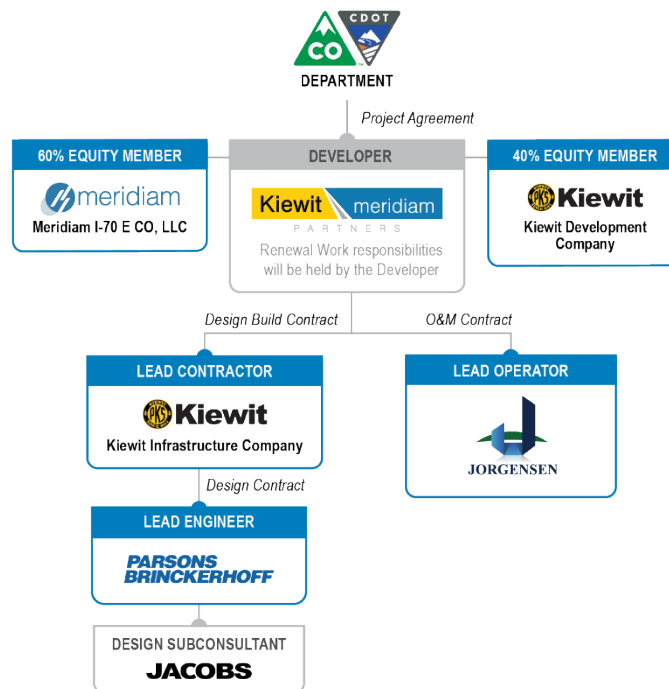
- Asset preservation including repair and Renewal
- Snow and ice control services
- Courtesy patrols
- Incident response
- Meet Handback requirements

### 1.4 KIEWIT-MERIDIAM PARTNERS COMPOSITION

KMP organized a streamlined Team to successfully deliver the Central 70 Project. The Core Proposer Team Members of Meridium, Kiewit, Parsons Brinckerhoff, and Jorgenson are united by a commitment to Project success under a common project management system. KMP’s lean approach has been cultivated from a history of working together, and by our shared cultures of safety, quality, environmental stewardship, and community service. The KMP Team needs no learning curve to start working together, and is positioned to execute on our joint Project delivery commitments from day one.

KMP’s equity members—Meridium and Kiewit Development Company—formed KMP for the sole purpose of developing this Project. KMP’s Core Proposer Team Members, shown below, include Kiewit Infrastructure Company (KIC) as the Lead Contractor, Roy Jorgensen Associates (Jorgensen) as Lead Operator, and Parsons Brinckerhoff (PB) as Lead Engineer. Our Team is supported by the expertise of subconsultants and subcontractors who possess additional local knowledge and experience, including Jacobs as PB’s main Design subconsultant. KMP is committed to identifying opportunities to maximize the involvement of small and disadvantaged businesses. Throughout the Project, KMP will remain the single point of responsibility for meeting all Project Agreement requirements.

KMP will co-locate with the Department in both the Project Office and the Colorado Transportation Management Center (CTMC) to foster a collaborative approach that ensures we meet the Department’s Project goals throughout the Project.





### 1.5 KEY PERSONNEL AND CRITICAL STAFF

The table below shows KMP’s Key Personnel who will be overseeing the Project. KMP has also identified positions, and individuals, as Critical Staff who will be instrumental in the successful delivery of the Project.

#### Key Personnel and Critical Staff

Staff Type	Title	Name	Employed by	Seconded to
KEY PERSONNEL	Project Manager	Chris Hodgkins	Meridiam	KMP
	Design-Build Manager	Tom Howell	KIC	
	Construction Manager	Barry Thoendel	KIC	
	Design Manager	Doug Andrew, PE	PB	
	O&M Manager	Abraham Henningsgaard, PE	Jorgensen	
	Project Quality Manager	Gordon Peterson, PE	KIC	KMP
	Independent Design Quality Manager	James Rozek, PE	PB*	
	Construction Process Control Manager	Sean McAfee	KIC	
	Independent Quality Control Manager	Tracy Martin, PE	KIC*	
	Environmental Manager	Jenn Bradtmueller, PE	KIC	KMP
	Utilities Manager	Kevin Custy	Jacobs	KIC
	Project Communications Manager	Hunter Sydnor	KIC	KMP
CRITICAL STAFF	Technical Manager	Martin Currie	KDC	KMP
	Financial Manager	Christopher Couallier	Meridiam	KMP
	Safety Manager	Ben Snow	KIC	KMP
	Construction Safety Manager	Kenyon Manley	KIC	
	Civil Rights Program Manager	Matt Christensen	KIC	
	DBE/ESB Program Manager and Outreach Training Manager	Colean Bembry	KIC	
	Lead Scheduler	Mauricio Solano	KIC	
	Design Integration Manager	Tim Nelson	KIC	
	Deputy Design Manager	Mark Talvite, PE	Jacobs	
	Cover Design Manager	Heath Therrien, PE	PB	
Commercial Manager	Jamie Harvey, PE	KIC		

*\*Per Approved ATC 9.1 (see Attachment to the Quality Management Plan), KMP shall use in-house personnel in lieu of employees from an Independent Quality Control Firm*

## 2. Introduction

KMP is committed to providing substantial Disadvantaged Business Enterprise (DBE) and Emerging Small Business (ESB) participation on the Project and will meet, or exceed, the goals established for small and disadvantaged business and local workforce participation during Design Services and the Construction Period.

### Central 70 DBE/ESB Goals (Construction Period)

Function	Required Percentages
Design DBE	11.6%
Design ESB	3.0%
Construction DBE	12.5% <sup>1</sup>
Construction ESB	3.0% <sup>2</sup>
1) Exclusive of Routine O&M Work	
2) Inclusive of Routine O&M Work	

This document uses the terms DBE/ESB and small business interchangeably to encompass small, disadvantaged, and emerging businesses.

KMP and its team members use a comprehensive approach—focusing on effective outreach, compliance monitoring, and capacity building—to maximize participation by DBE/ESB firms. Our approach reflects an integrated strategy, with each element building upon the others, to ensure steady progress towards meeting, and exceeding, DBE/ESB participation goals.

All of KMP’s team members have a strong and solid history of exceeding DBE/ESB goals (see Section 4 for details of past performance), and each believes in the value of DBE/ESB programs and the important benefits these firms provide to the growth of our industry.

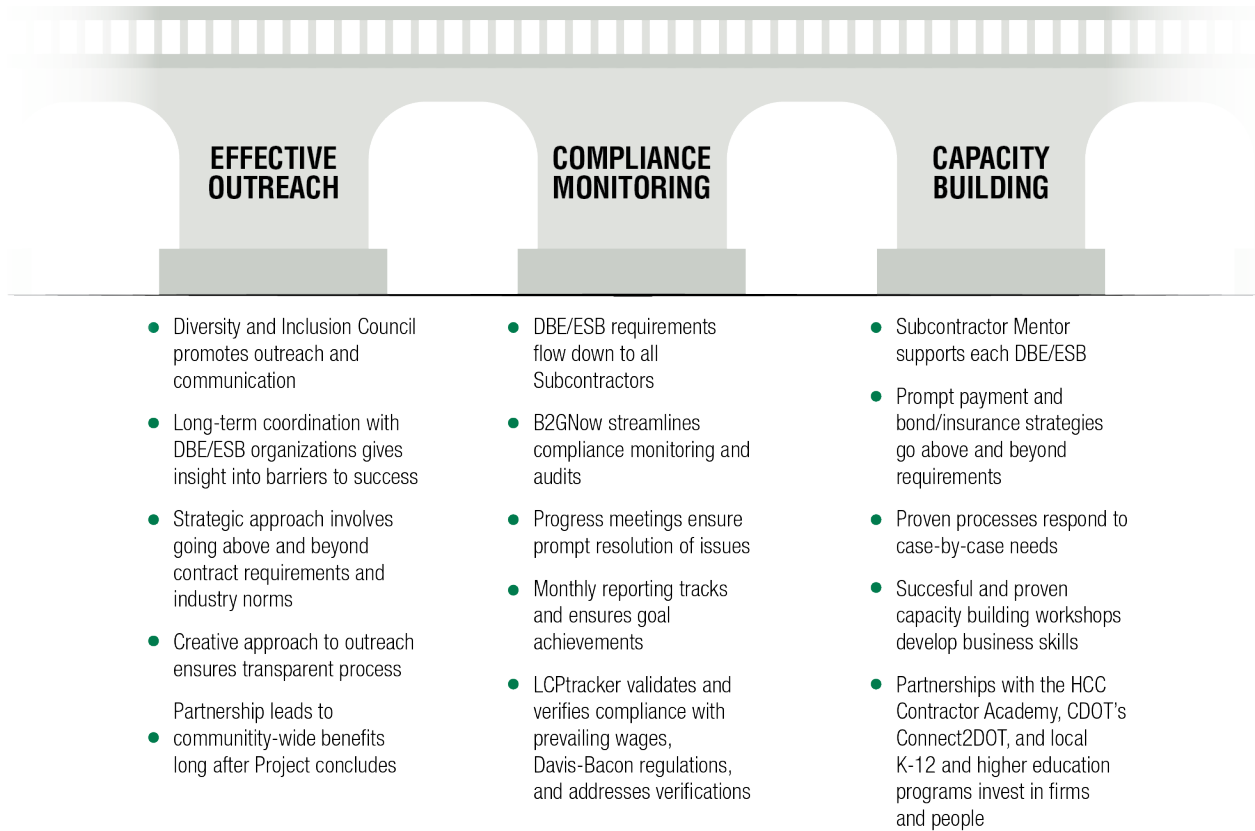
For the Project, KMP’s objectives are to enhance the competitive position of small businesses, build marketable skillsets among individuals, diversify the skillsets of small businesses, and strengthen resources within the community to sustain success long after the Project concludes. We demonstrate this commitment by implementing a comprehensive Small and Disadvantaged Business Participation Plan (SDBPP) for the Project that focuses on opportunities during the Construction Period. We will update our plan after Substantial Completion to continue providing opportunities, and support, throughout the Operating Period.

We focus on:

- Developing substantial, and meaningful, subcontractor and subconsultant opportunities for DBE/ESB firms
- Identifying barriers that may limit diversity and opportunity for DBE/ESB firms, and working jointly with those firms to remove or eliminate those barriers
- Providing assistance, training, and support before and during the life of the Project as permissible under the Commercially Useful Function (CUF) guidelines.
- Implementing best practices through all contracting tiers using a comprehensive communication, monitoring, tracking, reporting, and compliance program



## KMP Uses a Comprehensive Approach to Maximize Inclusion of DBE/ESB Firms



KMP forwards our SDBPP to the Department for Approval prior to the issuance of NTP1. We intend the SDBPP to be a dynamic document, which we will update based on the final scope of work and the Project Schedule, or as the Department requests.

We recognize that this Project provides an opportunity to create community-wide benefits and we look forward to working with the Department to increase business retention, support workforce development programs, and build capacity through collaboration with the public and private sectors. We direct our efforts toward providing opportunities for DBE/ESB firms so the Project reflects diversity and strengthens the local economy.

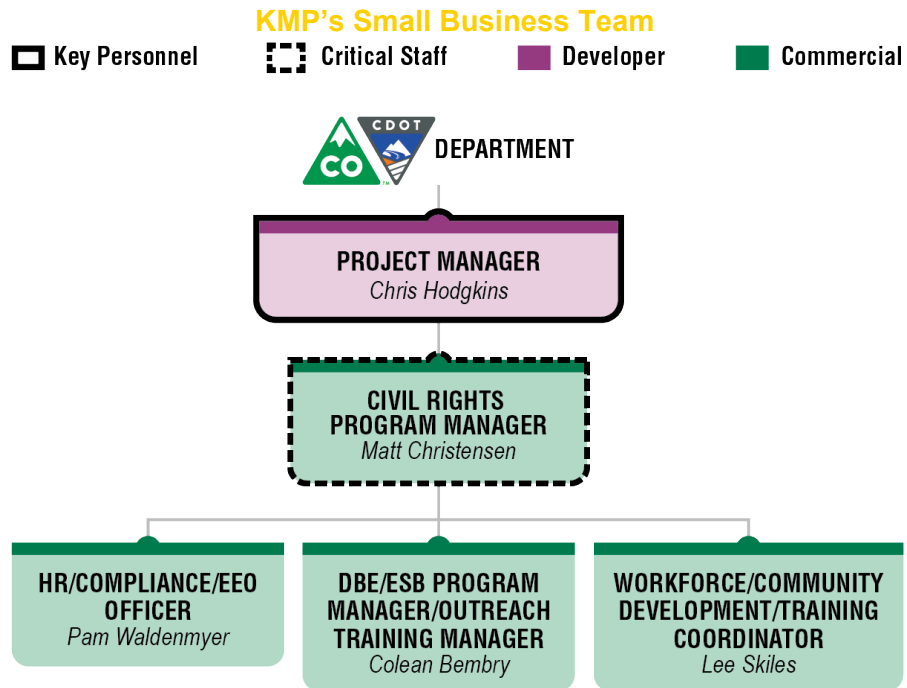
### 3. Small Business Team Members

Matt Christensen, our Civil Rights Program Manager (CRPM), serves as the primary contact with the Department. With his 30 years of professional experience working on transportation-related construction projects and his service on the Hispanic Contractors of Colorado (HCC) Board, Matt brings his extensive knowledge of small business and workforce regulations to the Project, and implements many best practices to confirm compliance with all Civil Rights Requirements.

KMP has assigned Colean Bemby as its DBE/ESB Outreach/Training Program Manager to direct the activities of the Small Business Team and confirm compliance with applicable regulations for the Design and Construction Period. Prior to Substantial Completion, we will

identify an individual responsible for Civil Rights Requirements during the Operating Period and inform the Department of any changes during the remainder of the Term.

The organizational chart below, and the table that follows, identify the members of our Small Business Team and their relevant experience working with DBE/ESB firms and oversight agencies for transportation or construction projects.







## Small Business Team Members and Relevant Experience

Small Business Team Member	Experience
<p><b>Matt Christensen</b> <i>Civil Rights Program Manager</i></p>	<p>Matt's 30 year career at Kiewit Infrastructure has included many leadership positions working on major infrastructure projects throughout Colorado, including Glenwood Canyon, I-225 Light Rail, and US34 Emergency Repairs. As District Engineer, Matt is currently responsible for ensuring that our estimators, designers, and construction staff are fully compliant with all Federal Aid provisions including outreach and support to increase the use of DBE and ESB firms.</p> <p>Matt is a member of the Kiewit Diversity Council, Board member of HCC and active with the Conference of Minority Transportation Officials (COMTO) where he has been involved with numerous programs and initiatives to support the integration and growth of both organizations.</p>
<p><b>Colean Bembrly</b> <i>DBE/ESB Program Manager/ Outreach Training Manager</i></p>	<p>Colean started with Mass Electric Construction Company (a Kiewit subsidiary) as an intern in 2006. Her initial internship was a program of COMTO Colorado. Colean worked for Mass Electric while attending college and gained hands-on experience working with subcontractors in the field. During all of her work experiences, she has learned valuable skills in client and small business management and relationships. Colean's technical experience includes quality management, construction management, field engineering, rail transit power systems, signals, and communications systems for projects in the transportation industry. Colean has served as a Quality Manager and engineer on complex alternative delivery projects.</p> <p>In addition to Colean's responsibilities as a Quality Manager, she has always followed her passion for supporting the small and diverse business community. She has been a leader on the Kiewit Diversity and Inclusion Council and she is an active participant with COMTO locally and nationally, currently serving on the COMTO National Scholars Committee. These activities have allowed her to develop close relationships within the DBE/ESB community, working with numerous firms on local projects.</p>
<p><b>Pam Waldenmyer</b> <i>Human Resources Manager, Contract Compliance Manager, and EEO Officer</i></p>	<p>Pam joined Kiewit Corporation in 2012 with the Central District working with the Human Resources group. In 2014 Pam was asked to lead the Talent Management efforts for the district as the District HR Manager. Pam led all of the people management efforts to support the business.</p> <p>In her current role as the Sr. HR Business Partner for the Central District, she holds a lead role in collaborating with the organization to become more efficient and effective in the HR processes across the organization.</p> <p>Central 70 will have a direct focus on increasing the engagement of employees who are local to the Project area, an ideal task for Pam, who currently promotes the hiring and growth of talented personnel through in-house training, mentoring, and on-the-job training.</p>
<p><b>Lee Skiles</b> <i>Workforce/ Community Development/ Training Coordinator</i></p>	<p>Lee Skiles has 44 years of experience serving as a Project Business Manager, Area Business Manager, Project Compliance Manager, and most recently, District Compliance Manager.</p> <p>In his storied career including his current role, Lee has the background, skills, responsibility, and authority to garner respect from all who work with him. He provides the appropriate guidance and leadership to get results, including delivery of KMP's workforce development and training efforts on the Central 70 Project.</p>



### 3.1 ROLES AND RESPONSIBILITIES

The next table identifies the roles and responsibilities of each Small Business Team member and their relationship to Key Personnel on the Project.

#### Roles and Responsibilities of Small Business Team Members

Role	Responsibilities
<b>Matt Christensen</b>	<p><b>Civil Rights Program Manager</b></p> <ul style="list-style-type: none"> <li>• Reports to the Project Manager</li> <li>• Directs day-to-day operations of the Small Business Team</li> <li>• Coordinates Civil Rights efforts with other Key Personnel for Design, Construction, and Operations and Maintenance (O&amp;M) services</li> <li>• Confirms compliance with:               <ul style="list-style-type: none"> <li>○ Davis-Bacon and Related Acts (DBRA)</li> <li>○ Federal Aid Construction Contracts, Form FHWA 1273–Schedule 15.1.1.1.e</li> <li>○ Equal Employment Opportunity</li> <li>○ Title VI of the Civil Rights Act</li> <li>○ Americans with Disabilities Act</li> <li>○ Small business participation and workforce development</li> <li>○ Community development programs</li> </ul> </li> <li>• Confirms compliance by all subcontractors</li> </ul>
<b>Colean Bemby</b>	<p><b>DBE/ESB Program Manager</b></p> <ul style="list-style-type: none"> <li>• Reports to the Civil Rights Program Manager</li> <li>• Communicates with small business community regarding schedules for bid packages</li> <li>• Coordinates with the Project Communications Manager to confirm that outreach efforts are using consistent communications messaging and tools</li> <li>• Responsible for DBE/ESB recruitment, outreach, management, monitoring, oversight, and reporting for EEO compliance</li> <li>• Serves as DBE/ESB liaison with the Department</li> <li>• Attends regularly scheduled meetings regarding the purchasing/subcontracting process</li> <li>• Coordinates with Discipline Leads to develop bid packages that are the appropriate size and scope for small businesses</li> </ul> <hr/> <p><b>DBE/ESB Outreach/ Training Manager</b></p> <ul style="list-style-type: none"> <li>• Reports to the Civil Rights Program Manager</li> <li>• Communicates with the Construction Manager, Discipline Leads, and subcontractors to identify and monitor training needs</li> <li>• Develops and implements training process for Project personnel regarding DBE/ESB program and EEO compliance</li> <li>• Develops and implements training programs to increase DBE/ESB success on the Project and help DBE/ESB firms grow their businesses in the future</li> </ul>



	Role	Responsibilities
<b>Pam Waldenmyer</b>	<b>HR Manager</b> <b>Contract</b>  <b>Compliance Manager</b>  <b>EEO Officer</b>	<ul style="list-style-type: none"> <li>• Reports to the Civil Rights Program Manager</li> <li>• Responsible for development, implementation, and management of the following:               <ul style="list-style-type: none"> <li>○ Employee hiring and engagement</li> <li>○ Talent assessment</li> <li>○ Change management</li> <li>○ Succession planning</li> </ul> </li> <li>• Coordinates a cross-functional team to execute key initiatives identified by KMP Executive Management</li> </ul>
<b>Lee Skiles</b>	<b>Workforce/ Community Development/ Training Coordinator</b>	<ul style="list-style-type: none"> <li>• Reports to the Civil Rights Program Manager</li> <li>• Responsible for workforce recruitment, outreach, management, monitoring, oversight, and reporting for workforce development and EEO compliance</li> <li>• Serves as workforce development liaison with the Department</li> <li>• Coordinates KMP outreach and operations with our union partners (operating engineers, laborers, and carpenters) as well as subcontractors</li> <li>• Responsible for training of Project personnel for workforce development program and EEO compliance</li> <li>• Develops training programs and works with unions/community partners for effective implementation of workforce training programs</li> <li>• Partners with Ana Mostaccero of Bilingual Communications Services, a member of the Public Information Team, to develop necessary trainings and communications in Spanish</li> </ul>

### 4. Strategic Approach for DBE/ESB Goals during the Construction Period

KMP’s strategic approach to meet, and exceed, DBE/ESB goals during the Construction Period promotes diversity and inclusion by supporting successful identification and interaction with DBE/ESB firms. We create meaningful partnerships with DBE/ESB firms through our local and national organizations. Our partnerships extend beyond contract requirements and industry norms, and provide the capacity-building support that small businesses need to grow and succeed. By having relationships within the small business community, we can develop work packages that fit their capacity and strengths.

#### Creating Partnerships That Help Small Businesses Succeed

Members of the KMP Team are active with many minority business organizations, including:

- Hispanic Contractors of Colorado (HCC) 15 years
- Conference of Minority Transportation Officials (COMTO) 10 years
- Black Construction Group (BCG) 5 years
- Women's Transportation Seminar (WTS) 10 years

As highlighted in our team’s successful partnership with the St. Andrews Construction Services Corporation (see inset) our participation, leadership, and sponsorships in these and other industry organizations have enabled us to build strong, personal and professional relationships with small business owners throughout the City and County of Denver, metro-Denver area, and statewide. These relationships and regular interaction at networking events, meetings, and workshops allows us to maintain two-way communication—reducing potential barriers to DBE/ESB participation in major infrastructure projects—and discuss ways to alleviate some of the pressures that small business owners face. Above all, these relationships encourage us to create substantive, and lasting, partnerships that help DBE/ESB firms to succeed.

The table below shows a small grouping of our team’s recent DBE/ESB participation goals on small and large projects, demonstrating our commitment to exceeding the stated goals and sustaining long-term relationships with DBE/ESB firms that boost local economies and benefit each of the firms that contribute to these projects.



Kiewit’s partnership with St. Andrews Construction, a Denver-based DBE, illustrates our commitment to building relationships with DBE/ESB firms. Kiewit subcontracted with St. Andrews Construction on the T-REX Project in 2002, on the Denver Union Station Transportation Improvements (DUS) Project in 2011, and on the I-225 Rail Project in 2013. Their partnership with Kiewit progressed from a relatively small contract for electrical systems on the T-REX Project, to a larger electrical scope of work on the DUS Project, and now includes installation of duct banks, conduits, and electrical systems for station platforms and parking lots on the I-225 Rail Project.

As a result of past partnerships with Kiewit, and their high-quality services, St. Andrews Construction has been able to contract with other firms—taking on more complex scopes of work and responsibilities. The firm has grown from seven employees in 2002, to 85 employees during the T-REX Project, to 50 employees today. Revenues total nearly \$10 million/year. St. Andrews Construction has become a valued and influential partner on Kiewit projects and contributes substantially to the Denver construction community by actively partnering with fellow DBE/ESB firms in support of Kiewit’s Diversity and Inclusion Council.



**KMP Team's Past Experience Meeting, and Exceeding, DBE/ESB Participation Goals**

Project Name/Location	Goal (Percent)	Actual (Percent)	Variance from Goal
<b>DESIGN/CONSTRUCTION SERVICES</b>			
<b>I-225 Rail Line</b> <i>Aurora, CO</i>	25%	32%	<b>+28%</b>
<b>Port of Miami Tunnel (POMT)</b> <i>Miami, FL</i>	8.1%	8.5%	<b>+4 %</b>
<b>Denver Union Station Transit Improvements</b> <i>Denver, CO</i>	16% Construction 15% Design	23% Construction 15% Design	<b>+43 %</b>
<b>Pecos Street Bridge over I-70</b> <i>Denver, CO</i>	10%	19%	<b>+90 %</b>
<b>Safe and Sound Bridge Improvement Project</b> <i>Statewide, MO</i>	7%	8%	<b>+14 %</b>
<b>Dallas Area Rapid Transit: Orange Line</b> <i>Dallas, TX</i>	39%	46%	<b>+17 %</b>
<b>Sound Transit: D770 Airport Link</b> <i>Seattle, WA</i>	33%	36%	<b>+9 %</b>
<b>LA Metro: Crenshaw</b> <i>Los Angeles, CA</i>	28%	34%	<b>+21 %</b>
<b>Houston METRO LRT</b> <i>Houston, TX</i>	39%	42%	<b>+7 %</b>
<b>Dallas-Fort Worth Connector</b> <i>Dallas-Fort Worth, TX</i> (Design Engineer, Parsons Brinckerhoff)	12%	12%	<b>+43 %</b>
<b>Massachusetts Bay Transportation Authority: Green Line</b> <i>Boston, MA</i>	3%	10%	<b>+233 %</b>
<b>Denver International Airport (DIA): South Terminal Redevelopment Program (STRP) Enabling Project</b> <i>Denver, CO</i>	20%	23%	<b>+15 %</b>

Project Name/Location	Goal (Percent)	Actual (Percent)	Variance from Goal
<b>OPERATIONS AND MAINTENANCE SERVICES</b>			
<b>North Texas Tollway Authority</b> <i>Dallas, TX</i>	30%	37%	<b>+23%</b>
<b>CTRMA: Emergency Services</b> <i>Austin, TX</i>	-	60%	-
<b>Transurban: I-495</b> <i>Florida</i>	10%	13%	<b>+30%</b>
<b>Transurban: I-495 Special Projects</b> <i>Florida</i>	10%	14%	<b>+40%</b>

### Going Above and Beyond: Kiewit’s Diversity and Inclusion Council

Another key element in our strategic approach to exceed DBE/ESB participation goals consists of promoting diversity beyond industry norms. Kiewit’s Diversity and Inclusion Council, established in 2010, focuses on both internal and external processes to increase the participation of small businesses on our projects. The Council develops and provides in-house training to expand understanding of different cultures, the barriers for entry, and the challenges small businesses face—cash flow, capacity, workforce issues, access to bonding, and insurance. The Council’s oversight reinforces our commitment that all of our projects, across the country, achieve DBE/ESB participation goals—whether a project identifies specific goals or not.

To increase exposure and experience with issues related to diversity and inclusion Kiewit encourages employees at all levels to participate on the Council. Matt Christensen, our CRPM, and Colean Bemby, our DBE/ESB Program Manager and Training Outreach Manager, have been members of the Diversity and Inclusion Council for many years and their experience and training will benefit the Project’s focus on the small business community.

The Diversity and Inclusion Council sponsors external activities including small business events, such as Koffee with Kiewit where small businesses network with key operations and design and construction personnel, and discuss subcontractor opportunities. KMP participated in multiple Koffee with Kiewit events. The infographic below demonstrates the success of the Koffee with Kiewit events, with more than 1,000 small business attendees. These events, as well as KMP’s other outreach events, are part of a comprehensive strategy for guiding outreach activities, supporting small businesses, and increasing the number of bidders specifically for the Project.



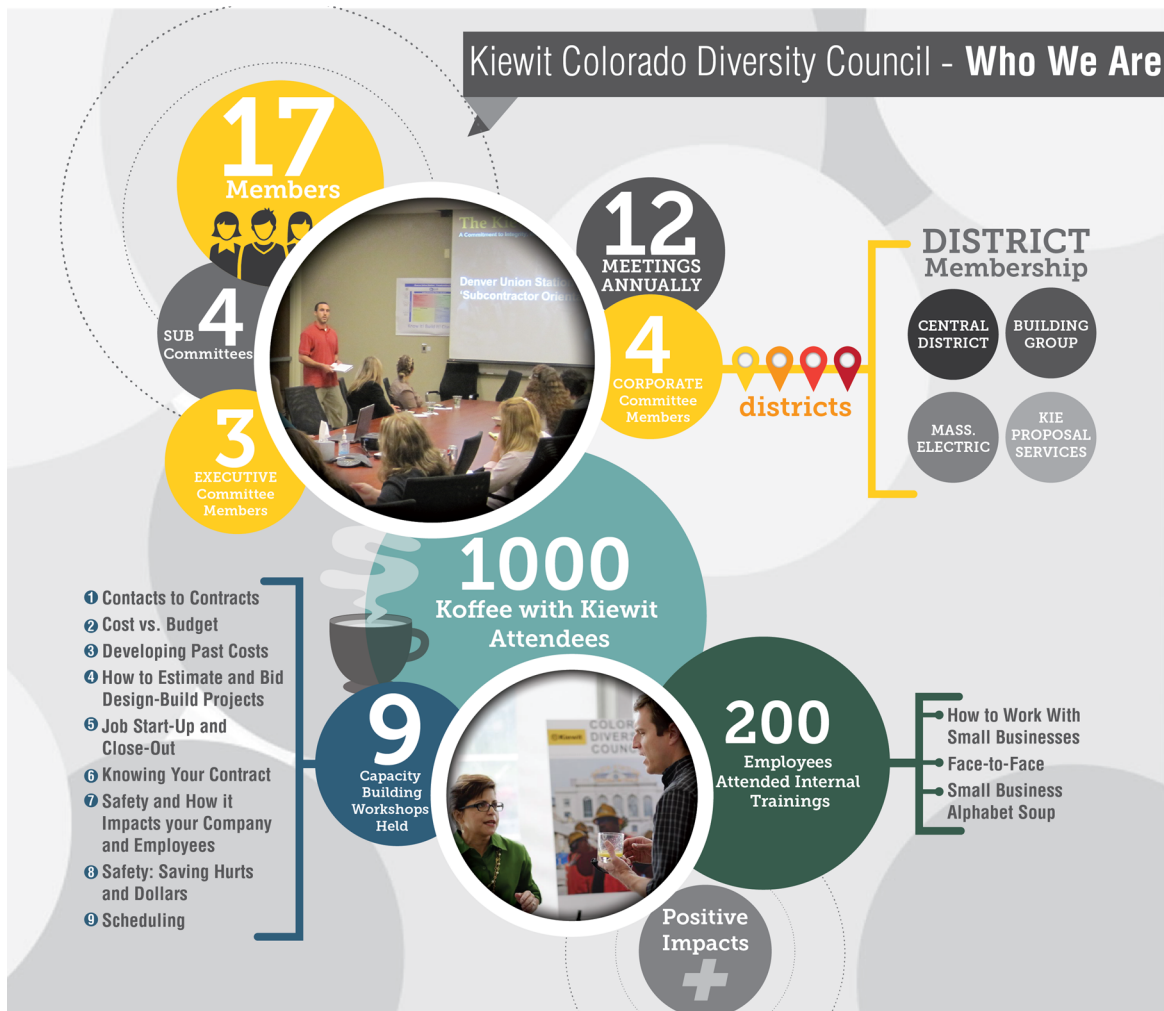
## Kiewit Invests in Small Business Success Through Its Diversity and Inclusion Council

### Kiewit's Diversity & Inclusion Council

Since its inception in 2010, the Diversity Inclusion Council has:

- Developed a comprehensive diversity and inclusion **strategy**
- Served as **liaison** for all business units and projects
- Ensured Kiewit Colorado is on target with all **commitments**
- Enhanced **relationships** within the small business community
- Developed and facilitated **capacity building** workshops

The Diversity and Inclusion program is tied into every project to ensure a consistent approach to small business program management.



### Small Business Support

KMP holds subcontractors accountable for meeting the same safety, quality, schedule, and contract compliance requirements that we demand of ourselves. Although our expectations are



high, we facilitate success by using our in-depth knowledge of capacity-related issues to develop individualized strategies for small businesses. KMP supports DBE/ESB firms through our outreach activities and numerous strategies that mitigate capacity issues and encourage small business success.

### KMP's Mitigation Strategies to Assist Small Businesses

Capacity-Related Challenges	KMP's Mitigation Strategies
<b>Access to Capital</b>	<ul style="list-style-type: none"> <li>• Connect DBE/ESB firms to sources of capital such as the Small Business Administration's loan program and KMP's Revolving Loan Program</li> <li>• Encourage subcontractors to build relationships with DBE/ESB firms to increase participation by DBE/ESB subcontractors and suppliers</li> <li>• Encourage DBE/ESB firms to form teams and pursue larger scopes of work</li> </ul>
<b>Access to Bonding</b>	<ul style="list-style-type: none"> <li>• Leverage Kiewit's involvement in Connect2DOT and the USDOT West Central Small Business Resource Center bonding program where we serve on a panel and give presentations on increasing bonding capacity</li> <li>• Connect small businesses to sureties and participate in the Small Business Administration's Surety Bond Guarantee (SBG) Program</li> <li>• Separate contracts into right-sized increments to allow phased bonding so DBE/ESB firms can build a record of successful bonding and increase bonding capacity</li> </ul>
<b>Access to Required Insurance</b>	<ul style="list-style-type: none"> <li>• Provide financial guidance to DBE/ESB firms to resolve gaps between their insurance coverage and KMP's insurance requirements (to extent it does not impede DBE/ESB firm's CUF)</li> <li>• Connect DBE/ESB firms to highly qualified insurance agencies through contacts gained from active participation/membership in HCC and other organizations</li> <li>• Parsons Brinckerhoff (KMP's Lead Engineer) provides various insurance coverage options to DBE/ESB firms that need assistance bridging gaps where in-house insurance limits do not meet Prime Agreement requirements. Through our subcontractor mentoring program, we coordinate relationships with insurance providers, offer letters of recommendation, or make limited coverage variance exceptions for select DBE/ESB firms.</li> </ul>
<b>Workforce/ Staffing Resources</b>	<ul style="list-style-type: none"> <li>• Utilize the Diversity and Inclusion Council's contacts to help resolve workforce issues</li> <li>• During the pre-bid process, meet with DBE/ESB firms to understand their actual work capacity and workforce availability. Where appropriate, we will unbundle scopes of work to create right-sized bid packages that can be properly bid, staffed, and performed effectively and profitably.</li> <li>• Coordinate with KMP Workforce Development Team to assist with identifying local employees and training providers.</li> <li>• On a monthly basis, use Spanish-language radio and television stations throughout Denver to discuss employment opportunities on the Project (see below for more detail)</li> <li>• Identify current capacity of DBE/ESB subcontractors and monitor progress so they do not exceed capacity</li> <li>• Unbundle scopes of work to 1) create right-sized bid packages that are more feasible for small businesses and 2) provide meaningful opportunities for a larger number of DBE/ESB firms</li> <li>• Identify workforce pool through local business and industry organizations, and construction training facilities like the Colorado Construction Institute and the</li> </ul>



Capacity-Related Challenges	KMP's Mitigation Strategies
	Construction Careers Now program
<b>Mobilization Costs</b>	<ul style="list-style-type: none"> <li>• Provide estimating/bidding training workshops</li> <li>• Assist small businesses in accurately defining and including mobilization costs in their proposal</li> </ul>
<b>Prompt Payment</b>	<ul style="list-style-type: none"> <li>• Comply with prompt payment regulations as Section 17.5 of the Project Agreement requires</li> <li>• Develop case-by-case subcontractor payment options to offset cash flow challenges</li> <li>• Divide contracts into furnish/install units and encourage prompt payment to suppliers</li> <li>• Provide retainage release upon timely completion of the subcontractor's services</li> </ul>
<b>Equipment</b>	<ul style="list-style-type: none"> <li>• Educate on equipment management processes and best practices</li> <li>• Connect DBE/ESB firms to reliable equipment vendors</li> </ul>
<b>Phasing</b>	<ul style="list-style-type: none"> <li>• Communicate detailed phasing plan during the procurement phase so DBE/ESB firms can assess the schedule impacts on their resources and incorporate relevant costs in their bids and submittals</li> <li>• Include DBE/ESB firms and other subcontractors in planning and scheduling efforts related to design or construction phasing requirements to ensure compliance with the critical path activities</li> <li>• Minimize DBE/ESB activity on the critical path to reduce stress on small business capacity</li> </ul>
<b>Dispute Resolution/ Claims Process</b>	<ul style="list-style-type: none"> <li>• Assign subcontractor mentors to support each DBE/ESB subcontractor/supplier</li> <li>• Maintain open communication with DBE/ESB firms through subcontractor mentor to mitigate issues as they arise</li> <li>• Prioritize DBE/ESB issues at DBE/ESB monthly meeting</li> <li>• Engage in regularly scheduled subcontractor forums to identify issues and develop resolution strategies</li> </ul>



## 4.1 CONSTRUCTION WORK

KMP calculates the value of Design Services and Other Construction Work as follows:

- First, KMP establishes the actual dollar amounts of DBE/ESB participation required project-wide.
- These amounts are developed by multiplying the DBE/ESB goal percentages (See chart below for details) by the total value of the Design Services or Other Construction Work as submitted in Form D-8 (Cost Data for Major Components of the Construction Work).

Function	Required Percentages
Design DBE	11.6%
Design ESB	3.0%
Construction DBE	12.5% <sup>1</sup>
Construction ESB	3.0% <sup>2</sup>
<sup>1.</sup> Exclusive of Routine O&M Work <sup>2.</sup> Inclusive of Routine O&M Work	

- These project-wide values are then used to establish subcontractor values, including requirements for utilization of DBE/ESB firms in sub-tier roles. All values are clearly defined in every subcontract. Values are allocated to Design or Construction services where local DBE/ESB firms are available to complete the services in a timely and qualified fashion.
- KMP direct subcontractors, including DBE/ESB subcontractors, are required to submit their sub-tier contracts to the KMP Team for Approval and to confirm compliance with the original subcontract values for DBE/ESB services.
- KMP then monitors monthly progress for all subcontracts and confirms the actual use of Approved DBE/ESB firms. Progress is monitored through monthly reports to ensure that the DBE/ESB firms are performing their intended and functional roles and that monthly payments are on schedule.
- See further clarifications below for DBE/ESB eligibility.

KMP counts eligible participation by DBEs according to 49 CFR 26.55. KMP counts ESB participation similarly, except that ESB firms do not have work codes and, therefore, are not limited to performing work in certain areas.

Performance of Design Services and Other Construction Work performed by DBE/ESB firms count toward achieving these goals; firms that are certified as both a DBE and an ESB, count toward achieving both goals.

KMP complies with requirements outlined in Schedule 15, Federal and State Requirements, Appendix A, Part II, of the Project Agreement regarding commitments and counting procedures for achieving Construction Work Small Business Goals.



## 4.2 ESTIMATED SCHEDULE FOR ACHIEVEMENT OF GOALS

The table below identifies the Project’s DBE/ESB utilization goals based on the projected revenue from our Preliminary Construction Schedule.

**DBE/ESB Goals (% by Year)**

2017	2018	2019	2020	2021	2022
<b>Design</b> 20%	<b>Design</b> 60%	<b>Design</b> 10%	<b>Design</b> 5%	<b>Design</b> 5%	
	<b>Construction</b> 10%	<b>Construction</b> 25%	<b>Construction</b> 30%	<b>Construction</b> 30%	<b>Construction</b> 5%

## 4.3 AREAS OF WORK IDENTIFIED FOR POTENTIAL DBE/ESB PARTICIPATION

The next table highlights potential subcontracting opportunities for DBE/ESB participation. Design for the Project required significant early efforts to develop the RFP submittal and requires an immediate start upon award to achieve the aggressive schedule requirements. To this end, significant outreach, interviews, and selection procedures were performed during the RFP phase to establish the Final Design Team, including many qualified and talented DBE/ESB firms. Those team members are listed below. As Design development progresses and as actual field conditions are obtained, some additional Design services may be required. KMP will fairly assess these additional requirements and look to identify further usage of DBE/ESB designers.

Construction needs and qualified firms to meet those needs change each year. To maintain a current list of certified DBE/ESB bidders, KMP reviews the certified firms on [www.coloradodbe.org](http://www.coloradodbe.org) to confirm availability and encourages those firms to prepare proposals. Some construction activities do not begin until the second, third, or fourth year, while others may continue throughout the duration of the Construction Period. Based on the sequence and phasing of Construction for the Project, opportunities will arise and KMP will encourage DBE/ESB firms to propose in mini-prime roles. This will help expand their management skills, field leadership talents, and bonding capacities.

### Potential Subcontracting Opportunities: DBE/ESB Participation

Areas of Services	
<b>Design Subcontracting Opportunities</b>	
<ul style="list-style-type: none"> <li>• Civil Engineering</li> <li>• Drainage/Erosion Control</li> <li>• Electrical</li> <li>• Environmental</li> <li>• Geotechnical Design</li> <li>• ITS</li> <li>• Laboratory Testing</li> <li>• Landscape and Irrigation Design</li> <li>• Noise Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Pavement Design</li> <li>• Railroad Coordination</li> <li>• Roadway Lighting</li> <li>• Signing and Pavement Markings</li> <li>• Soil Testing and Boring</li> <li>• Subsurface Utility Engineering</li> <li>• Survey/Aerial Mapping</li> <li>• Traffic Control / Traffic Engineering</li> <li>• Utility Design</li> </ul>

## Areas of Services

### Construction Subcontracting Opportunities

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Air Monitoring</li> <li>• Asphalt</li> <li>• Bearings</li> <li>• Cleaning Service</li> <li>• Concrete Accessories</li> <li>• Concrete Barrier</li> <li>• Concrete Forms</li> <li>• Concrete Inspection</li> <li>• Concrete Pumping</li> <li>• Debris Containers</li> <li>• Demolition</li> <li>• Drainage</li> <li>• Electrical Work</li> <li>• Expansion Materials</li> <li>• Fills and Backfills</li> <li>• Flatwork</li> <li>• Fuel</li> <li>• General Tools and Hardware</li> <li>• Grout Injection</li> <li>• HazMat Abatement</li> </ul> | <ul style="list-style-type: none"> <li>• Landscaping</li> <li>• Maintenance of Traffic</li> <li>• Materials</li> <li>• Noise Monitoring</li> <li>• Office Administration</li> <li>• Painting</li> <li>• Precast Concrete</li> <li>• Quality Control</li> <li>• Rebar—Furnish and/or Install</li> <li>• Sawcutting</li> <li>• Security</li> <li>• Signage</li> <li>• Steel</li> <li>• Support of Excavation</li> <li>• Surveying</li> <li>• Temporary Concrete Barrier</li> <li>• Temporary and Permanent Fencing</li> <li>• Traffic and Signals</li> <li>• Trucking and Hauling</li> <li>• Wet and Dry Utility Relocations</li> </ul> |
|---|---|

### Routine Maintenance Subcontracting Opportunities

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Courtesy patrol</li> <li>• Drainage Inspection Cameras</li> <li>• Electrical Work</li> <li>• Hazardous Spill Containment</li> <li>• Heavy Towing</li> <li>• Inspection Services</li> <li>• ITS Maintenance</li> <li>• Routine Landscaping</li> <li>•</li> </ul> | <ul style="list-style-type: none"> <li>• Pavement Markings</li> <li>• Materials</li> <li>• Paving and Pothole Repair</li> <li>• Pump Station Monitoring</li> <li>• Purchasing Services</li> <li>• Snow Removal</li> <li>• Staffing</li> <li>• Sweeping</li> <li>• Traffic Control</li> </ul> |
|--|--|

KMP helps increase the pool of eligible firms by encouraging all DBE/ESB firms to obtain certification in new and advanced North American Industry Classification System (NAICS) codes.

The following table identifies local strategic subcontractors with whom KMP has established agreements for the Project. These firms were selected based upon our outreach events for the



Project and through renewal of historical relationships with firms based on their high-quality performance in the past and proven understanding of our best practices. These firms all bring the same commitment, familiarity with the local environment, and ability to expand relationships with local subconsultants, subcontractors, and suppliers.

**KMP Team's Local, Strategic Partners**

Subconsultants	Subcontractors
Civitas	Anderson Drilling
Clanton and Associates (DBE)	Bilingual Communication Services, LLC (DBE)
Entitlement and Engineering Solutions (DBE/ESB)	Colorado Asphalt and Concrete Inc.
HCL Engineering & Surveying (DBE/ESB)	Hamon Infrastructure
Jacobs Engineering Group, Inc.	Iron Woman (DBE)
Muller Engineering Company, Inc.	JKS Industries (DBE/ESB)
Railroad Coordination, LLC (DBE)	Lawrence Construction
RMC Consultants (DBE)	Sturgeon Electric
Shannon & Wilson, Inc.	Villalobos (DBE)
Shrewsbury (DBE)	
Transtec Group, Inc	
Triunity (DBE/ESB)	

**4.4 INTEGRATING SMALL BUSINESS PARTICIPATION INTO OVERALL SUBCONTRACTING STRATEGY**

KMP Team members have a longstanding record of success with, as well as a commitment to, and sustained investment in, the small business communities within metro Denver and the State of Colorado. Our understanding of the barriers to success for DBE/ESB firms allows us to better integrate small business participation into our overall approach to subcontracting. We make a deliberate and strategic effort to incorporate DBE/ESB firms into our projects, continuing to strengthen relationships with our DBE/ESB partners and identify new DBE/ESB firms.

**4.4.1 COMMUNICATING OPPORTUNITIES**

KMP recognizes the importance of fostering meaningful contracting and employment opportunities throughout the life of the Project. A diverse workforce invigorates the local community, broadens the industry, and benefits the public.

## Koffee with Kiewit



Over the years more than 1,000 people have attended Koffee with Kiewit events to discuss current and future projects with Kiewit staff and representatives from the City of Denver's Office of Economic Development. These outreach events connect DBE/ESB firms, and other local subcontractors, with Kiewit's key decision-makers. This is an excellent opportunity for our designers, estimators, and Management Team to meet and develop strong relationships with small businesses.

The KMP team has been communicating opportunities for contracting and employment in both craft and professional services for the Project over the past two years. Our dynamic Information/outreach team has communicated with the Denver small business community and has encouraged DBE/ESB participation during the following events:

- USDOT Small Business Speed Dialing event: March 21, 2017
- KMP Central 70 Open House: March 15, 2017
- Design Services Open House: March 1, 2017
- Presentation to BCG: January 10, 2017
- Koffee with Kiewit: November 6, 2016
- Presentation to COMTO: September 15, 2016
- Capacity-building seminar: How to Estimate and Bid Design-Build Projects: September 13, 2016
- Koffee with Kiewit and Open House with HCC, Connect2DOT, and the US Small Business Administration: August 16, 2016
- Attendance at USDOT Small Business Services Speed Dating event: March 22, 2016
- Koffee with Kiewit: March 17, 2016
- Joint outreach with the Department: October 22, 2015
- Koffee with Kiewit: June 11, 2015

KMP hosted a Central 70 outreach event on March 15, 2017. Two hundred people attended to meet with KMP Team members, learn about the Project, and hear about KMP's process for procuring Design, subcontracting, or materials. Cathy Kramer from Connect2DOT presented on the certification process and was there to answer individual questions. HCC, COMTO, and USDOT small business outreach were also in attendance to provide information on their support capabilities. Our Outreach Manager, Colean Bemby, and our Design-Build Manager, Tom Howell, described Project Goals, the process for obtaining DBE/ESB certification, and answered questions from participants. KMP staff talked individually with small business representatives and distributed informational brochures, contact information, and instructions for next steps.

Our Small Business Team will continue using a wide range of outreach tools to inform and strengthen relationships with the local business community:



- Providing timely information about bidding opportunities in Design, Construction, or O&M services on our Project-specific website, [www.Kiewitmeridiampartners.com](http://www.Kiewitmeridiampartners.com)
- Continued outreach at public events and Design open house events.
- Posting bulletins on social media to advertise Project information.
- Using [SmartBid.net](http://SmartBid.net) to streamline Project bid documents and other subcontractor communications, to compile DBE/ESB information for opportunities during the Construction Period and Operating Period, and to organize information about all subcontractors and suppliers who have expressed an interest in the Project.



**Kiewit uses Smartbid.net to streamline Project bid data, documents, and other subcontractor communications**

- Using existing databases of DBE/ESB firms that provide trades and services relevant to the Project
- Posting opportunities on a wide variety of media platforms to reach the largest possible audience of interested small businesses
- Emailing advertisements through [SmartBid.net](http://SmartBid.net)
- Advertising to community and industry organizations through:
  - COMTO
  - BCG
  - HCC
  - WTS
  - Denver Metro Small Business Development Center
  - Aurora Small Business Development Center
  - Commerce City Small Business Development Center
  - Colorado Black Chamber of Commerce
  - Denver Hispanic Chamber of Commerce
  - Rocky Mountain Indian Chamber of Commerce
  - Minority Business Development Agency
- Using Connect2DOT, a partnership between the Department and the Colorado Small Business Development Center Network
- Using B2GNow for outreach campaign and event management (to document participation in good-faith efforts)
- Holding outreach events and workshops, and conducting one-on-one discussions at proposal/pre-bid workshops
- Calling, or meeting with, individual DBE/ESB firms to personally encourage participation

Spanish-language radio and television stations throughout Denver create excellent cross-promotional platforms to reach Hispanic subcontractors and suppliers. We use radio programs to publicize opportunities for subcontractors and suppliers, including instructions for contacting our Small Business Team. Further, we also post bid notices in the following locations:

- McGraw-Hill Greensheet
- The Daily Journal
- Open House events
- Project Newsletters
- Community Centers



Beyond outreach to our existing network of small business subcontractors, our team—led by the Small Business Outreach Manager—holds events to generate interest in the Project by DBE/ESB firms new to KMP, gauges local capacity, and obtains information from interested subcontractors and suppliers. Our Small Business Team and other technical staff attend these events, and distribute contact information for various team members to answer any future questions from the DBE/ESB firms.

We ask Design subconsultants, subcontractors and suppliers for qualification information that includes their NAICS codes (DBEs), previous years' revenue, preferred contracting method (Unit Price, Lump Sum, etc.), bonding capacity, and other relevant questions. We use this information to help determine the size of future bid packages. KMP coordinates with small business development centers across the region to identify DBE/ESB firms that are potentially eligible to apply for certification.

#### 4.4.2 CREATING A TRANSPARENT PROCESS

Our approach creates a transparent process focused on frequent conversations with prospective DBE/ESB firms—long before contracts are awarded—so that each firm fully understands the opportunity and our expectations. Outreach events give opportunities to connect with firms with whom we have worked in the past and meet firms that may be new to the KMP Team.

Our O&M Team is integrated in our process, participating in our preconstruction and Construction Period outreach events in order to identify key DBE/ESB firms early. The Small Business Team coordinates with our O&M Team to update the mailing list of DBE/ESB firms based on attendance at these events, one-on-one introductions, and registrations on the KMP website and [Smartbid.net](https://www.smartbid.net).

DBE/ESB firms are registered for their relevant work areas and each will receive appropriate bid packages when issued by KMP. KMP will develop and advertise right-sized bid packages to maximize the number of opportunities, and enable the largest participation from minority firms. When selections have been made, KMP will provide post-selection debriefings and transparent feedback to the DBE/ESB firm on their specific bid with a review of pricing, scheduling, and risk issues that impacted bid selection. Once contracts are awarded, subcontractor selections will be shared.

#### 4.4.3 SECURING DBE/ESB PARTICIPATION

KMP is committed to providing substantial DBE and ESB participation on the Project and will meet, or exceed, the goals established for small and disadvantaged businesses and local workforce participation during Design Services and the Construction Period. KMP's plan for securing DBE/ESB participation will be reviewed regularly for success, and improvements made as necessary. Key elements of the current approach include:

- Continuing to host outreach events with release of bid packages
- Inviting certified DBE/ESB firms to review scope of work, perform quantity comparisons, and ask questions that clarify the bidding process. Although the bidding process does not require attendance at outreach events, we strongly encourage the DBE/ESB firms to attend. Through this early interaction, the firms will ensure full compliance with the bidding requirements, and significantly enhance their opportunity for contract award



- Advising DBE/ESB firms, including one-on-one mentoring sessions, to assist them in acquiring the appropriate insurance policies and bonding limits. KMP will also work with these firms to adjust bid package scopes and schedules to provide right-sized bid packages that offer the greatest opportunity for their participation as well as improving the quantity of available Design subconsultants and subcontractors.
- Requiring all non-DBE/ESB firms to subcontract portions of their work to lower-tier DBE/ESB firms where applicable.

The next table provides additional step-by-step detail for securing DBE/ESB participation on the Project.

Securing DBE/ESB Participation	
1.	Use the Department’s databases and DBE/ESB outreach activities to identify potential DBE/ESB firms
2.	Contact DBE/ESB firms to inquire if interested and request that they submit their qualifications for review
3.	Provide plans and specifications to qualified firms
4.	Meet with all potential proposers/bidders to clarify scope of work
5.	Adjust scope to meet DBE/ESB capabilities
6.	Receive submittals from DBE/ESB firms
7.	Evaluate submittals using qualitative and quantitative factors, to determine the Best Value (BV) bid/submittal
8.	Meet to verify scope of work and pricing
9.	Offer assistance and mentoring
10.	Award contract
11.	Assign a mentor to ensure success

Increasing DBE/ESB participation requires establishing right-sized bid packages that suit the strengths and unique capabilities of potential subcontractors. For example, separating larger scopes of work into smaller—yet still substantial in size—scopes of work, mitigates potential risk to the DBE/ESB firms and encourages DBE/ESB firms to participate in the Project. One bid package could present reinforcing steel into several parts, such as rebar for structures and flatwork. Similarly, the bid package could separate the large amount of drainage work into smaller components to allow DBE/ESB firms to obtain an amount of Work suitable to their capabilities. Also, since the Project requires a considerable amount of hauling, the bid packages could accept concurrent bids from multiple DBE/ESB trucking subcontractors. We use this strategy of multiple subcontractors for concurrent bid packages, as appropriate.



As Design, Construction, and Operations progress, we constantly re-evaluate subcontracting needs and, as unique Project conditions appear, we develop independent bid packages to address those needs. Often, these conditions require the services of specialty firms which align with many of the DBE/ESB companies.

KMP continues to network with subcontractors throughout the entire Project Term to identify new DBE/ESB firms with interest in, and qualifications for, certification.

#### 4.5 MONITORING/TRACKING DBE/ESB PARTICIPATION

Colean Bemby, KMP's full time Outreach Manager, leads a cross-functional Technical Support Team that monitors, reports, and manages our DBE/ESB program. This Small Business Team sustains a strong, constructive working relationship with the Department throughout the Project and maintains accurate, updated records of DBE/ESB participation (including first-, second-, and third-tier subcontractors). KMP tracks and discloses the cumulative value of the Design efforts, Other Construction Work, O&M Services and the value of individual subcontracts on the Project, including the Routine Maintenance services and Renewal Work, according to Schedule 15, Federal and State Requirements.



The KMP team uses B2Gnow software for data collection and reporting. B2Gnow allows KMP to produce real-time participation and prompt payment information on a monthly, weekly, or on-demand basis.

Our team uses InEight Project Suite with a link to B2Gnow software to track Construction Work Small Business Goals and streamline the preparation of Project documentation. A half-million users, including the Department, Denver Public Schools, the City and County of Denver, and Denver International Airport trust B2Gnow software for data collection and compliance reporting. B2Gnow provides accurate, reliable, and timely information on contracts, vendor credentials, and workforce data. B2Gnow accesses every state's Unified Certification Program (UCP), making it a one-stop shop for confirming a DBE certificate. Since B2Gnow requires fewer manual data transfers, it reduces input errors and processing time. Further, B2Gnow stores electronic documents in a central location and organizes them for easy retrieval.

B2Gnow allows us to provide the Department with real-time information regarding DBE/ESB participation. We take the necessary actions to meet, or exceed, DBE/ESB participation goals by:

- Conducting monthly meetings to report DBE/ESB progress
- Modifying scope of work/packaging to increase participation
- Identifying newly-certified DBE/ESB firms
- Identifying future opportunities and additional scopes of work using our revenue-loaded schedule
- Evaluating performance of existing DBE/ESB firms to build capacity

KMP meets Construction Work Small Business Goals using the internal procedures and reporting mechanisms described in the following sections. We will update these procedures and mechanisms after Substantial Completion to ensure the Operating Period goals are met and exceeded.



#### 4.5.1 DISTRIBUTING GOAL RESPONSIBILITIES TO SUBCONTRACTORS

Through outreach events, pre-bid meetings and one-on-one conversations, KMP shares its culture for use of DBE/ESB subcontractors, and the requirements and reporting procedures for the Project. While KMP hires DBE/ESB firms directly, we expect our subcontractors to utilize DBE/ESB firms for their portion of services as well

KMP confirms substantive participation by DBE/ESB firms on the Project by:

- Ensuring our team members meet with their subcontractors and subconsultants to discuss opportunities, bid packages, progress towards goals, concerns, and other relevant items
- Informing subcontractors that use of certified DBE/ESB firms is a key component in bid evaluation
- Confirming that subcontractors and DBE/ESB firms submit required documents
- Reviewing bid submittals from certified DBE/ESB firms
- Verifying DBE/ESB certification and confirming the scope of work reflects the firm's NAICS code area of certification
- Identifying sole-source materials or highly specialized elements of the Work that might limit DBE/ESB participation
- Offering debriefing meetings with our Small Business Outreach Manager and the appropriate Discipline Lead to provide constructive feedback to DBE/ESB firms
- Reviewing and documenting subcontractor efforts to identify and negotiate with DBE/ESB firms, including reasons for final selections
- Maintaining strong documentation and reporting of Project-specific and corporate good-faith efforts used to identify and subcontract DBE/ESB firms, ultimately achieving levels above the Project goals

#### 4.5.2 COLLECTING DATA/CONFIRMING VALID PERFORMANCE

KMP manages and mentors DBE/ESB compliance by:

- Gathering DBE/ESB compliance records from subcontractors. Subcontract mentors are assigned the responsibility for monitoring of these records.
- Performing regular CUF reviews and audits to verify the DBE/ESB firm's performance, management, and supervision to ensure each DBE/ESB firm:
  - Provides an employee to supervise Work activities
  - Performs the Work in a timely manner
  - Owns or leases the required equipment
  - Obtains the necessary materials/supplies
  - Prepares a formal Subcontract Agreement or similar written agreement
  - Avoids acting as a broker
  - Has the opportunity to work for more than one prime contractor
  - Tracks progress and performance of Work
- Attending monthly DBE/ESB compliance meetings with the KMP Team and subcontractors to inform them of current compliance status and deficiencies, and provide recommendations for improvement
- Using B2Gnow for Project documentation and reporting

In the course of tracking and reporting DBE/ESB goals, KMP:

- Develops and maintains a master DBE/ESB database for tracking and reporting purposes
- Reviews DBE/ESB utilization plans for compliance
- Monitors contracts and related documents for compliance with DBE/ESB goals
- Tracks and reviews all contract modifications, change orders, or amendments that impact a subcontractor’s contract value
- Confirms that increases in contract value present additional opportunities for DBE/ESB firms
- Prepares monthly reports indicating DBE/ESB subcontracts, change orders, and payments compared with DBE/ESB goals
- Issues DBE/ESB non-compliance notices and recommendations for improvement or corrective action, if applicable
- Monitors and documents actions taken by non-compliant subcontractors to correct deficiencies

## 5. Approach to Small Business Development and Assistance

KMP desires to consistently strengthen our relationships with DBE/ESB firms, promoting individual opportunity in the short term, and supporting continued success in the long term.

We structure DBE/ESB scopes of work on the Project so that subcontractors can perform services that encompass a variety of Design disciplines or multiple NAICS work codes needed to complete a section or segment of the Project (i.e., a full bridge design or its installation). This effort provides KMP with commercially useful functions and as a mini-prime, it gives a DBE/ESB firm greater responsibilities, and experience, managing a full component of work on time and under budget. A DBE/ESB firm, serving as a mini-prime, increases its small business revenue and diversifies the KMP Project Team. With this effort, the DBE/ESB firm increases their leadership skills and likely requires them to hire and train additional staff, which further benefits the local economy.

The table below highlights the extensive capacity-building, business development, and assistance strategies we use to support DBE/ESB firms.

As a DBE subcontractor on multiple Kiewit projects, St. Andrews Construction participated in capacity-building workshops focused on Kiewit’s safety program and procedures. They also learned to:

- Develop effective schedules, Work Plans, and job hazard analyses
- Submit certified payrolls accurately
- Prepare cost estimates including indirect, general, and administrative expenses
- Perform Work according to Kiewit’s quality program and processes

Kiewit led other technical workshops that expanded the business skills of St. Andrews Construction and other subcontractors, and encouraged them to compete for more extensive scopes of work on larger infrastructure projects.

St. Andrews Construction’s adoption of Kiewit’s safety program and procedures led to an experience modification rating (EMR) of 0.68, which increases their ability to carry appropriate insurance and compete for larger, and more complex, scopes of work on infrastructure projects



## 5.1 CAPACITY BUILDING WORKSHOPS

KMP offers many capacity-building workshops, technical assistance, and Onsite training to help DBE/ESB firms grow their businesses. Past workshop topics include: proposals, design and conceptual estimating, bonding, scheduling, bidding, contracts, cost and budget, marketing, business development, safety, and other topics.

### KMP's Development and Assistance to DBE/ESB Firms

#### KMP's Development and Assistance to DBE/ESB Firms

**Technical:** We provide the following technical assistance:

- ◆ Design discipline techniques
- ◆ 3D/4D Design
- ◆ Design scheduling and project documentation
- ◆ Specification review
- ◆ Plan and bid review
- ◆ Quantity take-off review
- ◆ Materials supply sourcing and pricing schedule analysis
- ◆ Superintendent Do's and Don'ts
- ◆ Foreman Do's and Don'ts
- ◆ Safety/quality program

**Developmental:** We provide developmental assistance through our Subcontractor Performance Enhancement Plan, including:

- ◆ Subcontractor bid debriefing
- ◆ Mentor design firms to support their proposal efforts, project management, and quality control approach
- ◆ Enhancing firm capabilities with submittals, Work plans, scheduling, and compliance reporting
- ◆ Bond and insurance seminar

**Training:** We provide Onsite training, including:

- ◆ Environmental compliance
- ◆ Manpower utilization
- ◆ Certified payroll and daily reports
- ◆ Use of commodity/manhour curves in scheduling
- ◆ Equipment utilization
- ◆ Multiple shift operations
- ◆ Equipment procedures
- ◆ Construction quality control (CQC)
- ◆ Design quality control and quality assurance

KMP continues to offer these workshops throughout the Project, and co-sponsors technical assistance workshops with other organizations to give DBE/ESB firms a competitive edge for future opportunities.

## 5.2 PROMPT PAYMENT TO SUBCONTRACTORS

KMP promptly pays each subcontractor, according to Section 17.5 of the Project Agreement, allowing subcontractors to maintain cash flow for seamless operations. KMP's approach to subcontractor payments includes:

- Evaluating subcontractor invoice schedule to assist with cash flow issues.

- Clearly written agreements identifying which goods and services the subcontractor provides and the amount that KMP pays.
- Providing invoice training at contract signing so that all subcontractors understand what documentation must be submitted for prompt payment.
- Providing clear and concise communications and documentation relative to invoicing.
- Reviewing invoices and identifying issues with each DBE/ESB subcontractor so the subcontractors can make timely corrections and changes, or acquire additional information prior to its formal invoice submittal.
- Monitoring payments to DBE/ESB firms, including comparing contract payments and committed contract values; KMP investigates, reconciles, and reports discrepancies as required.
- Monthly reviews of all unpaid invoices
- Timely evaluation and payment of subcontractor retention values upon completion of their Work. Payments are in full accordance with the Colorado prompt payment obligations and Project Agreement requirements.

#### 5.2.1 ADDITIONAL OPTIONS FOR PROMPT PAYMENT

To facilitate small business participation on the Project, KMP considers the following options for prompt payments beyond those mandated in Section 17.5 of the Project Agreement:

- Accelerating payment, on a case-by-case basis, for small businesses experiencing cash flow or payroll issues
- Writing contracts for materials and labor separately, to reduce bonding costs and requirements
- With Approval of the Department, utilizing joint checks to guarantee prompt payment to suppliers, which builds small business credit and bonding capacity, and prevents delays caused by non-payment to suppliers
- Allowing subcontractors to send invoices more than once a month, which increases monthly cash flow

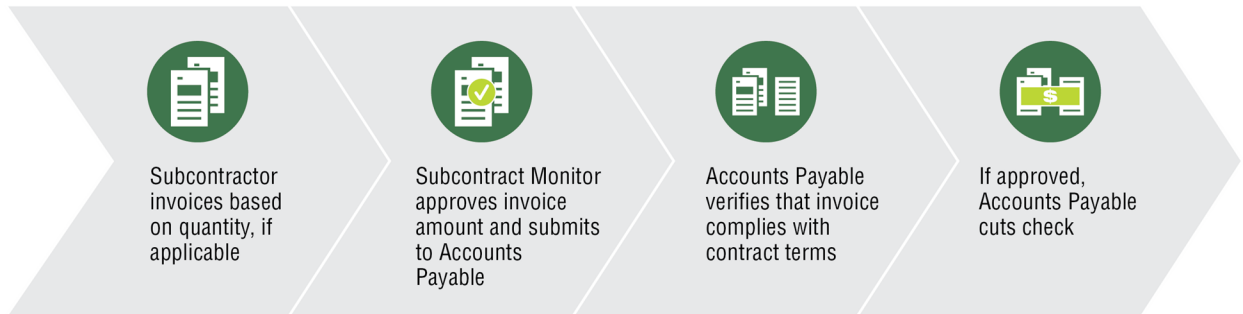
#### 5.2.2 TRACKING AND MONITORING SUBCONTRACTOR INVOICES

We pay subcontractors within 30 days from the receipt of a subcontractor's Approved invoice, and release their retainage upon Acceptance of the subcontractor's relevant scope of work.

Upon receipt of a subcontractor's payment application, we use B2Gnow to confirm and track monthly invoice approvals and payments for all tiers of subcontractors. B2Gnow provides status and reports of all subcontractor payments for review at our monthly progress meetings. At this point, any issues affecting the timely payment of a subcontractor invoice must be addressed and Corrective Action taken.

The next figure illustrates the process that allows KMP to track and monitor subcontractor invoices, provide prompt payments to subcontractors, and release retainage.

## KMP's Process for Approving Subcontractor Invoices



### 5.2.3 ASSISTANCE WITH VIABILITY OF SMALL BUSINESSES

KMP uses the following tools to increase the viability of DBE/ESB firms and encourage small business participation on the Project:

- **Mobilization:** Small businesses often underestimate the costs of mobilizing resources for large infrastructure projects. KMP meets with DBE/ESB firms to discuss appropriate mobilization costs and the process for documenting those costs on a Schedule of Value.
- **Early Purchase of Materials:** KMP expedites the invoicing process to allow early purchase of materials according to Section 109.07; Payment for Material On-Hand, in the Department's *Standard Specifications for Road and Bridge Construction*.
- **Small Business Liaison:** Our DBE/ESB Program Manager and subcontract mentors track, manage, and assist in resolving DBE/ESB firm issues.

### 5.3 ASSISTANCE WITH BONDING AND INSURANCE

KMP identifies insurance and bonding agencies eager to educate small businesses, and increase their access to required coverage. The ability to bond keeps the Project moving, increases the viability of DBE/ESB firms, and builds credit ratings, thereby allowing small businesses to pursue a wider range of future infrastructure projects.

- **Assisting with Insurance Costs:** By complying with KMP's safety program and procedures, small businesses lower their EMR rating and insurance costs. Although KMP does not reduce its insurance coverage requirements, we do work with the DBE/ESB firms to acquire subcontract insurance that will bridge any gaps to meet KMP's contract requirements.

On the design front, Parsons Brinckerhoff (KMP's Lead Engineer) considers various insurance coverage options to DBE/ESB design firms that may need assistance bridging gaps where in-house insurance limits do not meet Prime Agreement requirements. Through our subcontractor mentoring program, we will coordinate relationships with insurance providers, offer letters of recommendation based on past performance or make limited coverage variances for select DBE/ESB firms performing Design support efforts.

- **Connecting DBE/ESB firms to Sureties:** We assist small businesses by connecting them to the US Small Business Administration's Surety Bond Guarantee (SBG) Program, which raises the eligible contract amount (from \$2 million to \$6.5 million), and



guarantees surety bonds for both public and private contracts. We continue to connect DBE/ESB firms to sureties through our involvement in HCC.

- **Phased Bonding:** KMP may offer phased bonding that awards a larger scope of work to a small business but issues multiple Notice-to-Proceed documents for manageable increments of that scope of work.

By maintaining requirements for bonds from all subcontractors and not waiving this protection, the Project's quality, schedule, and payment certainty are maintained. Through KMP's offer to phase a subcontractor's bonding requirements, we allow the DBE/ESB firms to build credit, relationships, and long-term bonding capacity as they successfully complete each increment of the scope of work and dismiss the bond before taking on the next increment.

## 5.4 SMALL BUSINESS OUTREACH, TRAINING, AND DEVELOPMENT

KMP develops and implements programs that increase successful performance of DBE/ESB firms on current projects, and builds capacity for future, larger infrastructure projects. The next sections describe the integrated and multi-faceted approach that KMP uses throughout the Project.

### 5.4.1 OUTREACH EVENTS PRIOR TO THE ISSUANCE OF NTP2

KMP has sponsored numerous outreach events for the proposal and procurement phase of the Project. These events have generated substantial interest in the Work, and KMP will use these introductions to request early Project services from small businesses.

Major areas of Work early in the Project include:

- Design
- Mobilization
- Tenant Improvements of Construction Offices
- Trucking
- IT Networks
- Food Services

KMP will host an outreach prior to the issuance of NPT2 to supplement the outreach events we have hosted since 2015. At these outreach events, the KMP Team introduces themselves and the Project, provides a Project timeline, and describes the entire subcontracting process. The outreach event allows DBE/ESB firms to meet with Discipline Leads and discuss specific opportunities. Our Koffee with Kiewit events highlight the benefits to small businesses of networking with industry professionals who can answer questions, assist with the certification process, or address other issues.

### 5.4.2 CONNECT2DOT OUTREACH

During the pre-bid period, we placed a link on the KMP website to Connect2DOT, which provides quick electronic access for small business training opportunities and services. We continue to invite Connect2DOT representatives to the Koffee with Kiewit events for networking opportunities between Connect2DOT and small businesses. Further, Kiewit continues to support Connect2DOT by participating in their outreach efforts to large and small businesses. At our KMP outreach event on March 15, 2017, Kathy Kramer from Connect2DOT was part of our presentation, describing the different certifications and how to get certified. She also had an information table and spoke one on one with numerous firms.

### 5.4.3 CONNECT2DOT'S LEADING EDGE FOR TRANSPORTATION AND CONSTRUCTION PROGRAM

KMP regularly participates in Connect2DOT's Leading Edge for Transportation and Construction program on technical panels, training seminars, and special events, including the Kiewit Networking Dinner and Capacity-Building Workshop.

KMP assists with the Leading Edge for Transportation and Construction Program by developing a course curriculum and providing technical experts in strategic planning, construction accounting, marketing, estimating and bidding, and project management. We lead training programs on a variety of subjects at the HCC Contractor Academy, and collaborate with Connect2DOT to identify additional training needs and instructional staff for customized training classes with the Small Business Collaborative Forum.



### 5.4.4 SMALL BUSINESS MEETINGS

KMP participates in the Department's quarterly Small Business Collaborative Forums and presents Project updates at the monthly meetings of other small business organizations. Our participation in HCC, COMTO, BCG, WTS, and many other industry organizations allows us to widely distribute Project information. We use social media, the KMP website, and Spanish-language radio and television stations throughout Denver to promote the Project and distribute information. We continue to be a leading participant in the HCC/BCG/CDOT Joint Transportation Committee, which Kiewit founded with Helga Grunerud, the Executive Director of the HCC.

### 5.4.5 CONNECT2DOT NEWSLETTER

Every month, KMP provides a list of upcoming subcontracting opportunities and events for publication in Connect2DOT's monthly newsletter. We forward the Connect2DOT newsletter to our contacts for the broadest distribution. KMP distributes a separate DBE/ESB monthly electronic newsletter with information on upcoming subcontracting opportunities plus local events and training seminars.

### 5.4.6 RESOURCES FOR OUTREACH, TRAINING, AND DEVELOPMENT

KMP and its team members have invested significant hours during the pursuit of this Project, as well as over the past 10 years, to expand our outreach efforts and training for small businesses in the Denver area. As listed in Section 4.4,1, we have developed and hosted numerous events, including Koffee with Kiewit, community outreach, and Capacity Building workshops. We also maintain active memberships and leadership participation in local organizations to share our knowledge and to enhance relationships, confidence, and trust between our companies and DBE/ESB organizations.

Another key element of our community outreach, KMP Team members speak frequently to representatives of area colleges and community colleges regarding internship



opportunities for students enrolled in design and the Construction Management Technology program. We participate with the schools through internships, career fairs, as guest lecturers, and as hosts during Project site visits for groups of students. These relationships have several benefits:

- The KMP Team meets bright, energetic students from the local area to help with the Project and for future employment opportunities in the design or construction fields
- Local students get valuable, hands-on experience in the management of a major infrastructure project
- Both groups expand their networks and relationships

Kiewit and Parsons Brinckerhoff also visit K-12 schools and youth organizations to support expansion of STEM education. We hope talking to these students at an early age will cultivate their interest in engineering and construction-related professions, including the tremendous growth opportunities for women and minorities in these fields.

#### 5.4.7 OTHER ACTIVITIES

We leverage our relationships with HCC, COMTO, WTS, BCG, and other industry organizations to identify new and emerging DBE/ESB firms. Continuing outreach efforts, updating technology, and maintaining a wide network of established relationships in the community allows us to communicate with known DBE/ESB firms, and identify new DBE/ESB firms as additional scopes of work become available.

We also conduct the following activities related to achieving Construction Work Small Business Goals:

##### 5.4.7.1 Mentoring and Coaching

KMP believes that our day-to-day interactions with subconsultants, subcontractors, and suppliers provide informal mentoring opportunities. KMP provides an orientation meeting for DBE/ESB firms before they begin working on the Project. The orientation meeting discusses administrative obligations, KMP's expectations, and appropriate contacts for various document submissions. As part of the orientation process, KMP trains DBE/ESB firms on reporting requirements, B2Gnow for payment reporting, LCPtracker for certified payroll submissions, and compliance with Davis-Bacon and Related Acts (DBRA).

KMP assigns a subcontractor mentor to support each DBE/ESB firm. The subcontractor mentor is a Discipline Lead or engineer with experience working effectively with small businesses, and knowledge of tracking and reporting requirements. The subcontractor mentor assists DBE/ESBs with the Project Agreement, Department standards, safety requirements, quality requirements, environmental commitments and ROD mitigation measures, Work plan creation and execution, quantity tracking, payment requests, and issue resolution. The subcontractor mentor also tracks DBE/ESB performance and offers guidance when needed.

KMP requires at least one representative from each DBE/ESB firm to attend various meetings and development sessions, such as safety meetings and Play-of-the-Day Meetings.



### 5.4.7.2 Safety, Quality, Environmental, and Compliance Training

KMP provides subcontractors with appropriate compliance, safety, quality, and environmental training. KMP expects subcontractors to maintain KMP's high standards, and we schedule compliance training and other Site-specific topics that offer support to subcontractors throughout the Project:

- **Compliance**
  - Overview of the Project Agreement, including the DBE/ESB programs
  - On-the-job training
  - Title VI/Limited English Proficiency (LEP)/Environmental Justice (EJ)
  - 1099 Fraud
  - Workers Compensation
  - OSHA 10
  - Workplace discrimination
  - Prevailing wages
- **Safety**
  - Proper lifting/crush points
  - Fall protection
  - OSHA requirements
  - Preparation of Job Hazard Analysis
  - Confined space
  - Railroad safety
  - Excavation and Lowered Section safety
  - General work zone safety
  - Material safety data sheets
- **Quality**
  - Quality inspection and hold points
  - Specification reviews
  - Checklists
  - Preconstruction meetings
  - Pre-Activity Meetings (Play-of-the-Day)
  - KMP Quality Management Program
- **Environmental**
  - Understanding ROD commitments
  - Protecting wildlife species
  - Spill prevention and mitigation
  - Using Stormwater Pollution and Protection Plan/BMPs
  - Hazardous Materials

### 5.4.7.3 Skills Expansion

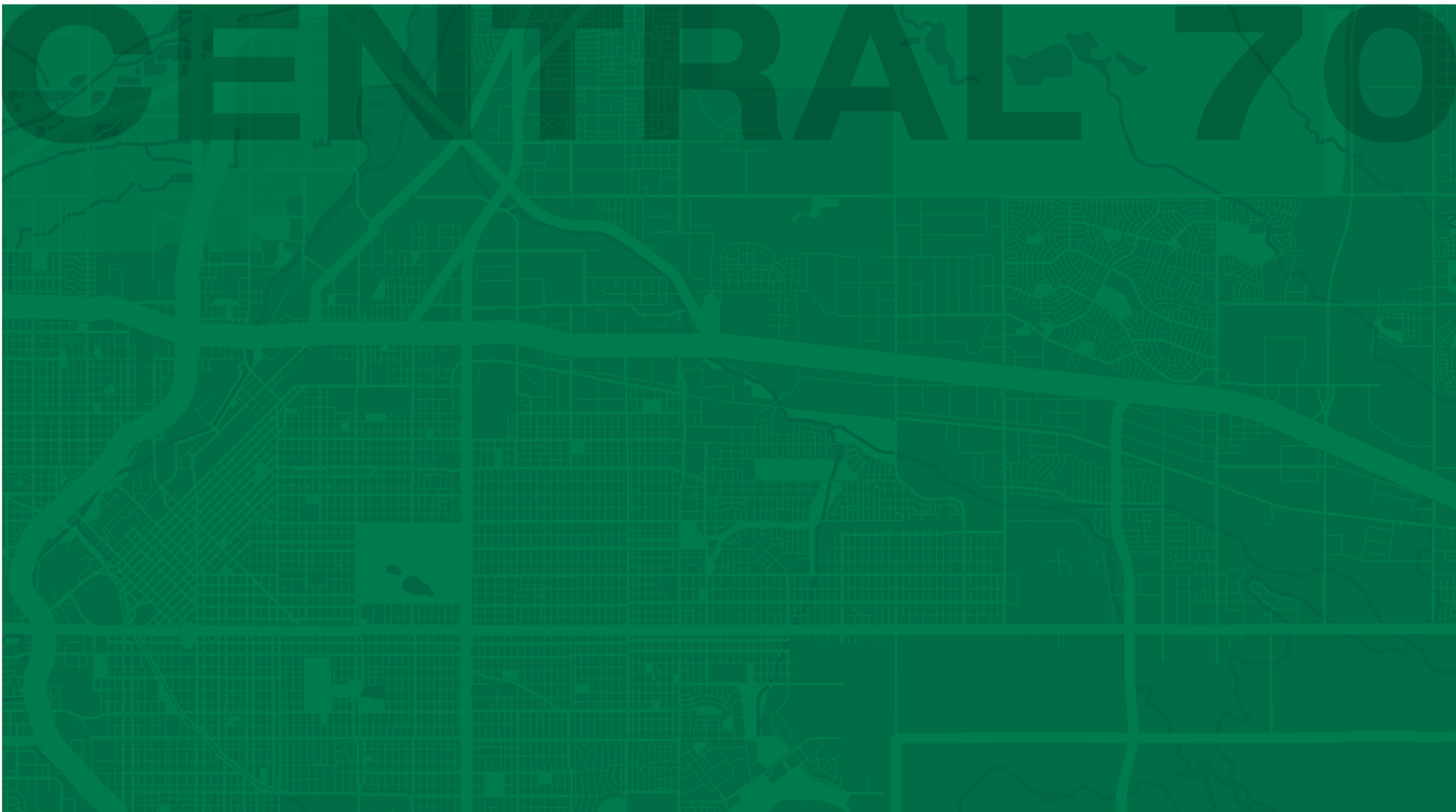
We know that a vibrant economy requires strong and growing businesses. Helping DBE/ESB firms to acquire new skills and expand experiences with different complexities of Work increases their viability as a small business and heightens their competitive position. KMP assists subcontractors by awarding Project Work that is similar to, or a natural progression from, tasks that the DBE/ESB firm has successfully performed in the past (as long as the scope of work is consistent with the DBE/ESB certification assigned/Approved for the firm).

#### **5.4.7.4 Certification**

KMP supports efforts to increase the number of DBE/ESB firms by encouraging and assisting eligible firms to become certified. Our efforts include referring firms to local certifying agencies and associations, such as Connect2DOT, which can assist with the application process, as well as educating firms on the appropriate NAICS codes relevant to the Project.

#### **5.4.7.5 Scholarships to the HCC Contractor Academy**

KMP supports the HCC Contractor Academy by providing educational opportunities and scholarships so that personnel from small construction-related businesses have access to inexpensive training that can enhance their careers in the construction industry. Participation in the HCC Contractor Academy increases business development opportunities, increases the number of qualified, local, DBE/ESB firms, and provides access to leading industry partners.



# APPENDIX L

*Relates to Part 4, Volume 2*



# Draft Workforce Development Plan



**SUBMITTED TO:**  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



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## SIGNATURE PAGE: APPENDIX L

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PROJECT MANAGER

DATE

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CIVIL RIGHTS PROGRAM MANAGER

DATE

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DESIGN-BUILD MANAGER

DATE

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OPERATIONS AND MAINTENANCE MANAGER

DATE

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DESIGN MANAGER

DATE



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## RECORD OF REVISIONS

Revision number	Date issued	Pages affected	Comments
0	5/18/2017	All	Proposal Draft Submittal





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## ATTACHMENTS

- **Attachment 1:** Colorado Recruitment Sources



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## EVALUATION CRITERIA – APPENDIX L, VOLUME 2

The following Evaluation Criteria Matrix aligns the requirements for the Workforce Development Plan (WDP) in the Project Agreement with the sections of this plan.

Sch. 15, Appendix B, Part 1 Section	Item	WDP Section	Section Name	Check
<b>The WDP shall at a minimum include the following elements:</b>				
<b>1.0</b>	<b>General Plan Requirements</b>	<b>2.1</b>	General Plan Requirements	<input type="checkbox"/>
	a. A written statement indicating the Developer’s commitment to achieve the Construction Period OJT Goal and the Local Hiring Goal.	<b>2.1.1</b>	Commitment	<input type="checkbox"/>
	b. A description of the CRPM and other team members responsible for implementing the Developer’s WDP, including the name of each team member, a description of their workforce development experience, and a description of their roles and responsibilities on this Project.	<b>2.1.2</b>	CRPM and Team	<input type="checkbox"/>
	c. A description of how the Developer and all Subcontractors will recruit their workforce, including planned outreach events involving the local community. The Developer shall describe how it will work with CDOT-approved workforce development organizations to advertise job openings locally.	<b>2.1.3</b>	Workforce Recruitment	<input type="checkbox"/>
	d. A description of how the Developer plans to utilize Subcontractors to achieve the Construction Period OJT Goal and Local Hiring Goal.			
e. A description of how the Developer plans to utilize high school outreach programs such as Denver Public Schools Career Connect and Arrupe Jesuit’s Corporate Workforce Program to staff administrative, internship, or other opportunities.			<input type="checkbox"/>	
<b>2.0</b>	<b>On-The-Job-Training Plan: with respect to OJT:</b>	<b>3.0</b>	On-The-Job Training Plan	<input type="checkbox"/>
	a. Identification of the number and description of the skilled craft areas where trainees and apprentices will be used during the Construction Period on Other Construction Work.	<b>3.1</b>	Skilled Craft Areas	<input type="checkbox"/>
	b. The minimum length and type of training that will be offered for each position.	<b>3.2</b>	Apprenticeship Programs	<input type="checkbox"/>

## EVALUATION CRITERIA: APPENDIX L, VOLUME 2

Sch. 15, Appendix B, Part 1 Section	Item	WDP Section	Section Name	Check
	c. A description of how the Developer will monitor hours completed, training provided, and how the Developer will alleviate barriers to employment, graduation and successful permanent placement.	3.3	Monitoring the OJT Plan	<input type="checkbox"/>
	f. A description of the Developer's approach to graduating participants. The Developer shall identify a target number of graduates in order to maximize participant graduation rates from the pre-approved trainee/apprenticeship programs during the Construction Period.	3.4	Approach to Graduating Participants	<input type="checkbox"/>
	g. An annual schedule indicating the distribution of training hours over each Contract Year for the duration of the Construction Period.	3.5	Annual Schedule of Training Hours	<input type="checkbox"/>
	h. The Developer shall describe recovery tools and methods that will be implemented should appropriate progress not be made toward the overall goal attainment.	3.6	Recovery Tools/Methods	<input type="checkbox"/>
	<b>Local Hiring Plan: With respect to local hiring:</b>	5.0	Local Hiring Plan	<input type="checkbox"/>
3.0	a. Strategic approach for meeting the Local Hiring Goal, including the identification of jobs targeted for recruitment, the estimated length of employment associated with identified jobs, and an estimated schedule of the distribution of hours for the Construction Period.	5.1	Strategic Approach for Meeting the Local Hiring Goal	<input type="checkbox"/>
	b. A description of how the Developer shall provide assistance to prospective and actual local employees to alleviate barriers to employment and to promote retention.	5.2	Assistance to Prospective/Actual Local Employees	<input type="checkbox"/>
	c. A description of how the Developer shall monitor and track hours worked and of the internal procedures through which the Developer will ensure the Local Hiring Goal will be met. This will include distribution of the goal responsibilities to Subcontractors, collecting data on Subcontractor participation and performance, and ensuring only valid participation is counted.	5.2.1	Monitoring and Tracking Hours	<input type="checkbox"/>
	d. A description of how the Developer plans to ensure compliance with the residency requirements in Section 2 of Part III of this Appendix B for workers that will count toward the Local Hiring Goal.	5.3	Confirming Compliance with Residency Requirements	<input type="checkbox"/>

## EVALUATION CRITERIA – APPENDIX L, VOLUME 2

Sch. 15, Appendix B, Part 1 Section	Item	WDP Section	Section Name	Check
	e. An affirmative statement that no existing employees of the Developer or any Subcontractor will be displaced or have their employment terminated as a result of the Local Hiring Goal.	5.4	Affirmative Statement	<input type="checkbox"/>
4.0	<b>Plan Updates.</b> The WDP is intended to be a living document and shall be updated or revised as necessary during the course of the Construction Period, including as requested by the Department. At a minimum, an update of the WDP shall be submitted to the Department for Approval no later than 30 Calendar Days prior to the commencement of each Contract Year.	2.1	General Plan Requirements	<input type="checkbox"/>



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# 1. Project Summary

## 1.1 KIEWIT-MERIDIAM PARTNERS CORE VALUES

Kiewit-Meridiam Partners (KMP) is committed to delivering the Central 70 Project (Project) with a focus on client relations, achieving the Project goals, and maintaining transparency with the Department. To achieve these objectives, the KMP Team has adopted the following core values:

### KMP Core Values

Every day we strive to fulfill our role as stewards in our communities—after all, we work in our own backyards.

#### STEWARDSHIP



#### PEOPLE

We are relentless in our ongoing focus that *Nobody Gets Hurt*. We hire bright minds that are hungry for the best training available and committed to Team success.



**KMP's four core values form the cornerstone of our company and the sum of our business ethics conduct. We train on these values so that they are constantly on the minds of our leaders and workforce.**



#### INTEGRITY

We conduct ourselves with the highest levels of integrity. We are responsible, accountable, honest, straightforward, and deal fairly with everyone.



#### EXCELLENCE

We focus on quality production, commit to excellence, and encourage new and innovative ideas. We build our work *Right First Time*.



### 1.2 PLAN MANAGEMENT

This Project summary is presented at the start of each Appendix to serve as a quick reference to our core values, the Project overview, our Team’s composition, and our Key Personnel and Critical Staff. We developed each Appendix to demonstrate our understanding of the Project requirements and facilitate timely Approval by the Department after award.

This document describes KMP’s approach for the Work. KMP resubmits this Plan, including an updated Project summary, to the Department as required per the Project Agreement.

All Project plans, including this document, are stored electronically per KMP’s Document Control System (DCS) Plan. Revisions to these documents may be required as the Project progresses, and annual updates are completed in accordance with Section 4.2 of the Project Management Plan (PMP). The latest revision of all Management Plans are be stored per KMP’s DCS and submitted to the Department through Aconex.

### 1.3 OVERVIEW

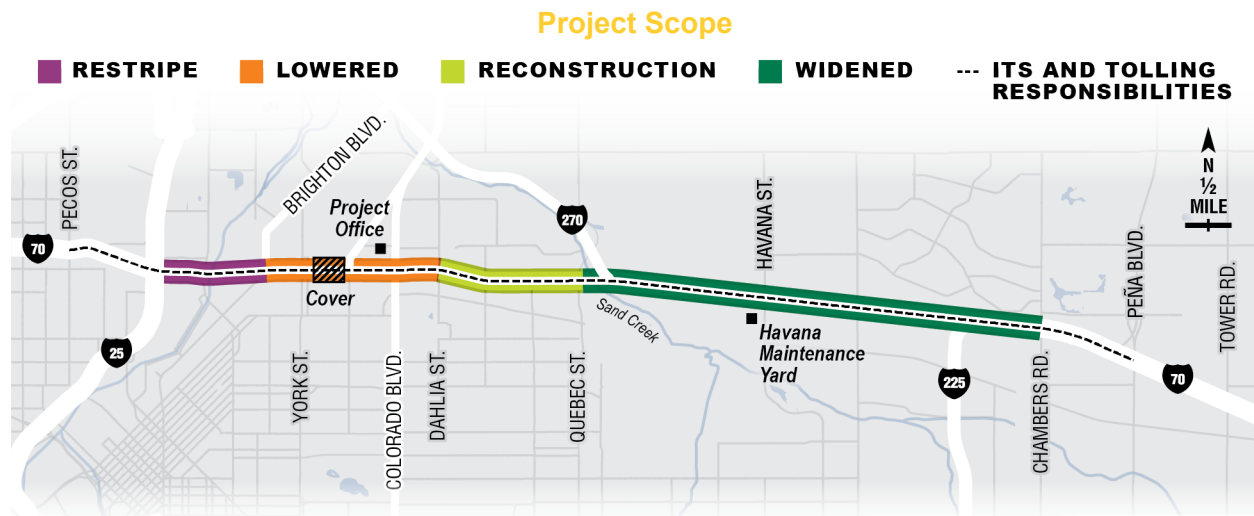
The Project is a Public-Private Partnership to design, build, finance, operate, and maintain planned improvements to the I-70 corridor between I-25 and Tower Road.

The Project’s scope is broken down into the following timeframes:

#### Project Time Frames

Time Frame	Period	Description	Estimated Duration
Notice of Award to NTP1	Submittals	Plan development, submittals, and mobilization of Quality Management staff	3 months
NTP1 to NTP2	Construction	Financial Close and Design	6 months
NTP2 to Substantial Completion	Construction	Construction and O&M During Construction (other than snow and ice control services)	45 months
Pre-Substantial Completion to Substantial Completion	Transition	Transition from Construction to Operating Period, and O&M submittals	8 months
Substantial Completion to Final Acceptance	Operating	Final submissions and inspections	4 months
Substantial Completion to Expiry Date	Operating	Operations and Maintenance (including Renewal Work)	30 years
NTP3 to Term	Construction, Operating	KMP snow and ice control services	33-34 years
62-68 months prior to Expiry Date	Operating	Handback Inspections, Handback Work, and Department training to facilitate seamless handover at Expiry Date	62-68 months

Improvements made by KMP during the Construction Period, highlighted in the figure, are described below.



### 1.3.1 RESTRIPE: I-25 TO BRIGHTON BOULEVARD

Restriping I-70 from I-25 to Brighton Boulevard to accommodate one managed lane in each direction, including:

- Design and Construction for improvements to associated drainage infrastructure

### 1.3.2 LOWERED: BRIGHTON BOULEVARD TO DAHLIA STREET

Full reconstruction of I-70 between Brighton Boulevard and Dahlia Street, including:

- Removing the viaduct between Brighton Boulevard and Colorado Boulevard, and reconstructing the Interstate below grade to accommodate the Ultimate Project roadway configuration and associated elements
- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing the Interstate structures over Brighton Boulevard
- Constructing the Cover and associated elements over the Interstate between Columbine Street and Clayton Street
- Constructing cross-street structures at York Street, Josephine Street, Columbine Street, Clayton Street, Fillmore Street, Steele Street/Vasquez Boulevard, Cook Street, Monroe Street, and Colorado Boulevard
- Constructing I-70 Mainline structures at Dahlia Street
- Removing one Railroad structure, and Constructing two Railroad structures at Union Pacific Railroad (UPRR) and BNSF Railway (BNSF)

### 1.3.3 RECONSTRUCTION: DAHLIA STREET TO SAND CREEK

Full reconstruction of I-70 Mainline between Dahlia Street and Sand Creek, including:



- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing Interstate structures over Holly Street, Monaco Street, Denver Rock Island Railroad, and Quebec Street

#### 1.3.4 WIDENED: SAND CREEK TO CHAMBERS ROAD

Widening I-70 from Sand Creek to Chambers Road with associated elements, including:

- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing the I-270 flyover structure to I-70 eastbound
- Removing and replacing Interstate structures over Peoria Street

#### 1.3.5 INTELLIGENT TRANSPORTATION SYSTEMS (ITS) AND TOLLING RESPONSIBILITIES

Additional ITS and tolling responsibilities, including:

- Closed circuit television (CCTV) camera coverage for I-70 corridor, including interchanges between Pecos Street and Airport Boulevard
- Microwave vehicle radar detection between Pecos Street and Tower Road
- Travel time indicators between Pecos Street and Tower Road
- Lane use signals between Pecos Street and Chambers Road
- Dedicated short range communications radios between Pecos Street and Tower Road

#### 1.3.6 OPERATIONS AND MAINTENANCE (O&M) WORK DURING CONSTRUCTION

Operations and maintenance of existing infrastructure within the O&M Limits During Construction as defined by the Project Agreement, including:

- I-70 Mainline and associated infrastructure
- Local Agency infrastructure
- Drainage
- Water quality
- ITS and electronic toll collection facilities
- Utility services
- Traffic signals and lighting
- Railway structures
- Fencing
- Snow and ice control services (following NTP3)

#### 1.3.7 OPERATIONS AND MAINTENANCE WORK DURING THE OPERATING PERIOD

Operations and maintenance of I-70 within the limits defined by Schedule 11 of the Project Agreement for the Operating Period (dashed line in figure above), including:

- Providing resources to safely maintain the roadway throughout the Term

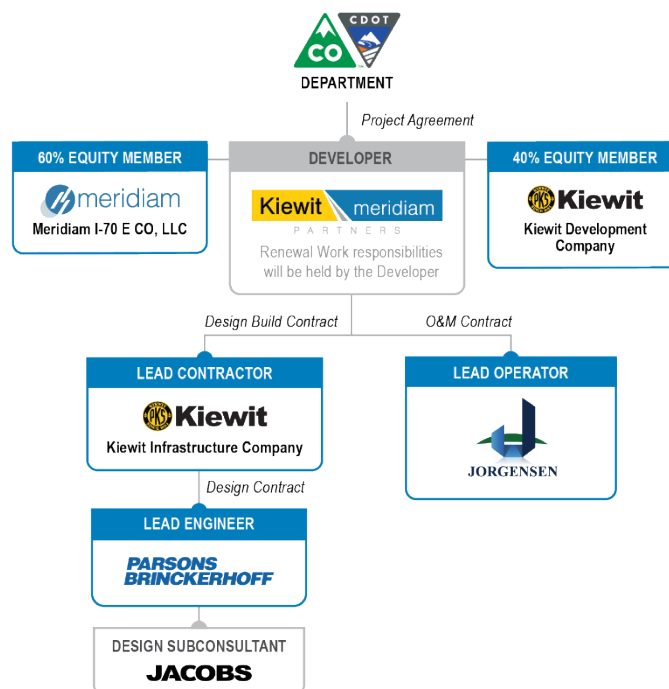
- Asset preservation including repair and Renewal
- Snow and ice control services
- Courtesy patrols
- Incident response
- Meet Handback requirements

### 1.4 KIEWIT-MERIDIAM PARTNERS COMPOSITION

KMP organized a streamlined Team to successfully deliver the Central 70 Project. The Core Proposer Team Members of Meridiam, Kiewit, Parsons Brinckerhoff, and Jorgenson are united by a commitment to Project success under a common project management system. KMP’s lean approach has been cultivated from a history of working together, and by our shared cultures of safety, quality, environmental stewardship, and community service. The KMP Team needs no learning curve to start working together, and is positioned to execute on our joint Project delivery commitments from day one.

KMP’s equity members—Meridiam and Kiewit Development Company—formed KMP for the sole purpose of developing this Project. KMP’s Core Proposer Team Members, shown below, include Kiewit Infrastructure Company (KIC) as the Lead Contractor, Roy Jorgensen Associates (Jorgensen) as Lead Operator, and Parsons Brinckerhoff (PB) as Lead Engineer. Our Team is supported by the expertise of subconsultants and subcontractors who possess additional local knowledge and experience, including Jacobs as PB’s main Design subconsultant. KMP is committed to identifying opportunities to maximize the involvement of small and disadvantaged businesses. Throughout the Project, KMP remains the single point of responsibility for meeting all Project Agreement requirements.

KMP co-locates with the Department in both the Project Office and the Colorado Transportation Management Center (CTMC) to foster a collaborative approach that ensures we meet the Department’s Project goals throughout the Project.





### 1.5 KEY PERSONNEL AND CRITICAL STAFF

The table below shows KMP’s Key Personnel overseeing the Project. KMP has also identified positions, and individuals, as Critical Staff who are instrumental in the successful delivery of the Project.

#### Key Personnel and Critical Staff

Staff Type	Title	Name	Employed by	Seconded to
KEY PERSONNEL	Project Manager	Chris Hodgkins	Meridiam	KMP
	Design-Build Manager	Tom Howell	KIC	
	Construction Manager	Barry Thoendel	KIC	
	Design Manager	Doug Andrew, PE	PB	
	O&M Manager	Abraham Henningsgaard, PE	Jorgensen	
	Project Quality Manager	Gordon Peterson, PE	KIC	KMP
	Independent Design Quality Manager	Ina Zisman, PE	PB*	
	Construction Process Control Manager	Sean McAfee	KIC	
	Independent Quality Control Manager	Tracy Martin, PE	KIC*	
	Environmental Manager	Jenn Bradtmueller, PE	KIC	KMP
	Utilities Manager	Kevin Custy	Jacobs	KIC
	Project Communications Manager	Hunter Sydnor	KIC	KMP
CRITICAL STAFF	Technical Manager	Martin Currie	KDC	KMP
	Financial Manager	Christopher Couallier	Meridiam	KMP
	Safety Manager	Ben Snow	KIC	KMP
	Construction Safety Manager	Kenyon Manley	KIC	
	Civil Rights Program Manager	Matt Christensen	KIC	
	DBE/ESB Program Manager and Outreach Training Manager	Colean Bembry	KIC	
	Lead Scheduler	Mauricio Solano	KIC	
	Design Integration Manager	Tim Nelson	KIC	
	Deputy Design Manager	Mark Talvite, PE	Jacobs	
	Cover Design Manager	Heath Therrien, PE	PB	
Commercial Manager	Jamie Harvey, PE	KIC		

*\*Per Approved ATC 9.1 (see Attachment to the Quality Management Plan), KMP shall use in-house personnel in lieu of employees from an Independent Quality Control Firm*

## 2. Workforce Development Plan

KMP is committed to developing new skills, creating jobs, and expanding local hiring programs in the design and construction industry. Our Team Members have a major presence in the Denver community, and we are well positioned to train existing, and new, workers in the professional services and skilled crafts needed for this Project. KMP has a comprehensive Workforce Development Program that is engaging for the entire community.

### 2.1 GENERAL PLAN REQUIREMENTS

KMP forwards a Workforce Development Plan (WDP) to the Department for Approval prior to the issuance of NTP1. The WDP is a document that KMP updates or revises, as necessary, during the Construction Period, or at the Department's request. At a minimum, KMP submits an updated version of the WDP to the Department for Approval no later than 30 Calendar Days prior to the start of each Contract Year.

#### 2.1.1 COMMITMENT

KMP Team members have a proven record of meeting and exceeding Workforce Development goals on large, complex infrastructure projects—both locally and nationally. The nature of this Project, and the commitment from KMP Executive Management, provides us with an excellent opportunity to build upon an exceptional record of accomplishment for Workforce Development Programs.

During the Construction Period, we are committed to meet, or exceed, the On-the-Job Training (OJT) and Local Hiring goals identified in Schedule 15, Federal and State Requirements of the Project Agreement.

#### 2.1.2 CRPM AND TEAM

KMP's Civil Rights Program Manager (CRPM), Matt Christensen, is responsible for Civil Rights Requirements throughout the Construction Period. Matt brings 30 years of professional experience working alongside our Senior Management Team on transportation-related construction projects throughout Colorado. Matt has a thorough understanding of small business procedures, workforce regulations, and best practices to comply with all Civil Rights Requirements.

The organizational chart and table below identify the members of our Workforce Development Team, and summarize the Team's roles and responsibilities on this Project.

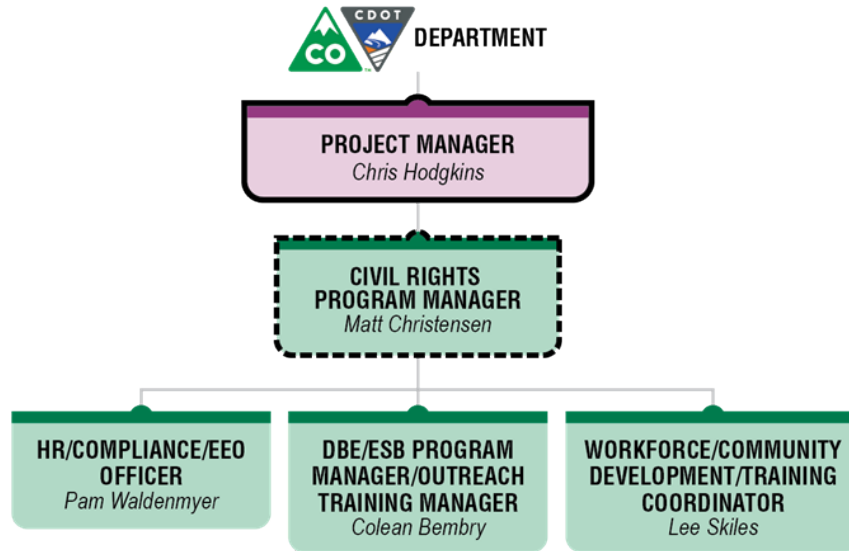
Prior to Substantial Completion, KMP identifies the individual responsible for Civil Rights Requirements for the Operating Period, and apprises the Department of any changes during the remaining Term.





### Workforce Development Organizational Chart

Key Personnel    
  Critical Staff    
  Developer    
  Commercial



### Workforce Development Team Members: Experience, Roles, and Responsibilities

Role	Responsibilities
<div style="background-color: #006633; color: white; padding: 5px; transform: rotate(-90deg); transform-origin: left top;">Matt Christensen</div>	<div style="text-align: center; margin-bottom: 10px;"> <b>Civil Rights Program Manager</b> </div> <ul style="list-style-type: none"> <li>• Reports to the Project Manager</li> <li>• Directs day-to-day operations of the Small Business Team</li> <li>• Coordinates Civil Rights efforts with other Key Personnel for Design, Construction, and O&amp;M services</li> <li>• Confirms compliance with:               <ul style="list-style-type: none"> <li>○ Davis-Bacon and Related Acts (DBRA)</li> <li>○ Federal Aid Construction Contracts, Form FHWA 1273–Schedule 15.1.1.1.e</li> <li>○ Equal Employment Opportunity</li> <li>○ Title VI of the Civil Rights Act</li> <li>○ Americans with Disabilities Act</li> <li>○ Small business participation and workforce development</li> <li>○ Community development programs</li> </ul> </li> <li>• Confirms compliance by all subcontractors</li> </ul>

	Role	Responsibilities
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Colean Bemby</p>	<p><b>DBE/ESB Program Manager</b></p>	<ul style="list-style-type: none"> <li>• Reports to the CRPM</li> <li>• Communicates identified needs of the small business community to Design-Build Manager and Commercial Manager</li> <li>• Communicates with small business community regarding schedules for bid submittal packages</li> <li>• Coordinates with the Project Communications Manager to ensure that outreach efforts use consistent communications messaging and tools</li> <li>• Responsible for DBE/ESB recruitment, outreach, management, monitoring, oversight, and reporting for EEO compliance</li> <li>• Serves as DBE/ESB liaison with the Department</li> <li>• Attends regularly scheduled meetings regarding the purchasing/subcontracting process</li> <li>• Coordinates with Discipline Leads to develop bid submittal packages that are an appropriate size and scope for small businesses</li> </ul>
	<p><b>Outreach Training Manager</b></p>	<ul style="list-style-type: none"> <li>• Reports to the CRPM</li> <li>• Communicates with the Construction Manager, Discipline Leads, and subcontractors to identify and monitor training needs</li> <li>• Develops and implements training process for Project personnel regarding DBE/ESB program and EEO compliance</li> <li>• Develops and implements training programs to increase DBE/ESB success on the Project, and help DBE/ESB firms grow their businesses in the future</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Pam Waldenmyer</p>	<p><b>HR Manager Contract Compliance Manager EEO Officer</b></p>	<ul style="list-style-type: none"> <li>• Reports to the CRPM</li> <li>• Responsible for development, implementation, and management of the following:               <ul style="list-style-type: none"> <li>○ Employee hiring and engagement</li> <li>○ Talent assessment</li> <li>○ Change management</li> <li>○ Succession planning</li> </ul> </li> <li>• Coordinates a cross-functional team to execute key corporate initiatives identified by KMP Executive Management</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Lee Skiles</p>	<p><b>Workforce/ Community Development/ Training Coordinator</b></p>	<ul style="list-style-type: none"> <li>• Reports to the CRPM</li> <li>• Responsible for workforce recruitment, outreach, management, monitoring, oversight, and reporting for workforce development and EEO compliance</li> <li>• Serves as workforce development liaison with the Department</li> <li>• Coordinates KMP outreach and operations with our union partners (operating engineers, laborers, and carpenters), as well as subcontractors</li> <li>• Responsible for training of Project personnel for Workforce Development Program and EEO compliance</li> <li>• Develops training programs and works with unions/community partners for effective implementation of workforce training programs</li> <li>• Partners with Ana Mostaccero of Bilingual Communications Services, a member of the Public Information Team, to develop necessary trainings and communications in Spanish</li> </ul>

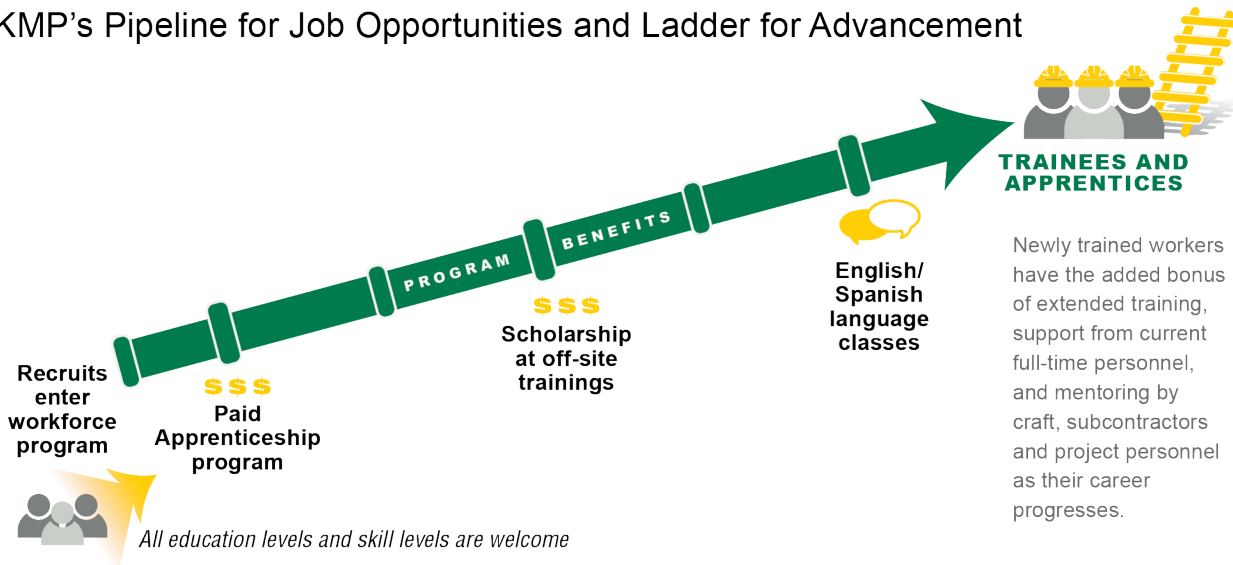


### 2.1.3 WORKFORCE RECRUITMENT

KMP Team members and their subcontractors jointly embrace a Workforce Development Plan that focuses on recruitment. We identify the specific skill categories and timing for workers needed prior to NTP 2. Although we continue to recruit workers throughout the Construction Period, this effort reflects current conditions in the economy, number of workers, and availability of workers. KMP’s entire Team, including subcontractors and subconsultants, commits to meeting, or exceeding, Workforce Development goals.

Our model Workforce Development Program creates a pipeline of job opportunities and a ladder for advancement that encourages workers of different ages, skill levels, and education to complete training programs and advance in their careers (see next figure). Once on the job, we support new workers by offering additional Onsite training, and encouraging mentor relationships with more-experienced craftsmen, subcontractors, and other Project personnel as the new workers advance in their careers.

KMP’s Pipeline for Job Opportunities and Ladder for Advancement



KMP uses a combination of new and existing channels of communication and outreach processes to engage the community, stimulate interest among adults, and introduce the wide variety of design, construction, and operation-related roles, trades, and skills to younger adults who may join the workforce during the Project. For example, KMP’s Lead Contractor, Kiewit Infrastructure, Inc. (KIC) sponsors a Building Construction Futures Program that exposes young people to the design and construction industry and trades. The program highlights the different types of positions within the construction industry, presents a hands-on activity, and includes a tour of a current project. KIC has sponsored this program with organizations including the Boys and Girls Club, Girls Inc., and Masters Apprentice Program to name a few.

## Kiewit's Building Construction Futures Program



KMP's Lead Engineer, Parsons Brinckerhoff, Inc. (PB) also sponsors many Denver area agencies including its Corporate Partnership with the Women's Transportation Seminar (*Advancing Women in Transportation*), as well as monthly outreach to area schools and colleges in an effort to educate students on the roles and responsibilities of the engineering profession, and to recruit new engineering apprentices and staff.

### 2.1.3.1 Recruitment

KMP, KIC, PB, and all subcontractors clearly state "An Equal Opportunity Employer" in all advertisements for employees. We partner with unions and other local workforce development groups to recruit minority populations and women in the Project corridor. In addition, we use both public and private employee referral sources likely to yield qualified minorities and women, and encourage current employees to refer minorities and women as applicants for employment. The following table is a sampling of the community, educational, and industry partners from which KMP and our Team members recruit future workers on the Project. These partners help new hires bypass many existing barriers to employment.

### Community, Educational, and Industry Partners

Education	Workforce	Faith & Religion	Housing	Childcare	Community
 <ul style="list-style-type: none"> <li>• Bruce Randolph School</li> <li>• Pickens Technical College</li> <li>• Denver Urban Scholars</li> <li>• Centro San Juan Diego</li> <li>• Arrupe Jesuit</li> <li>• DPS Career Connect</li> <li>• Emily Griffith STRIVE Prep</li> </ul>	 <ul style="list-style-type: none"> <li>• Eastside Workforce Center</li> <li>• Colorado Construction Institute</li> <li>• Denver Works</li> <li>• Construction Careers Now!</li> </ul>	 <ul style="list-style-type: none"> <li>• Catholic Charities of Denver</li> <li>• Annunciation Catholic Church</li> <li>• New Hope Baptist Church</li> <li>• Our Lady of Grace Church</li> </ul>	 <ul style="list-style-type: none"> <li>• Adams County Housing Authority</li> <li>• Northeast Denver Housing Center</li> <li>• Bridge Project</li> <li>• Bo Mathews Center for Excellence</li> <li>• Gathering Place</li> <li>• FRESC</li> </ul>	 <ul style="list-style-type: none"> <li>• Focus Points</li> <li>• Catholic Charities of Denver</li> <li>• Mile High United Way</li> </ul>	 <ul style="list-style-type: none"> <li>• Community Enterprise</li> <li>• GES Livewell</li> <li>• Far Northeast Neighbors Inc.</li> <li>• Focus Points</li> <li>• Sunnyside United Neighbors Inc. (SUNI)</li> <li>• Whittier Neighborhood Assoc.</li> </ul>



The KMP Team is promoting our OJT program during individual conversations, public workshops, and other events during the Pre-Submittal Period with the Colorado subcontracting community, Disadvantaged Business Enterprise/Emerging Small Business (DBE/ESB) firms, and a wide range of community and industry organizations. We have discussed workforce opportunities on the Project with the following organizations:

- International Union of Operating Engineers Local 9 (construction equipment operators)
- Colorado Carpenters Local 55 (carpenters)
- Laborers International Union Local 720 (laborers)
- International Brotherhood of Electrical Workers Local 68 and 111 (electricians)
- Conference of Minority Transportation Officials—Colorado Chapter (COMTO)
- Black Construction Group (BCG)
- Hispanic Contractors of Colorado (HCC)
- Denver Metro Small Business Development Center
- Aurora Small Business Development Center
- Commerce City Small Business Development Center
- Colorado Black Chamber of Commerce
- Women's Transportation Seminar (WTS)
- Denver Hispanic Chamber of Commerce of Metro Denver
- Rocky Mountain Indian Chamber of Commerce
- Minority Business Development Agency

Following notice to proceed (NTP), we continue to provide relevant trade, community, and employment organizations with specific information regarding job opportunities, scope of work, length of operations, and the sequence and schedule of operations.

Our Workforce Development Team is visible and actively engaged with communities along the Project corridor. KMP's Project Office is located in the heart of the Project corridor, allowing residents to speak with KMP's Workforce Development Team, learn about workforce initiatives and activities, and find employment opportunities, resources, and links to training and support. The Project Office features a video kiosk and print displays with Project information and employment opportunities, and a computer or iPad available for use by visitors interested in more detail.

To stimulate the local community's interest in the Project and recruit needed workforce resources, the KMP Team coordinates with a variety of partners, described in the sub-sections below:



### 2.1.3.2 Local Unions

The KMP Team has long term, productive relationships with local unions for operators, carpenters, and laborers, and we coordinate closely with union representatives to supplement their successful apprenticeship programs and recruiting processes. Our collaboration with unions expands the pool of workers who accomplish the mandatory minimum hours required for union membership. In addition, current union members can increase their apprenticeship hours by working on the Project, and position themselves to move from apprentice to journeyman status.

We partner with the unions to coordinate special events and publicize employment opportunities on the Project.

### 2.1.3.3 Denver Public Schools

The KMP Team proudly continues its relationship with Denver Public Schools, supporting existing programs that spark interest for young people in design and construction. Our goal is to emphasize meaningful, long term careers over temporary, or short term, assignments. For example, in October 2015 and November 2016, KMP participated in the Denver Public Schools' Career Fair for eighth-graders, which connected more than 3,000 students with 160 businesses. At this event, we introduced students to career possibilities in the design and construction industry, including on the Central 70 Project.

In addition, we recognize that non-English-speaking parents often discover resources and employment opportunities through their English-speaking children. We are therefore working with Denver Public Schools to develop creative ways to reach non-English speakers and promote job opportunities on the Project. Ana Mostaccero of Bilingual Communications Services, a DBE firm on our Public Information Team, assists us with this outreach effort. See Appendix J, Strategic Communications for further details.

### 2.1.3.4 Industry Association Partners

The Colorado Contractors of Colorado (CCA), Associated General Contractors (AGC), American Council of Engineering Companies (ACEC), WTS, and HCC are some of the most involved and forward-thinking organizations addressing workforce development issues in Denver's design and construction community. Our Team members partner with these organizations, and have done so for more than a decade. Currently, staff from Kiewit and PB serve on the Boards of many of our industry association partners.

CCA is committed to recruiting people for the industry and training them for jobs. For example, CCA holds a yearly event for high school juniors and seniors at the Adams County Fairgrounds, called Colorado Construction Career Days. At this event, students from across the Denver metro area explore opportunities in the construction industry through hands-on activities. KMP sponsored a booth at the September 2016 event, where students built a replica of the Colorado State Capitol out of cans of food, which KMP later donated to the Food Bank of the Rockies.



KMP offers scholarships for CCA University through the Construction Workforce Foundation of Colorado that support training programs and employee recruitment efforts. CCA University offers classes and certification for Traffic Control Supervisors and other relevant positions.

Furthermore, a partnership of KMP, the construction community, and Emily Griffith Technical College developed and implemented the Construction Careers Now! program. This program consists of a four-week curriculum that introduces career opportunities and relevant skills in the construction industry to people currently unemployed and underemployed. A list of topics covered by the Construction Careers Now! Program is shown below.



## Introduction to Construction Careers

### OVERVIEW

- Opportunities, job titles, responsibilities, career paths
- Basic terminology
- **HANDS ON** Basic and current power tools and equipment on job sites
- Expectations of employers and employees

### BASIC CONSTRUCTION MEASUREMENT SAFETY

- Job hazard analysis
- Treating injuries
- Personal protective equipment
- Material safety data sheets
- CPR
- 10-Hour OSHA certification

### BLUEPRINT READING

- Plan review
- Spec review
- Print to wireless
- BIM introduction

### BUILDING TECHNOLOGIES

- Concrete foundations and slab-on-grade, vertical formwork
- Framing/flashing
- Doors/windows, door hardware
- Trim – window, door, floor, ceiling
- Drywall installation and finishing
- Electrical
- Specialties

### LEADERSHIP/ SOFT SKILLS

- Listening and communication skills
- Positive attitude
- Work ethics/ productivity
- Time management/ organization
- Personal responsibility
- Sense of urgency – working on schedule
- Interview skills and mock interviews
- Computer skills: digital jobs in the field

### 2.1.3.5 Spanish-Language Media

KMP joins HCC in partnering with the Denver area Spanish media outlets for radio programs and community service announcements that identify employment opportunities and provide instructions to interested candidates about how to become trainees or apprentices on the Project. The following table provides a partial listing of Spanish-language media in Colorado.

### Spanish-Language Media (SAMPLE listing)

Location	Station	Name	State	Website
Aspen	KPVW 107.1 FM	La Tricolor	Colorado	<a href="http://tricolor.entravision.com/aspn/">http://tricolor.entravision.com/aspn/</a>
Denver	KJMN 92.1 FM	Jose	Colorado	<a href="http://www.jose921.com">www.jose921.com</a>
Denver	KMXA 1090 AM	Super Estrella	Colorado	<a href="http://www.denverse.com">www.denverse.com</a>
Denver	KXPK 96.5 FM	La Tricolor	Colorado	<a href="http://www.965tricolor.com">www.965tricolor.com</a>

The extent, and influence, of these stations create an excellent cross-promotional platform for KMP to communicate employment and apprenticeship opportunities to Hispanic workers.

#### 2.1.3.6 Social Media

Our Workforce Development Team uses social media to communicate employment opportunities, training programs, and Project information. Our Workforce Development Team also monitors social media sites to confirm that our posts reach a broad audience, contain clear information, and effectively communicate to all users including those with Limited English Proficiency (LEP).

#### 2.1.3.7 Workforce Centers

Workforce centers throughout the Denver Metro area offer employment seekers free job search services and training. KMP partners with the following workforce centers to advertise employment opportunities, participate in job fairs, and hold outreach events for potential workers:

- Arapahoe/Douglas Works  
15400 E. 14th Place Lower Level  
Aurora, CO 80011
- Adams County Workforce and Business Center  
3155 N. Chambers Road, Unit C  
Aurora, CO 80011
- Denver Workforce Center at Montbello  
4685 Peoria Street, Suite 251  
Denver, CO 80239
- Denver Workforce Center at the Denver International Airport  
8500 Pena Boulevard, 5th Level Main Terminal  
Denver, CO 80249





### **2.1.3.8 Presentations to High School and College Students**

KMP partners with schools in the corridor to arrange opportunities to speak with high school and college students about the many career opportunities in the design and construction industry. Our speakers represent a broad range of staff, including those in support functions such as human resources, legal, public involvement, and accounting, as well as Construction and Design staff.

### **2.1.3.9 Community Partners: Outreach**

KMP partners with community organizations to promote the Project to the public and to build awareness of career opportunities on the Project. Our Workforce Development Team conducts outreach activities to recruit individuals with an interest in design and construction-related careers, and introduce the Project to those who may not have previously considered employment in these industries. We provide information for career opportunities in both craft and professional services within KMP's overall outreach strategy presented in Appendix K, Small and Disadvantaged Business Participation Plan (SDBPP), and Appendix J, Strategic Communications Plan.

The following outreach calendar is indicative of KMP's recent efforts.

## Outreach Calendar: Typical Year Events

■ DBE/WBE/SBE FOCUSED    
 ■ FEMALES    
 ■ MINORITIES/DISABLED    
 ■ MINORITIES    
 ■ UNION    
 ■ VETERANS    
 ■ YOUTH

JAN	FEB	MAR	APR	MAY	JUN
<p><b>CCA Annual Conference, CCA/AGC</b></p>	<p><b>Job Tour, US Brazil Connect</b></p> <p><b>Block Kids Event: Mission Viejo Elementary, NAWIC</b></p> <p><b>Job Tour: KBG SCL Aurora Hospital, Masters Apprentice Program</b></p> <p><b>Mock Interview Prep, Masters Apprentice Program</b></p>	<p><b>Hiring Event, MN Hwy 53 (TARO band focus)</b></p> <p><b>Koffee with Kiewit, DBE/SBE/WBE focus</b></p>	<p><b>Military Awareness Event, ESGR</b></p> <p><b>ACMS Building Construction Futures Event, Adam's City Middle School</b></p> <p><b>Arrupe Jesuit Breakfast, Arrupe Jesuit High School</b></p>	<p><b>Building Construction Futures Event, Force Elementary Boys &amp; Girls Club (STEM program)</b></p> <p><b>Emily Griffiths Technical College, Emily Griffiths Career Fair</b></p>	<p><b>Day of Caring Call, Return2Work</b></p> <p><b>Partnership meeting with Laborers and Operators Union, IUOE, Laborers</b></p> <p><b>Koffee with Kiewit</b></p>
JUL	AUG	SEP	OCT	NOV	DEC
<p><b>Building Construction Futures, Boys &amp; Girls Club (Pathways Program)</b></p> <p><b>Career Panel, Mile High Youth Build</b></p> <p><b>ESGR Awards Banquet and Networking, ESGR</b></p> <p><b>Tour of Laborers training facility, Laborers Union</b></p>	<p><b>Tour of Operators training facility, Operators Union</b></p> <p><b>Building Construction Futures, Girls Inc.</b></p>	<p><b>CO Construction Career Days, CCA/AGC</b></p> <p><b>Interview &amp; Resume Prep, Master Apprentice Program</b></p> <p><b>CO Construction Career Days, CCA/AGC</b></p>	<p><b>Contractor Academy Class, Hispanic Contractors of Colorado</b></p> <p><b>BCF: Construction Club, Force Elementary Boys &amp; Girls Club</b></p> <p><b>Denver Public Schools 8th Grade Career Fair, Denver Public Schools</b></p> <p><b>Contractor Academy Class, Hispanic Contractors of Colorado</b></p>	<p><b>Denver Public Schools 8th Grade Career Fair, Denver Public Schools</b></p> <p><b>Mock Interviews/ Career Readiness Training, Masters Apprentice Program</b></p> <p><b>Veterans Event at DVAMC</b></p>	<p><b>Middle School Career Day, Denver Public Schools</b></p> <p><b>Career Readiness Training, Mile High Youth Build</b></p>

**ONGOING** Corporate Work Study Program, Arrupe Jesuit High School



KMP prepares a Project-specific outreach calendar and Public Information strategy to advertise employment opportunities and Project information. Our community outreach with minority, disabled, elderly, and youth populations, and veteran's organizations, unions, small businesses, faith-based organizations, and business owners' associations includes:

- Presenting Project information at our Community Partners' meetings
- Distributing Project information at local community centers and libraries
- Providing information for publication in association newsletters and parent informational packets at Swansea Elementary School and Bruce Randolph School
- Participating in educational career fairs at local community colleges and universities
- Attending chambers of commerce and industry association meetings
- Inviting current employees to talk with various groups about their careers, educational paths, and successes in the construction industry; and creating a speakers bureau to visit various groups and present Project information upon request
- Participating in Department-sponsored meetings and events
- Creating a link on [www.kiewitmeridiampartners.com](http://www.kiewitmeridiampartners.com) for up-to-date Project information and employment opportunities
- Distributing a quarterly newsletter with Project information and highlights on career opportunities, Workforce Development goals, and Project accomplishments

#### **2.1.3.10 Department-Approved Workforce Development Partners**

To give local workers a fair opportunity to participate in the hiring process for vacant positions, KMP and subcontractors advertise all job openings with Department-approved workforce development organizations for seven Calendar Days before advertising the job openings through any other sources. KMP also coordinates with unions to advertise, and fill, available craft positions for selected work trades. See Attachment 1, Colorado Recruitment Sources, for a list of Department-approved workforce development organizations.

### **3. The OJT Plan**

Kiewit, our Lead Contractor, and some of our subcontractors are signatory to the Operators, Carpenters, Laborers and Electricians unions. Each of these unions has a U.S. Department of Labor-approved apprenticeship program, a training facility, and specific training requirements as described in the following sections.

## 3.1 SKILLED CRAFTS

### 3.1.1 OPERATORS: HEAVY EQUIPMENT

Operating Engineers (operators) are personnel who operate, maintain, and repair heavy construction equipment such as cranes, excavators, front-end loaders, and motor graders, used to construct the Project. These skilled personnel are responsible for safely operating equipment and coordinating that equipment's actions with other heavy equipment and other crew members' actions. They are responsible for operating (utilizing the equipment controls); checking to make sure the equipment functions properly; for cleaning, maintaining, and performing basic repairs to equipment; and for reporting malfunctioning equipment to supervisors.

### 3.1.2 CARPENTERS

Carpenters perform a variety of tasks including measuring, cutting, erecting, and joining materials; erecting and dismantling scaffolding, and interior and exterior finish work. They construct concrete formwork; erect precast concrete and steel members; and work with concrete including foundations, walls, and structures; and provide finish carpentry such as fixtures, embedded items, or trim. They erect, level, and install infrastructure components with the assistance of operators and heavy equipment, and they read and follow construction drawings and blueprints so that structures are built to the Client's requirements.

### 3.1.3 LABORERS: SKILLED AND GENERAL

Construction laborers and helpers perform many basic tasks that require physical labor on the Project construction site. Laborers typically clean and prepare construction sites by removing debris and possible hazards; load or unload materials to be used in construction; assist in erecting and dismantling formwork, bracing, scaffolding, and temporary structures; place concrete; dig trenches; backfill holes; compact earthwork; operate and tend light duty equipment and machines used in construction; and help other skilled tradespersons with their duties.

### 3.1.4 ELECTRICIANS

Electricians perform a variety of tasks including installation of conduit and wiring for lighting, ramp meters, traffic signals and other equipment. Work includes making safe connections for electrical components such as transformers and circuit breakers, identification of electrical problems using a variety of testing devices and the repair/replacement of wiring or fixtures using hand tools and power tools. They are required to read blueprints or technical diagrams and must complete work in accordance with a variety of standards and building codes (NEC).



The following table compares the estimated Project Hours with the estimated OJT Hours.

**Estimated Project Hours and OJT Hours**

Description	Project Estimated Hours	Estimated OJT Hours
Operators	470,000	94,000
Carpenters	110,000	22,000
Laborers	400,000	80,000
Electricians	275,000	56,000

**3.2 APPRENTICESHIP PROGRAMS**

Each of the following apprenticeship programs has a unique curriculum and training hour requirements.

- Laborers Union
  - Training for 40 hours before starting work
  - Re-training for 2 weeks every 1,000 hours
  - Training facility located at Brighton Training Center
  - Curriculum:
    - 1<sup>st</sup> Week: Pre-construction training consisting of Department flagger training and Occupational Safety and Health Administration (OSHA) 10-hour construction training
    - Block 1: General construction and concrete Work
    - Block 2: Scaffold building and mason tending
    - Block 3: Advanced hoisting and rigging, and hoisting and rigging certification
    - Block 4: (Varies) Currently blueprint reading, gravity pipe systems, and pipeline safety
- Operators Union
  - Apprenticeship training is a 3 year program
  - Training occurs at the 160 acre training site in Watkins, CO
  - The apprenticeship involves a six-stage training
  - Training curriculum covers:
    - OSHA 10 hour construction safety
    - Confined space
    - Construction outreach
    - Excavation standards
    - First aid and CPR
    - Hazard communication
    - Hazardous waste operations
    - Disaster site worker
    - Skill training
    - Air brake training
    - Commercial driver’s license (CDL)
    - Crane operator
    - Forklift training
    - Grade checking

- Journeyman and Apprentice classes
    - Operating skill training on a variety of machines
    - Operator skills training
  - Welding
- Carpenters Union
  - Training for 144 hours every year for 4 years
  - Training facility located at CITC of Colorado; 646 Mariposa Street., Denver, CO
  - First Year Curriculum:
    - Basic safety
    - Basic employability skills
    - Construction math
    - Introduction to hand tools
    - Introduction to power tools
    - Basic communication skills
    - Introduction to material handling
    - Basic rigging
    - Introduction to construction drawings
    - Reading plans and elevations
    - Introduction to light equipment
    - Safety requirements with concrete
    - Introduction to concrete, reinforcing materials, and forms
    - Site layout—distance and measurement
  - Second Year Curriculum:
    - Properties of concrete
    - Reinforcing concrete
    - Handling and placing concrete
    - Rigging equipment
    - Rigging practices
    - Commercial drawings
    - Trenching and excavating
    - First aid and CPR
    - Foundations and slab-on-grade
    - Vertical formwork
    - Horizontal formwork
    - Tilt-up panels
    - Welding
  - Third Year Curriculum:
    - Floor systems
    - Wall and ceiling framing
    - Windows and exterior doors
    - Roof framing
    - Your role in the Green environment
    - Cold form steel framing
    - Drywall installation
    - Exterior finishing
    - Roofing applications
    - Advanced roof systems
    - Thermal and moisture protection
    - 10-hour OSHA



- Fourth Year Curriculum:
  - Site layout—angular measurement
  - Doors and door hardware
  - Window, door, floor and ceiling trim
  - Review of IBC
  - Building materials, fasteners, and adhesives
  - Cabinet fabrication and installation
  - Interior finish
  - Advanced wall systems
  - Basic and advanced stair layout
  - Introduction to crew leader skills
  - Sustainable construction supervisor
- Electricians Union
  - Training for 144 hours every year for 4 years
  - Training facility located at CITC of Colorado; 646 Mariposa Street, Denver, CO
  - First Year Curriculum:
    - Orientation to the electrical trade
    - Basic communications and employability skills
    - Construction math
    - Basic safety and electrical safety
    - Hand tools and power tools
    - Hand bending
    - Introduction to material handling
    - Basic rigging
    - Introduction to electrical circuits and electrical theory
    - Electrical test equipment
    - Introduction to the National Electrical Code
    - Raceways, boxes, and fittings
    - Conductors and cables
    - Introduction to construction specifications
    - Introduction to construction and electrical blueprints
    - Residential electrical services
    - Introduction to Green building
    - 10-hour OSHA training
    - Basic principles of construction—supplemental
    - Mathematics for electricians—supplemental
    - Interpreting the National Electrical Code—supplemental
    - Electrical experiments laboratory workbook—supplemental
    - Understanding construction drawings—supplemental
  - Second Year Curriculum:
    - Introduction to alternating current (AC) theory
    - Introduction to inductance
    - Power and the AC circuit
    - Capacitance
    - Capacitance, inductive, and resistive circuits
    - Power factor correction
    - Single-phase transformers
    - Motors: theory and application
    - Three-phase alternators

- Three-phase AC circuits
- Three-phase AC motors
- Single-phase AC motors
- Conduit bending
- Pull and junction boxes
- Conductor installations
- Cable tray
- Conductor terminations and splices
- Electric service installation
- Grounding
- General grounding principals
- System grounding
- Grounding electrode system
- Enclosure, raceway, and service cable grounding
- Over current protection one, two, and three
- Circuit breakers and fuses
- Contactors and relays
- Lightning fundamentals
- CPR and first aid training
- Electrical grounding and bonding supplemental
- Third Year Curriculum:
  - Load calculations—branch circuits and multi-family dwellings
  - Conductor selection and calculations
  - Voltage drop—AC and DC
  - Intermediate overcurrent protection
  - Raceways, boxes, and fitting fill requirements
  - Wiring devices
  - NEC and distribution equipment
  - Transformers
  - Lamps, ballasts, and components
  - Motor calculations
  - Overload protections for motors
  - Disconnects for motors
  - Distribution equipment
  - Motor controllers
  - Voice, data, and video systems
  - Hazardous locations
  - Hazardous locations wiring methods
  - Solar photovoltaics
  - American Electrician’s Handbook—supplemental
  - Electrician’s Reference in Motors—supplemental
- Fourth Year Curriculum:
  - Load calculations—feeders and services
  - Advanced load calculations
  - Leadership class 1
  - Introductory skills for the crew leader
  - Health care facilities
  - Special locations
  - Standby and Emergency Systems





- Generator Installation 1 and 2
- Uninterruptible Power Supply (UPS) and battery storage systems
- Electronics
- Introduction to fire alarm systems
- Specialty transformers
- Advanced controls
- HVAC control systems
- Heat tracing and freeze protection systems
- Welding machines
- Motor operation and maintenance
- Medium-voltage terminations/splices
- How Green fits in with international codes
- Your role in the Green environment
- Construction Scheduling—supplemental
- Electrician’s Reference in Motors—supplemental

### 3.3 MONITORING THE OJT PLAN

KMP provides education and training to its managers, supervisors, and subcontractors on the key factors required for workforce development initiatives, training opportunities, and the importance of using qualified workers on the Project.

#### 3.3.1 MONITORING OJT HOURS

KMP’s certified payroll system, documents OJT hours for direct employees of Kiewit, and maintains the hours reported by all subcontractors on the Project. KMP requires each subcontractor to maintain detailed records of approved OJT activities. The KMP Team calculates OJT participation during the Construction Period by including:

- Trainees enrolled in an approved program of the Department and the Federal Highway Administration (FHWA)
- Apprentices enrolled in an approved program of the US Department of Labor
- Trainees enrolled in an approved program of the CCA
- Other Department-approved programs

Before training begins, we request the Department’s Approval of proposed apprentices and trainees, for proper allocation toward achieving the Construction Period OJT goal. We forward proper registration forms and associated documentation for each apprentice or trainee to the Department for Approval. KMP does not count an apprentice or trainee toward the Construction Period OJT goal if that individual has already worked, or been paid, at a professional/journeyman status for more than 6 months prior to the Department’s Approval of their participation as an apprentice or trainee.

Before training begins, KMP provides each apprentice or trainee with a copy of the approved training program, pay scale, pension and retirement benefits, health and disability benefits, promotional opportunities, other employer policies, and complaint procedures.

### 3.3.2 MONITORING APPRENTICES AND TRAINEES

KMP maintains a database that tracks the progress of participants through all aspects of training. KMP requests that Project Managers, supervisors, and subcontractors regularly talk with, and provide constructive feedback to, apprentices and trainees. KMP requires subcontractors to send a monthly tally of current apprentices and trainees, and their progress, to our Workforce Development Team.

Our Workforce Development Team compiles feedback from workers, managers, supervisors, and educational partners to gauge the effectiveness of the learning experience. KMP discusses promotional opportunities with female, minority, veteran, and disabled personnel during annual performance reviews. In addition, KMP assesses individual performance and course completion rates to reveal educational best practices, and any underlying challenges, during various stages of the Work assignments.

### 3.3.3 ALLEVIATING BARRIERS

Local residents face numerous barriers to accessing employment opportunities in the construction industry. KMP plans to address these barriers, including:

- **Language:** Work with Denver Public Schools to develop creative ways to reach non-English speakers and promote job opportunities on the Project
- **Transportation:** Support travel between the union training facilities and the Work Site
- **Wages during training:** Provide scholarship funding during the required apprenticeship training
- **Childcare:** Provide easily accessible information about local community childcare providers

As noted earlier, the primary goal of our outreach, recruiting, and training efforts is to create a pipeline of job opportunities and a ladder for advancement, to encourage workers to improve their professional skills, achieve positions of increasing complexity, and build long term careers in the construction industry. Our goal encourages workers who demonstrate leadership and managerial skills to complete relevant training, and progress from an apprentice to journeyman status.

KMP's outreach enables local residents to find employment opportunities by visiting our Project Office, or by attending the many recruiting events where KMP presents information on the following trainee benefits:

- The opportunity to earn as you learn
- The ability to acquire job and career advancement skills
- The benefits of learning in a hands-on environment
- The opportunity to gain long term employment

During the screening process, KMP and the unions:

- Clearly communicate working conditions, physical requirements, and necessary aptitudes
- Assess basic skills levels and training needs
- Assess deficiencies in soft skills and training needs
- Address relevant barriers to success (for example, language proficiency or transportation to/from training site)
- Discuss training plan, including short term and long term objectives



- Match Project needs with applicant abilities and employment goals

KMP confirms the fair treatment of applicants during the hiring process without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability, or any other characteristic protected by federal, state, or local law.

During the hiring process, KMP and the unions:

- Discuss training plan details
- Clearly communicate wages/benefits (for apprentices)
- Clearly communicate applicable safety, jobsite, and regulatory requirements (for example, Davis-Bacon Act, non-discrimination, sexual harassment, and other relevant regulations)
- Encourage long term employment

### 3.4 APPROACH TO GRADUATING PARTICIPANTS

Each union has a unique apprenticeship program with different milestones to achieving journeyman status. The KMP Team collaborates with the unions to celebrate the completion of each milestone, and the apprentice’s eventual graduation to journeyman. By recognizing each worker’s movement up the ladder of advancement, we encourage retention and demonstrate the long-term employment potential in the construction industry.

KMP is partnering with the unions to increase the number of workers starting, and ultimately graduating from, apprentice and trainee programs. We also coordinate with the unions to identify reasons workers, particularly local, minority, LEP, and female workers, drop out of the apprenticeship and trainee programs, to find ways to resolve the issues and keep workers in the program.

KMP anticipates a steady stream of people entering the apprenticeship and training programs, and advancing through skill levels, so that we have a sufficient number of construction workers on the Project.

### 3.5 ANNUAL SCHEDULE OF TRAINING HOURS

The following table identifies the annual schedule of training hours for the Project between 2018 and 2022. The training hours reflect the amount of construction activities occurring in each year. Since the intermediate years of the Project are the busiest, those years accommodate the largest number of training hours.

**Annual Schedule of Labor Hours (Estimated)**

Year	Apprentice Laborers	Apprentice Carpenters	Apprentice Operators	Apprentice Electricians
2018	8,000	2,200	9,400	5,500
2019	20,000	5,500	23,500	13,750
2020	28,000	7,700	32,900	19,250
2021	20,000	5,500	23,500	13,750
2022	4,000	1,100	4,700	2,750
<b>Total Labor-Hours</b>	<b>80,000</b>	<b>22,000</b>	<b>94,000</b>	<b>55,000</b>

### 3.6 RECOVERY TOOLS/METHODS

KMP uses a variety of methods to achieve steady and consistent progress toward the overall goals for the Project. First, we use a detailed Schedule of activities to define a realistic path for achieving Workforce Development goals during the Construction Period. Our Workforce Development Team performs monthly analyses of workforce recruitment, outreach, good-faith efforts, and utilization (including that of subcontractors), and identifies variances immediately. This continuous monitoring and reporting, as well as coordination with unions and monitoring of subcontractors, highlights issues for KMP to immediately address and resolve.

Our approach for attaining Workforce Development Goals focuses on eliminating barriers to participation, and creating a pipeline of job opportunities and a ladder for advancement to encourage a consistent supply of ready, willing, and able workers. This approach eliminates the need for workforce recovery tools and methods. Our approach for a successful Workforce Development Program consists of the following:

- By advertising at community outreach events, we help individuals find job opportunities, allow them to ask questions of the KMP Team, and enable them to immediately access training opportunities, resources, and support
- By communicating with high school and college students about the Project and careers in the design and construction industry, we attract new workers during the life of the Project
- By coordinating with community and industry organizations, and partnering with local unions, we reach a large pool of adult workers available to immediately enter the Project's workforce
- By providing financial support during training, transportation to and from training locations and job sites, Spanish and English-language classes, and Onsite support and mentoring to apprentices and trainees, we eliminate some of the most challenging barriers to recruitment and retention of workers on the Project

## 4. Other Training

KMP offers a strong, ongoing training program for all our employees, although we do understand that some of our training courses do not apply toward OJT requirements. The ongoing training courses teach our employees about safety, quality management, environmental issues, new trends, and best practices. Our employees enhance their professional skills, which adds value to each new job they perform.

### 4.1.1 ORIENTATION AND JOB PREPAREDNESS TRAINING

The KMP Team conducts job preparedness training for all new employees to the Project, including those of subcontractors and designers. These trainings help new workers understand KMP's expectations for employees and partners, and rules for working on the Project Site (for example, Onsite safety measures, codes of conduct in the workplace, conflict resolution skills, communication and interpersonal skills, and other relevant topics). We also request the Department's participation in these orientations to further emphasize the importance of our message of safety, quality, and commitment to the local community.



#### 4.1.2 ONSITE TRAINING

Our Team understands that properly training craftsmen has a direct, and immediate, impact on the quality of Work and the safety of our job sites. By supporting the training and advancement of craftsmen, we help to maximize current and future career opportunities for local workers to become productive members of their trades. Onsite training opportunities include:

- Safety briefings with daily reminders on specific topics (for example, traffic awareness)
- A Green Hat Program, making new workers easily identifiable so that more experienced employees can guide them in performing their duties properly and safely
- Weekly hands-on training by craftsmen on the proper use of tools and equipment
- Job hazard analysis and Work plan development with supervision
- Weekly toolbox meetings to discuss safety, quality, compliance, and environmental issues

The table below indicates the range of regularly scheduled, Onsite meetings that present opportunities for training, learning, and advancement.

#### Regular Training to Prepare Workforce for Advancement

Meeting	Frequency	Details
<b>Monthly Mass Safety Meeting</b>	Monthly	<ul style="list-style-type: none"> <li>• Held at the start of the shift on the first Monday each month</li> <li>• Includes all Project personnel and the Department</li> </ul>
<b>Daily Coordination Meeting</b>	Daily	<ul style="list-style-type: none"> <li>• Held to discuss the next 24 hours of activity</li> <li>• Reviews safety, quality, Maintenance of Traffic (MOT), site access, and materials</li> </ul>
<b>Play-of-the-Day Meeting</b>	Daily	<ul style="list-style-type: none"> <li>• Held at the beginning of each work day</li> <li>• Focuses on the execution of planned operations, and offers an opportunity to discuss hazards</li> </ul>
<b>Safety, Quality, and Environment</b>	Daily	<ul style="list-style-type: none"> <li>• Reviews hazard analysis for the day's Work</li> <li>• Reminds workers, before start of shift, of the importance of safety on the Project</li> <li>• Reminds workers of proper personal protective equipment and procedures</li> <li>• Reminds workers, before start of shift, of the importance of quality</li> <li>• Reviews quality requirements for the day's Work</li> <li>• Reviews environmental issues/risks for the day's Work</li> <li>• Reviews environmentally sensitive areas, and any restricted activity periods/setbacks in effect</li> </ul>
<b>Safety and Quality</b>	Weekly	<ul style="list-style-type: none"> <li>• Reviews issues from weekly safety walk</li> <li>• Assigns corrective actions for safety issues (if necessary)</li> <li>• Provides safety training</li> <li>• Reviews issues from quality inspections</li> <li>• Assigns corrective actions for quality issues (if necessary)</li> <li>• Provides quality training</li> <li>• Reviews contract requirements</li> </ul>

Meeting	Frequency	Details
<b>Weekly Toolbox Meeting</b>	Weekly	<ul style="list-style-type: none"> <li>• Held the first workday of the week, at the start of shift</li> <li>• Includes all craftsmen</li> </ul>

#### 4.1.3 ONGOING PERFORMANCE SUPPORT

KMP provides ongoing support for workers to perform successfully on the Project. We encourage open communication, guidance, and mentoring among craftsmen, subcontractors, Project personnel, and new workers. This allows KMP to gauge new workers’ understanding of Project requirements, and their confidence level in learning new skills. KMP discusses Work-related challenges, receives local worker feedback, and seeks resolution of workplace issues in the most constructive manner. Our Workforce Development Team meets monthly with Project supervisors to identify any issues or potential areas for program enhancement.

## 5. Local Hiring Plan

The KMP Team has a long history of working in the City and County of Denver, and throughout the state of Colorado, and has many affiliates, subsidiaries, and entities that provide a diverse range of services in the design and construction industry. Our plan for meeting the Project’s Local Hiring goal is discussed in the sections below.

### 5.1 STRATEGIC APPROACH FOR MEETING THE LOCAL HIRING GOAL

The large number of KMP Team members who live in Denver, and throughout the state of Colorado, means that we have a ready pool of potential local workers. Kiewit, by itself, has 117 employees living within the Local Hiring zip codes along the Project corridor, and an additional 1,000 who live in other areas within the state. In addition, KMP has support of 327 laborers and 370 carpenters who currently live within the Local Hiring zip codes and who are active members of their applicable unions. As signatory parties to these unions, KIC can request their service on this project.

While not all of these employees will work on this Project, they do provide well-established relationships with unions, community associations, and industry organizations from which we can recruit high quality workers for the Project.

To address concerns with workforce development, the Department completed a *Community Job Readiness and Workforce Needs Assessment*. KMP participated in the Department’s Workforce Roundtables and other Workforce Development Programs, and our Local Hiring program reflects the following lessons learned:

- The Project requires a diverse workforce of engineers, craftsmen, operators, laborers, maintenance personnel and office support staff. Workers living within the Local Hiring zip codes have expressed their desire for employment opportunities with a clear pathway for career advancement and job security.
- Recruiting workers for construction and construction-support jobs requires comprehensive public outreach using a variety of communications tools including websites and social media; meetings with small businesses, schools, community associations, faith-based organizations, and trade organizations; as well as a presence at job fairs, advertisements in newspapers; and distribution of newsletters.





# CENTRAL

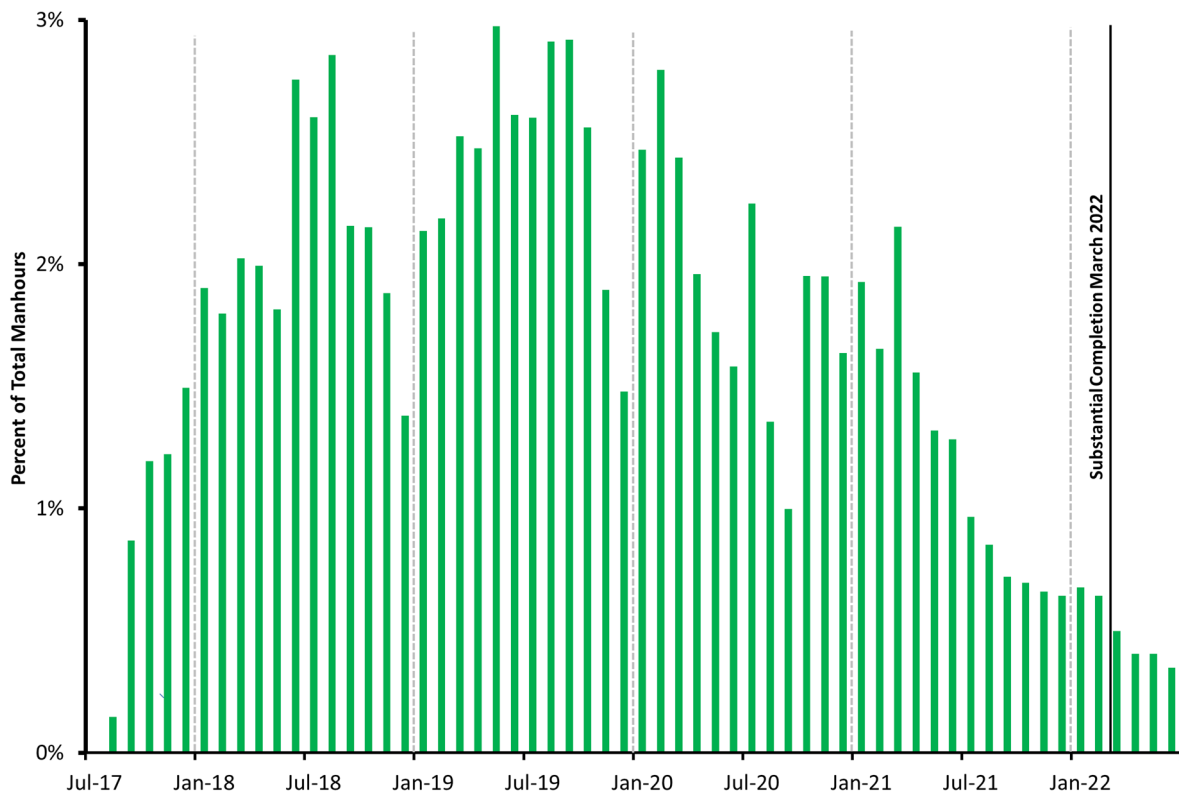
- KMP encourages current employees who live within the Local Hiring zip codes to spread the news to their neighbors and friends about the many career opportunities available on the Project.

The next table indicates the jobs on which KMP is focusing our recruitment efforts, in order to meet the Construction Period Local Hiring goal.

### Targeted KMP Recruitment Efforts to Meet the Local Hiring Goal (Construction Period)

Jobs for KMP Recruitment Efforts	Estimated Length of Employment
Operators ( <i>Apprentices/journeymen</i> )	45 months
Carpenters ( <i>Apprentices/journeymen</i> )	45 months
Laborers ( <i>Apprentices/journeymen</i> )	45 months
Electricians ( <i>Apprentices/journeymen</i> )	45 months
Office Support Staff ( <i>Receptionists, clerks, payroll, accounts payable/receivable</i> )	51 months
Design Support Staff ( <i>CADD, Document Control</i> )	15 months
Field Support ( <i>Surveyors, quality testers, flaggers/traffic control</i> )	51 months
Design ( <i>Engineers, designers</i> )	15 months

### Estimated Schedule of the Distribution of Total Man-Hours for the Construction Period



## 5.2 ASSISTANCE TO PROSPECTIVE AND CURRENT LOCAL EMPLOYEES

Our approach to assisting prospective, and current, local employees eliminates barriers to employment and promotes retention. The following table summarizes our approach, which uses the same processes and programs described in Section 2.1.3, Workforce Recruitment. We promote employee retention by encouraging craftsmen to mentor new workers, providing continued Onsite training, and advertising job opportunities on the Project, and future projects associated with KMP Team members, so that local workers can build a long term career in the design and construction industry.

### Workforce Recruitment

Method	Assistance Provided	How Alleviates Barriers
<b>Project Office</b>	Our Workforce Development Team answers questions, provides information about job opportunities, and refers local workers to unions for apprenticeship and training programs.	<p>The Project Office is located within the community, providing local workers easy access to immediate referrals.</p> <p>The Project Office offers a dedicated space with safe access to computers and internet service so the public can visit the Project website and other sites to find employment opportunities on the Project.</p>
<b>Unions</b>	KMP collaborates with unions representing operators, carpenters, and laborers, and refers local workers to training and apprenticeship programs.	<p>New workers to the construction industry can join the union and apply for apprenticeship programs.</p> <p>Current union members can increase apprenticeship hours and position themselves to move from apprentice to journeyman.</p> <p>Unions have their own training programs, training facilities, and resources for employment opportunities, which supplement the Project's resources.</p>
<b>Community, Educational, and Industry Partners</b> <i>(Identified in the Community Job Readiness and Workforce Needs Assessment)</i>	KMP works with partners to identify capable individuals, and direct them to relevant training, pre-apprenticeship programs, basic computing/office skills classes, etc.	KMP provides shuttle transportation to/from the training facility, and a wage during the training period, removing key barriers to career training.
<b>Cultural Awareness Training and Language Classes</b>	KMP offers Spanish-language classes for Project supervisory staff and English-language classes for workers with Limited English Proficiency (LEP).	<p>English classes reduce language difficulties for LEP workers; Spanish-language classes and cultural training helps supervisory staff productively engage with local workers.</p> <p>Apprenticeship, safety, and other trainings in Spanish also help with career development for LEP workers.</p>
<b>Spanish-language Media</b>	Programs on Spanish-language media in Denver and nearby areas identify employment opportunities on the Project and provide information on how to access opportunities.	Spanish-language media reaches local workers using a popular, free, and readily available communications medium.





<b>Project Events</b>	KMP advertises opportunities, participates in job fairs, and holds other events to reach prospective local workers.	These events are free and readily available to the public.
<b>High School and College Job Fairs</b>	Personnel performing a variety of staff, craft, and support functions on the Project speak to high school and college students about diverse careers in the design and construction industry.	Job fairs educate participants regarding diverse opportunities in the construction industry.
<b>Industry-Sponsored Training Programs</b> (CCA, Emily Griffith's Construction Careers Now! Program)	KMP provides scholarships to industry-sponsored training programs, and supports other programs that promote life-long careers in the design and construction industry.	Industry training programs teach skills in construction trades that are in high demand, such as traffic control and erosion control.

### 5.2.1 MONITORING AND TRACKING HOURS

Our Workforce Development Team maintains strong, constructive working relationships with the Department throughout the Project. We prepare accurate and up-to-date records of local worker participation, including by subconsultants, subcontractors, and suppliers. This provides program transparency and assists us in staying on track for meeting Local Hiring Goals.

Our Team uses an industry-proven software platform, LCPtracker, which is seamlessly integrated with InEight Project Suite. LCPtracker allows us to provide real-time reporting to the Department regarding progress toward Local Hiring goals.

During the Construction Period, we take necessary actions to meet or exceed participation goals by:

- Conducting monthly meetings to report progress on Local Hiring Goals
- Identifying newly eligible local workers in the Local Hiring zip codes
- Identifying future opportunities for local workers using our detailed Work Schedule
- Evaluating performance of existing local workers

KMP meets, or exceeds, Local Hiring Goals using the internal procedures and reporting mechanisms described in the following sections.

#### 5.2.1.1 Distributing Goal Responsibilities to Subcontractors

The KMP Team informs subcontractors of Local Hiring Goals and requirements to use qualified local workers from identified Local Hiring zip codes through training, monthly updates and other meetings, and also by example. During our review of subcontracts, we explain in detail the required reporting procedures.

KMP conducts the following activities to encourage substantive participation by local workers on the Project:

- Meet on a regular basis with the Project Manager, supervisors, and subcontractors to discuss opportunities, progress towards goals, and other relevant issues
- Inform subcontractors that a key component in bid evaluation is the use of qualified, local workers
- Review and document subcontractor efforts to identify local workers, and any reasons for rejection
- Require that subcontractors use LCPtracker to report use of local workers as part of their certified payrolls
- Identify highly specialized elements of Work that might limit participation by local workers
- Review and document efforts to select feasible portions of Work to be performed by local workers
- Confirm that subcontractors and local workers submit all required documents
- Review bid submittals for participation levels of qualified local workers
- Provide constructive feedback and support regarding local workers to subcontractors by offering debriefing meetings with the Workforce Development Coordinator and the appropriate Discipline Lead
- Coordinate documentation of good-faith efforts

#### 5.2.1.2 Collecting Data/Ensuring Valid Performance

To monitor and enforce the requirements of Schedule 15, Federal and State Requirements, KMP discloses and maintains employment records for apprentices and trainees, as well as for any workers who count toward achieving the Local Hiring Goal. The Department may verify employment records and information by reviewing personnel files, or interviewing any persons employed by KMP or the subcontractor.

KMP collects data on subcontractor participation and performance, and tallies valid participation by:

- Attending Local Hiring goal compliance meetings with the KMP Team and subcontractors to inform them of current compliance status/deficiencies and provide recommendations for improvements
- Using LCPtracker to document workforce hours that comply with the Local Hiring Goal

In the course of tracking and reporting Local Hiring goals, KMP:

- Develops and maintains a master local worker database for tracking and reporting purposes
- Reviews local worker utilization plans for compliance
- Monitors contracts and related documents for compliance with Local Hiring goals
- Identifies if increases in contract value present additional opportunities for local workers
- Monitors progress of Local Hiring goals, and issues Noncompliance Notices and recommendations for improvement or corrective action
- Monitors and documents actions taken by non-compliant subcontractors to correct deficiencies



### 5.3 CONFIRMING COMPLIANCE WITH RESIDENCY REQUIREMENTS

KMP confirms compliance with the residency requirements for workers that count toward the Local Hiring goal. To be eligible, the workers must perform a function on the Project as skilled or non-skilled labor, and must also meet one of the following eligibility criteria:

- Be a current resident within one of the Local Hiring zip codes for at least 60 days and continue to live in the area
- Be a former resident who lived within one of the Local Hiring zip codes for at least 180 consecutive Calendar Days, and left no more than one year prior to Agreement Date
- Be a displaced resident by a right-of-way relocation

KMP must forward the following items to the Department for Approval prior to assigning hours toward the Local Hiring Goal:

- A Local Hiring Program Enrollment Form
- A self-certifying Residency Disclosure signed by the worker whose employment hours are to be counted toward the Local Hiring goal
- Any additional documentation to prove residency or prior residency on a case-by-case basis as the Department determines is necessary

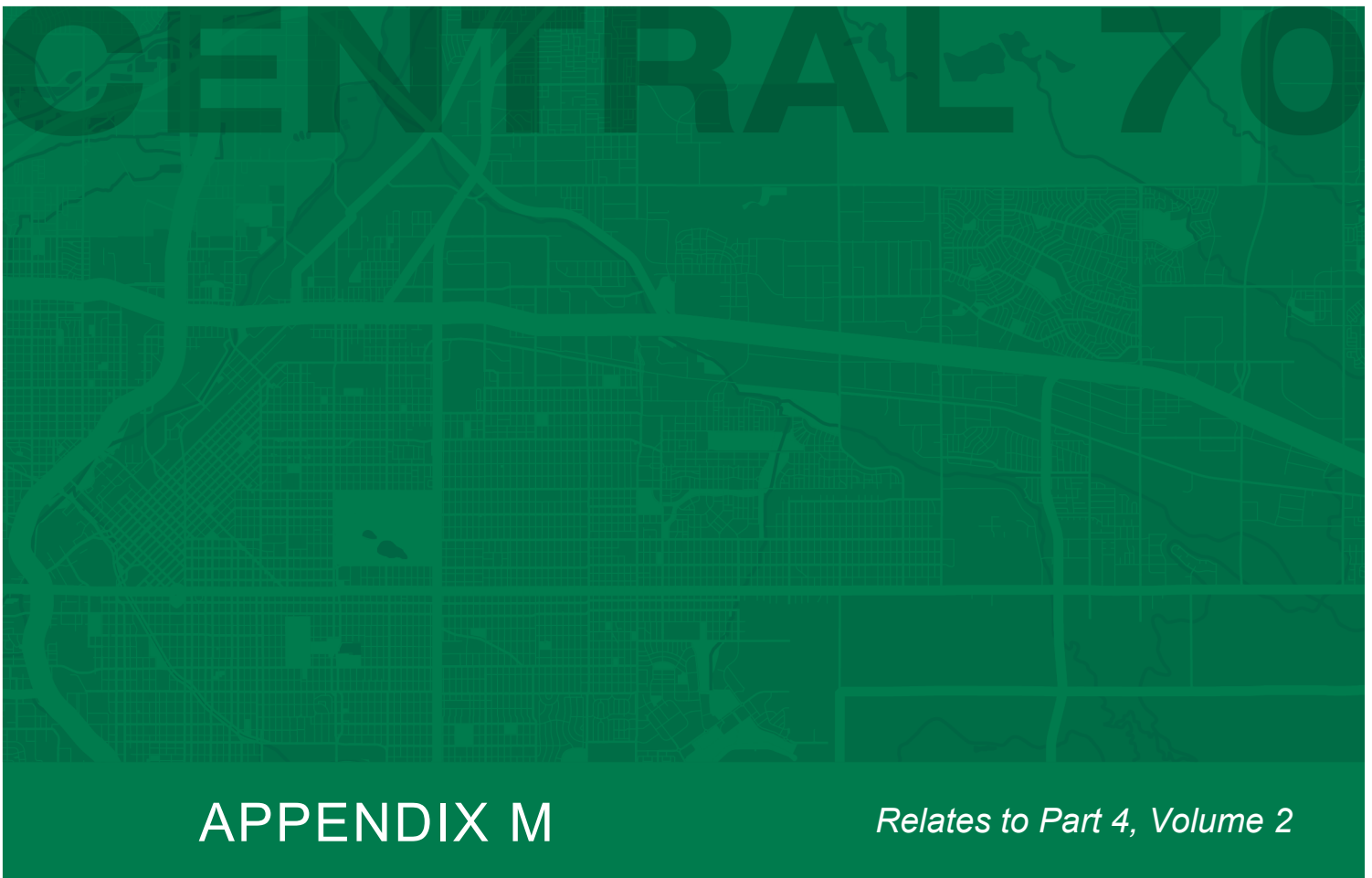
KMP uses LCPtracker to report local worker hours to the Department.

KMP notifies the Department when an accepted current resident worker no longer meets eligibility requirements within 14 Calendar Days of obtaining knowledge of the worker's new residency status. The worker may then be eligible to participate in the program as a former resident, with Department Approval.

To monitor and enforce the requirements of Schedule 15, Federal and State Requirements, KMP discloses employment records for apprentices, trainees, and other local workers that count toward achieving the Local Hiring Goal. The Department may verify employment records and information by reviewing personnel files, or interviewing any person employed by KMP or subcontractors. KMP documents the progress of Workforce Development Plan participation on the Project, including subcontractor participation.

### 5.4 AFFIRMATIVE STATEMENT

No existing employees of KMP or any subcontractor will be displaced, or have their employment terminated, as a result of the Local Hiring Goal.



**Kiewit** **meridiam**

PARTNERS

# Draft Environmental Compliance Work Plan



**SUBMITTED TO:**

Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



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## **SIGNATURE PAGE: APPENDIX M**

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ENVIRONMENTAL MANAGER

DATE

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PROJECT MANAGER

DATE

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DESIGN-BUILD MANAGER

DATE

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OPERATIONS AND MAINTENANCE MANAGER

DATE

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DESIGN MANAGER

DATE



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## RECORD OF REVISIONS

Revision number	Date issued	Pages affected	Comments
0	5/18/2017	All	Proposal Draft Submittal





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## EVALUATION CRITERIA: APPENDIX M, VOLUME 2

KMP has provided a full Evaluation Criteria Matrix to align the requirements of the Environmental Compliance Work Plan (ECWP) per the Project Agreement with the sections of this plan.

Sch. 17 Section	Item	ECWP Section	Section Name	Check
2.1.1	The Developer shall prepare an Environmental Compliance Work Plan ("ECWP") that specifically identifies all of the environmental goals and compliance requirements for the Project and the Developer's detailed plan to meet or exceed those goals and requirements. At a minimum, the ECWP shall comply with the requirements of Sections 14.8.1 and 14.8.2 of Section 14 (Landscaping and Aesthetics) of Schedule 10 (Design and Construction Requirements) and include the following:	2.1	KMP Environmental Goals	<input type="checkbox"/>
2.1.1.a	All environmental elements defined in table "Summary of Impacts and Mitigation for the Preferred Alternative" in the ROD	3.0	Environmental Elements	<input type="checkbox"/>
2.1.1.b	All elements assigned to the Developer in the I-70 East Mitigation Measures Status as provided in the Reference Documents	4.0	Elements Assigned to KMP	<input type="checkbox"/>
2.1.1.c	All elements required by Environmental Law and Environmental Approvals	5.0	Environmental Law and Environmental Approvals	<input type="checkbox"/>
		5.1	Environmental Law	<input type="checkbox"/>
		5.2	Environmental Approvals	<input type="checkbox"/>
2.1.1.d	Description of the means and methods to meet all Environmental Requirements during both the Construction Period and the Operating Period. (To include, for example, detailed procedures that the Developer shall utilize to meet Environmental Requirements for dewatering in both the Construction Period and the Operating Period and any Government Approvals for removal, management, and disposal of RHMs the Developer shall seek.)		Means and Methods	<input type="checkbox"/>
		6.0	Dewatering	<input type="checkbox"/>
			RHMs	<input type="checkbox"/>
2.1.1.e	Description of the process for tracking and documenting the progress and completion of all Environmental Requirements throughout the Construction Period and the Operating Period	7.0	Tracking and Documenting	<input type="checkbox"/>
2.1.1.f	Description of how the Developer's Process Control ("PC") and Independent Quality Control ("IQC") programs shall function to assure compliance with Environmental Requirements and this Agreement	8.0	Process Control and Independent Quality Control Programs	<input type="checkbox"/>
2.1.1.g	Description of how information related to progress, completion and compliance with Environmental Requirements will be communicated to the Department and recorded in the Developer's DCS.	9.0	Compliance Tracking	<input type="checkbox"/>

## EVALUATION CRITERIA: APPENDIX M, VOLUME 2

Sch. 17 Section	Item	ECWP Section	Section Name	Check
2.1.1.h	Description of the roles, responsibilities and qualifications for all members of the Developer's environmental management team, including the Environmental Manager ("EM")	10.0	Environmental Management Team	<input type="checkbox"/>
2.1.1.i	All discipline specific management plans as required pursuant to Section 2.1.2 of this Schedule 17		Not included in the Draft ECWP per Section 2.3.13 of part F of the ITP	<input type="checkbox"/>
2.1.2	<p>Discipline specific management plans:</p> <ul style="list-style-type: none"> <li>a. Air Quality Monitoring, Maintenance, and Mitigation Plan;</li> <li>b. Construction Noise Mitigation and Monitoring Plan;</li> <li>c. Integrated Noxious Weed Management Plan;</li> <li>d. Materials Management Plan;</li> <li>e. Sampling and Analysis Plan;</li> <li>f. Health and Safety Plan;</li> <li>g. Spill Prevention Control Countermeasure Plan; and</li> <li>h. BTPD Management Plan.</li> </ul>		Not include in the Draft ECWP per section 2.3.13 of Part F of the ITP	<input type="checkbox"/>
2.1.3	<p>The Developer shall monitor and improve the effectiveness of its ECWP and resubmit the ECWP annually for Approval (or, in the case of certain of the discipline specific management plans listed in Section 2.1.2 of this Schedule 18 and incorporated in the ECWP, Acceptance as required by Table 17-5 (Deliverables)) upon the anniversary of the ECWP's initial Approval by the Department, or more frequently should any of the following conditions exist:</p> <ul style="list-style-type: none"> <li>a. A plan or procedure no longer adequately addresses the matters it was originally intended to address</li> <li>b. A plan or procedure does not conform with the Project Agreement</li> <li>c. An audit by the Developer or the Department identifies a deficiency in the ECWP requiring an update</li> <li>d. Organizational structure changes require revision to the ECWP</li> <li>e. The Developer is undertaking, or about to undertake, activities that are not covered within the current ECWP</li> </ul>	2.3	ECWP Updates	<input type="checkbox"/>
2.1.4	<p>For all ECWP updates submitted by the Developer to the Department (including updates to each discipline specific management plan) the Developer shall:</p> <ul style="list-style-type: none"> <li>a. Clearly identify in a cover sheet what changes were made in the plan update in order to expedite the Department's review</li> <li>b. Submit to the Department a comparison ("redline") copy of the ECWP, or the relevant parts thereof, together with an unmarked revised ("clean") copy of the ECWP</li> </ul>	2.3	ECWP Updates	<input type="checkbox"/>

# 1. Project Summary

## 1.1 KIEWIT-MERIDIAM PARTNERS CORE VALUES

Kiewit-Meridiam Partners (KMP) is committed to delivering the Central 70 Project (Project) with a focus on client relations, achieving the Project goals, and maintaining transparency with the Department. To achieve these objectives, the KMP Team has adopted the following core values:

### KMP Core Values

Every day we strive to fulfill our role as stewards in our communities—after all, we work in our own backyards.

#### STEWARDSHIP



#### PEOPLE

We are relentless in our ongoing focus that *Nobody Gets Hurt*. We hire bright minds that are hungry for the best training available and committed to Team success.



**KMP's four core values form the cornerstone of our company and the sum of our business ethics conduct. We train on these values so that they are constantly on the minds of our leaders and workforce.**



#### INTEGRITY

We conduct ourselves with the highest levels of integrity. We are responsible, accountable, honest, straightforward, and deal fairly with everyone.



#### EXCELLENCE

We focus on quality production, commit to excellence, and encourage new and innovative ideas. We build our work *Right First Time*.



### 1.2 PLAN MANAGEMENT

This Project summary is presented at the start of each Appendix to serve as a quick reference to our core values, the Project overview, our Team’s composition, and our Key Personnel and Critical Staff. We developed each Appendix to demonstrate our understanding of the Project requirements and facilitate timely Approval by the Department after award.

This document describes KMP’s approach for the Work. KMP resubmits this Plan, including an updated Project summary, to the Department as required per the Project Agreement.

All Project plans, including this document, are stored electronically per KMP’s Document Control System (DCS) Plan. Revisions to these documents may be required as the Project progresses, and annual updates are completed in accordance with Section 4.2 of the Project Management Plan (PMP). The latest revision of all Management Plans are be stored per KMP’s DCS and submitted to the Department through Aconex.

### 1.3 OVERVIEW

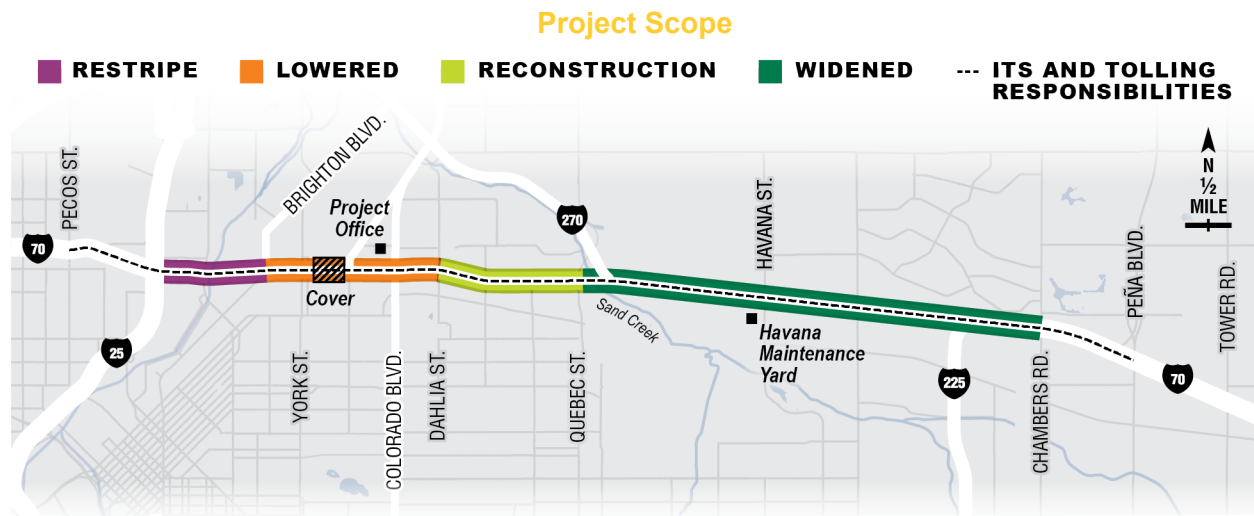
The Project is a Public-Private Partnership to design, build, finance, operate, and maintain planned improvements to the I-70 corridor between I-25 and Tower Road.

The Project’s scope is broken down into the following timeframes:

#### Project Time Frames

Time Frame	Period	Description	Estimated Duration
Notice of Award to NTP1	Submittals	Plan development, submittals, and mobilization of Quality Management staff	3 months
NTP1 to NTP2	Construction	Financial Close and Design	6 months
NTP2 to Substantial Completion	Construction	Construction and O&M During Construction (other than snow and ice control services)	45 months
Pre-Substantial Completion to Substantial Completion	Transition	Transition from Construction to Operating Period, and O&M submittals	8 months
Substantial Completion to Final Acceptance	Operating	Final submissions and inspections	4 months
Substantial Completion to Expiry Date	Operating	Operations and Maintenance (including Renewal Work)	30 years
NTP3 to Term	Construction, Operating	KMP snow and ice control services	33-34 years
62-68 months prior to Expiry Date	Operating	Handback Inspections, Handback Work, and Department training to facilitate seamless handover at Expiry Date	62-68 months

Improvements made by KMP during the Construction Period, highlighted in the figure, are described below.



### 1.3.1 RESTRIPE: I-25 TO BRIGHTON BOULEVARD

Restriping I-70 from I-25 to Brighton Boulevard to accommodate one managed lane in each direction, including:

- Design and Construction for improvements to associated drainage infrastructure

### 1.3.2 LOWERED: BRIGHTON BOULEVARD TO DAHLIA STREET

Full reconstruction of I-70 between Brighton Boulevard and Dahlia Street, including:

- Removing the viaduct between Brighton Boulevard and Colorado Boulevard, and reconstructing the Interstate below grade to accommodate the Ultimate Project roadway configuration and associated elements
- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing the Interstate structures over Brighton Boulevard
- Constructing the Cover and associated elements over the Interstate between Columbine Street and Clayton Street
- Constructing cross-street structures at York Street, Josephine Street, Columbine Street, Clayton Street, Fillmore Street, Steele Street/Vasquez Boulevard, Cook Street, Monroe Street, and Colorado Boulevard
- Constructing I-70 Mainline structures at Dahlia Street
- Removing one Railroad structure, and Constructing two Railroad structures at Union Pacific Railroad (UPRR) and BNSF Railway (BNSF)

### 1.3.3 RECONSTRUCTION: DAHLIA STREET TO SAND CREEK

Full reconstruction of I-70 Mainline between Dahlia Street and Sand Creek, including:





- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing Interstate structures over Holly Street, Monaco Street, Denver Rock Island Railroad, and Quebec Street

#### 1.3.4 WIDENED: SAND CREEK TO CHAMBERS ROAD

Widening I-70 from Sand Creek to Chambers Road with associated elements, including:

- Adding one managed lane in each direction with supporting infrastructure to accommodate a second managed lane in the Ultimate Project roadway configuration
- Removing and replacing the I-270 flyover structure to I-70 eastbound
- Removing and replacing Interstate structures over Peoria Street

#### 1.3.5 INTELLIGENT TRANSPORTATION SYSTEMS (ITS) AND TOLLING RESPONSIBILITIES

Additional ITS and tolling responsibilities, including:

- Closed circuit television (CCTV) camera coverage for I-70 corridor, including interchanges between Pecos Street and Airport Boulevard
- Microwave vehicle radar detection between Pecos Street and Tower Road
- Travel time indicators between Pecos Street and Tower Road
- Lane use signals between Pecos Street and Chambers Road
- Dedicated short range communications radios between Pecos Street and Tower Road

#### 1.3.6 OPERATIONS AND MAINTENANCE (O&M) WORK DURING CONSTRUCTION

Operations and maintenance of existing infrastructure within the O&M Limits During Construction as defined by the Project Agreement, including:

- I-70 Mainline and associated infrastructure
- Local Agency infrastructure
- Drainage
- Water quality
- ITS and electronic toll collection facilities
- Utility services
- Traffic signals and lighting
- Railway structures
- Fencing
- Snow and ice control services (following NTP3)

#### 1.3.7 OPERATIONS AND MAINTENANCE WORK DURING THE OPERATING PERIOD

Operations and maintenance of I-70 within the limits defined by Schedule 11 of the Project Agreement for the Operating Period (dashed line in figure above), including:

- Providing resources to safely maintain the roadway throughout the Term

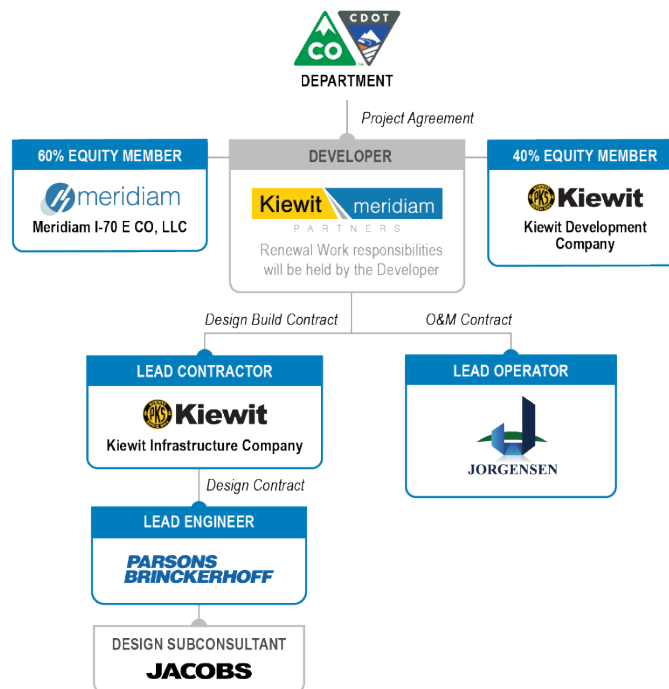
- Asset preservation including repair and Renewal
- Snow and ice control services
- Courtesy patrols
- Incident response
- Meet Handback requirements

### 1.4 KIEWIT-MERIDIAM PARTNERS COMPOSITION

KMP organized a streamlined Team to successfully deliver the Central 70 Project. The Core Proposer Team Members of Meridium, Kiewit, Parsons Brinckerhoff, and Jorgenson are united by a commitment to Project success under a common project management system. KMP’s lean approach has been cultivated from a history of working together, and by our shared cultures of safety, quality, environmental stewardship, and community service. The KMP Team needs no learning curve to start working together, and is positioned to execute on our joint Project delivery commitments from day one.

KMP’s equity members—Meridium and Kiewit Development Company—formed KMP for the sole purpose of developing this Project. KMP’s Core Proposer Team Members, shown below, include Kiewit Infrastructure Company (KIC) as the Lead Contractor, Roy Jorgensen Associates (Jorgensen) as Lead Operator, and Parsons Brinckerhoff (PB) as Lead Engineer. Our Team is supported by the expertise of subconsultants and subcontractors who possess additional local knowledge and experience, including Jacobs as PB’s main Design subconsultant. KMP is committed to identifying opportunities to maximize the involvement of small and disadvantaged businesses. Throughout the Project, KMP remains the single point of responsibility for meeting all Project Agreement requirements.

KMP co-locates with the Department in both the Project Office and the Colorado Transportation Management Center (CTMC) to foster a collaborative approach that ensures we meet the Department’s Project goals throughout the Project.





### 1.5 KEY PERSONNEL AND CRITICAL STAFF

The table below shows KMP’s Key Personnel overseeing the Project. KMP has also identified positions, and individuals, as Critical Staff who are instrumental in the successful delivery of the Project.

#### Key Personnel and Critical Staff

Staff Type	Title	Name	Employed by	Seconded to
KEY PERSONNEL	Project Manager	Chris Hodgkins	Meridiam	KMP
	Design-Build Manager	Tom Howell	KIC	
	Construction Manager	Barry Thoendel	KIC	
	Design Manager	Doug Andrew, PE	PB	
	O&M Manager	Abraham Henningsgaard, PE	Jorgensen	
	Project Quality Manager	Gordon Peterson, PE	KIC	KMP
	Independent Design Quality Manager	James Rozek, PE	PB*	
	Construction Process Control Manager	Sean McAfee	KIC	
	Independent Quality Control Manager	Tracy Martin, PE	KIC*	
	Environmental Manager	Jenn Bradtmueller, PE	KIC	KMP
	Utilities Manager	Kevin Custy	Jacobs	KIC
	Project Communications Manager	Hunter Sydnor	KIC	KMP
CRITICAL STAFF	Technical Manager	Martin Currie	KDC	KMP
	Financial Manager	Christopher Couallier	Meridiam	KMP
	Safety Manager	Ben Snow	KIC	KMP
	Construction Safety Manager	Kenyon Manley	KIC	
	Civil Rights Program Manager	Matt Christensen	KIC	
	DBE/ESB Program Manager and Outreach Training Manager	Colean Bembry	KIC	
	Lead Scheduler	Mauricio Solano	KIC	
	Design Integration Manager	Tim Nelson	KIC	
	Deputy Design Manager	Mark Talvite, PE	Jacobs	
	Cover Design Manager	Heath Therrien, PE	PB	
Commercial Manager	Jamie Harvey, PE	KIC		

*\*Per Approved ATC 9.1 (see Attachment to the Quality Management Plan), KMP shall use in-house personnel in lieu of employees from an Independent Quality Control Firm*

## 2. Introduction: Environmental Compliance Work Plan

KMP's approach to environmental stewardship, and compliance with Environmental Requirements and the Project Agreement, addresses the specific challenges and opportunities throughout the Design, Construction, and Operational period of the Project. We understand that this Project is located in neighborhoods where residents are concerned about environmental impacts to their health, quality of life, and livelihoods; and the lengthy nature of the environmental permitting process has caused added concern and doubts among some. We are excited, energetic, and enthusiastic about our environmental program, and how its careful implementation contributes to the larger goals of community and neighborhood enhancement and economic development. KMP and all of our Team members are committed to meeting the requirements of the Project Agreement, and exceeding key environmental obligations of the Record of Decision (ROD) to help improve safety, access, and mobility for residents, commuters, businesses, and stakeholders.

As good corporate citizens, KMP follows and enforces environmental regulations on the Project that ensure air, land, and water quality; protect the habitat of wildlife and valued vegetation; and minimize disruption to residents and businesses from dust, construction vehicle activity and emissions, noise and light pollution, and other negative impacts.

KMP's Environmental Manager, Jenn Bradtmueller, ensures compliance with the Environmental Requirements and commitments, and implements environmental Design, Construction, and Operational commitments; Environmental Requirements; and conditions of the Environmental Approvals for the Project.

Jenn has more than 14 years of experience managing environmental programs for multimillion and billion dollar transportation infrastructure projects, and works effectively with Design, Construction, and Operating staff. She brings Best Management Practices (BMPs) to achieve on-time permit approvals, and ensure compliance with environmental regulations. Jenn has managed environmental programs for signature projects such as the I-225 Light Rail, Pecos Bridge over I-70, and Denver Union Station (DUS) Transit Improvements. On the \$355 million design-build DUS project, she was responsible for stormwater control, dewatering of contaminated groundwater, hazardous and non-hazardous waste management, asbestos and lead-based paint management, air quality control, and compliance with the Emergency Planning Community Right to Know Act. Under her hands-on management, DUS won the **Colorado Contractor Association's (CCA's) Environmental Excellence Award**.

Jenn has established relationships with federal, state, and local permitting agencies, including CDOT, the Colorado Department of Public Health and Environment (CDPHE), Colorado Parks and Wildlife (CPW), US Army Corps of Engineers (USACE), and US Fish and Wildlife Service (USFWS). She is active in local community and professional organizations, including the Associated General Contractors of America Environmental Steering Committee, and the CDOT Innovative Contracting Advisory Committee Environmental Subcommittee.



## 2.1 KMP ENVIRONMENTAL GOALS

KMP creates environmental awareness among all Project personnel, completes environmental tasks and mitigation, and documents that environmental aspects of the Construction Work and the O&M Work are completed in accordance with all applicable Environmental Laws, Approvals, and provisions of Schedule 17, and other relevant sections of the Central 70 Project Agreement.

The figure below indicates goals developed by KMP to focus and drive our Team’s daily actions throughout the Project:

Environmental Goals
Meet or exceed the requirements of the Project Agreement and Environmental Requirements
Satisfy ROD commitments and mitigation measures
Minimize disruption and environmental impacts to residents, commuters, wildlife, and vegetation along the corridor
Maintain a strong and collaborative working relationship with Stakeholders to ensure that environmental issues are resolved quickly and effectively
Work in partnership with the Department and environmental regulatory agencies to develop and deliver a model environmental program for Construction of the Project

KMP has a vested interest in taking an enlightened and comprehensive approach to environmental protections, one that eases the inherently disruptive process of Construction. We are not only the Developer of the Project, but residents of the neighborhoods along the Project corridor, patrons of community businesses, and parents whose children attend schools near the path of Construction; we carry a personal interest in the Project’s success.

This Environmental Compliance Work Plan (ECWP) identifies the people leading KMP’s Environmental Management Team during Construction, and defines the processes and procedures KMP uses to develop effective solutions, and to work collaboratively in meeting the Environmental Requirements and commitments. KMP’s final ECWP, submitted to the Department for Approval prior to issuance of Notice to Proceed 2 (NTP2), identifies the environmental goals and compliance requirements for Construction of the Project, and provides a detailed plan to meet or exceed those goals and requirements.

The ECWP is updated before Project substantial completion and submitted to the Department for Approval, identifying the people who will lead the KMP Environmental Team during the Operating Period.

## 2.2 DISCIPLINE SPECIFIC MANAGEMENT PLANS

The ECWP describes our overall environmental management program, and includes the discipline specific management plans indicated in the following figure. These plans are not included in this draft ECWP, but are included in our submission prior to issuance of NTP2. The figure below indicates which plans are submitted for Acceptance and which for Approval, in accordance with Table 17-5 of Schedule 17, Environmental Requirements.

### Additional ECWP Management Plans

Discipline Specific Management Plan	Acceptance/Approval
<b>Air Quality Monitoring, Maintenance, and Mitigation Plan (AQ3MP)</b>	Acceptance; prior to issuance of NTP2; updated annually
<b>Construction Noise Mitigation and Monitoring Plan (CNMMP)</b>	Acceptance; prior to issuance of NTP2; updated annually
<b>Integrated Noxious Weed Management Plan (INWMP)</b>	Acceptance; prior to issuance of NTP2; updated annually
<b>Materials Management Plan (MMP)</b>	Approval; prior to issuance of NTP2; updated annually
<b>Sampling and Analysis Plan (SAP)</b>	Approval; prior to issuance of NTP2; updated annually
<b>Health and Safety Plan (HASP)</b>	Acceptance; prior to issuance of NTP2; updated annually
<b>Spill Prevention Control and Countermeasure (SPCC) Plan</b>	Acceptance; prior to issuance of NTP2; updated annually
<b>Black-tailed Prairie Dog (BTPD) Management Plan</b>	Acceptance; prior to conducting activities that could potentially impact BTPD; updated annually

### 2.3 ECWP UPDATES

KMP’s Environmental Team monitors and improves the effectiveness of the ECWP, and resubmits it annually to the Department for Approval or Acceptance. Annual updates of our ECWP are submitted for Approval on the anniversary of the ECWP’s initial Approval by the Department, or more frequently if:

- A plan or procedure no longer adequately addresses the matters it was originally intended to address
- A plan or procedure does not conform with the Project Agreement
- Performance or self-monitoring programs identify alternative or improved methods of operation
- An audit by KMP or the Department identifies a deficiency in the ECWP requiring an update
- Organizational structure changes require revision to the ECWP
- KMP is undertaking, or about to undertake, activities that are not covered by the current ECWP
- Department request

For all ECWP updates submitted to the Department, including updates to discipline specific management plans, KMP clearly identifies in a cover sheet the changes made, in order to expedite the Department’s review. We also provide a redline copy and a clean copy for comparison.



### 3. Environmental Elements (2.1.1.a)

KMP complies with the environmental elements defined in the “Summary of Impacts and Mitigation for the Preferred Alternative” table in the ROD. See Attachment 1, Environmental Commitments for a list of planned mitigation measures.

As discussed in Section 7; Tracking and Documenting of the ECWP, a status update on the completion of mitigation measures is provided in the monthly Environmental Status Report (ESR).

### 4. Elements Assigned to KMP

KMP complies with the elements assigned to the Developer in *the I-70 East Mitigation Measures Status*, as provided in the Reference Documents. As discussed in Section 7, a status update on the completion of these, and other mitigation measures that KMP is responsible for, are provided in the monthly ESR.

### 5. Environmental Law and Environmental Approvals

In addition to the mitigation commitments, KMP ensures that the Project is designed and constructed in compliance with Environmental Laws, and Environmental Approvals. To track these commitments, all requirements are included in KMP’s Environmental Matrix.

Our approach to managing Environmental Laws and Approvals as they apply to this Project are discussed below.

#### 5.1 ENVIRONMENTAL LAWS

The KMP Environmental Management Team has extensive experience working with the Environmental Laws that form the Project’s environmental commitments and requirements. Key Environmental Laws applicable to the Project are listed in the figure below. The Environmental Manager (EM) reviews all applicable requirements for these laws, and puts these requirements into KMP’s Environmental Matrix prior to NTP2, as described in Section 6.2.2 below. In addition, the EM monitors current and future regulations and incorporates any relevant changes into the environmental matrix.

The individual management plans supporting this ECWP include specific measures to comply with these Environmental Laws and our overall approach to environmental management.



## Representative Environmental Laws

- ◆ National Environmental Policy Act (NEPA) of 1969 Evaluation of relevant environmental effects of a federal project or action undertaking
- ◆ 40 CFR 122 U.S. Environmental Protection Agency (EPA) Administered Permit Programs Colorado Discharge Permit System
- ◆ Federal Highway Administration (FHWA) Regulation 23 CFR 772 "Procedures for Abatement of Construction Noise and Highway Traffic Noise"
- ◆ Noise Program Book, Colorado Department of Transportation (CDOT), March 2015
- ◆ Title 5 Code of Colorado Regulations (1001) Air Quality Control Commission
- ◆ Erosion Control and Stormwater Quality Guide, CDOT, July 2014
- ◆ Comprehensive Environmental Response Compensation and Liability Act (CERCLA), December 1980
- ◆ Resource Conservation and Recovery Act (RCRA), 1976
- ◆ Colorado Environmental Cleanup Guidance and Policy
- ◆ Colorado Department of Labor and Employment, Division of Oil and Public Safety, Storage Tank Regulations (7 C.C.R. 1101-14)
- ◆ Occupational Safety and Health Administration (OSHA) 40 CFR, 1910.120, related to Hazardous Waste Operations and Emergency Response (HAZWOPER) training
- ◆ Endangered Species Act (ESA), 1973
- ◆ State-Listed Threatened and Endangered Species (2 C.C.R 406-10)
- ◆ Section 401 of the Clean Water Act (CWA) of 1972, including the 401 Water Quality Certification through the Colorado Department of Public Health and Environment (CDPHE)
- ◆ CDPHE Basic Standards and Methodologies for Surface Water (5 C.C.R. 1002-031)
- ◆ Colorado's Section 303(d) List of Impaired Waters and Monitoring Evaluation List (5 C.C.R.1002-093)
- ◆ Section 402 of the CWA of 1972 National Pollutant Discharge Elimination System (NPDES), enforced in Colorado by the CDPHE as the Colorado Discharge Permit System
- ◆ Section 404 of the CWA of 1972 Regulates discharges of dredged or fill material into waters of the United States, as defined by the United States Army Corps of Engineers (USACE)
- ◆ Section 408 of the CWA Permits and Compliance Plans
- ◆ Executive Order 11988 (Floodplain Management), Federal Emergency Management Agency (FEMA)
- ◆ 23 CFR 650.113 Encroachment on floodplains
- ◆ Migratory Bird Treaty Act of 1918 (MBTA)
- ◆ Colorado Division of Wildlife Senate Bill 40 Wildlife Certification (33-5-101, CRS)
- ◆ Executive Memorandum on Environmentally Beneficial Landscaping, and Executive Order 13112 on Invasive Species, February 1999
- ◆ Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended
- ◆ Section 4(f), U.S. Department of Transportation Act, 1966
- ◆ CDOT Standard Specifications for Road and Bridge Construction (2011), Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act of 1973





## 5.2 ENVIRONMENTAL APPROVALS

KMP understands the Environmental Approvals processes for complex transportation infrastructure projects, and knows how to efficiently obtain the permits required for projects of this nature.

In accordance with Section 8.4.2.a of the Project Agreement, KMP obtains all Environmental Approvals (other than Department-provided Approvals) required to perform our obligations under the Project Agreement. The following figure provides a non-exhaustive list of Approvals; KMP obtains any additional Environmental Approvals not included below, as and when required, and performs all necessary actions associated with Governmental Approvals and Permits. This includes, in certain circumstances, obtaining new, modifications, renewals, and extensions of existing Governmental Approvals (including Department Provided Approvals) and Permits.

### Non-exhaustive list of Environmental Approvals

Environmental Approvals	Permitting Agency Approval Agency
Record of Decision and Section 4(f) Evaluation	FHWA
Programmatic Agreement	State Historic Preservation Office (SHPO) and FHWA
Stationary Source Air Quality Permit	CDPHE Air Pollution Control Division (APCD)
Fugitive Dust Permit	CDPHE, APCD
Asbestos Abatement Permit	CDPHE, APCD
Demolition permits	CDPHE and all applicable Governmental Authorities
Historic Structures Demolition Permit	City and County of Denver (CCD) Landmark Preservation Commission
Construction Noise Permit	All applicable Governmental Authorities
Temporary Noise Variance	All applicable Governmental Authorities
Construction Activities Stormwater Discharge Permit (CASDP)	CCD Wastewater Management
Colorado Discharge Permit System (CDPS) Stormwater Construction Permit (SCP)	CDPHE Water Quality Control Division (WQCD)
Subterranean Groundwater Permit	CDPHE WQCD
Construction Dewatering Permit	CDPHE WQCD
Remediation Activities Discharging to Surface Waters Permit	CDPHE WQCD
Remediation Activities Discharging to Groundwater Permit	CDPHE WQCD
Individual Permit	CDPHE WQCD
Substitute Water Supply Plan	Colorado Division of Water Resources
Notice of Intent to Construct Dewatering Wells	Colorado Division of Water Resources
Well Construction and Test Reports	Colorado Division of Water Resources

Environmental Approvals	Permitting Agency Approval Agency
Dewatering Systems Well Report	Colorado Division of Water Resources
Notification as RCRA Generator as defined by the Project Agreement	CDPHE Hazardous Materials and Waste Management Division
Stormwater Quality Discharge Permit for Construction Activities	City of Aurora
Sewer Use and Drainage Permit (SUDP)	CCD
Well Abandonment Report (GWS-09)	State of Colorado, Office of State Engineer
Black-tailed Prairie Dog (BTPD) Removal Permit	Colorado Parks and Wildlife (CPW) and City of Aurora
SB40 Certification Approval	CPW
Nest Take Permit	United States Fish and Wildlife Service (USFWS)
CWA Section 404 Permit	USACE
Special Use Permit	CDOT

In addition to obtaining the Approvals noted above, KMP meets the environmental requirements for specific environmental resources as described in Schedule 17, coordinates with the Department, and observes the reporting protocols noted in Attachment 1.

## 6. Means and Methods (2.1.1.d)

KMP’s ECWP describes our overall approach to environmental compliance. The individual plans within our ECWP provide detailed information regarding compliance with Environmental Laws and Requirements, and describe the means and methods to manage specific issues and hazards, such as dewatering in both the Construction and Operating Periods, and obtaining any Government Approvals for removal, management, and disposal of Recognized Hazardous Materials (RHMs). Our EM coordinates the implementation of procedures described in our ECWP and supporting plans to ensure the Project Team and field personnel understand their responsibilities for meeting Environmental Requirements

We use the following means and methods to ensure compliance with all Environmental Requirements during both the Construction and Operating periods:

- Design is reviewed for compliance with all Environmental Requirements prior to Construction and Renewal Work
- Environmental Task Force Meetings are held on a weekly basis during Construction and as-needed during the Operating Period.
- Field supervisors conduct weekly tool box trainings. All employees are trained at a job-site training.
- Task-specific Work Plans are created for field crews when installing, repairing, and/or removing BMPs or other environmental-related scopes of work.
- Routine inspections required by permit, and KMP-required inspections are completed and documented electronically through InEight Project Suite, and seamlessly transmitted to the Department via Aconex.



- Routine KMP internal environmental audits are completed to make sure office and field crews are complying with all regulations and permits. These internal Environmental audits are completed by district and corporate environmental management not assigned to the Project, allowing an independent look at KMP's performance and areas where we can improve.
- Environmental management and compliance performance are a standing agenda topic during Executive Oversight Committee meeting between KMP and the Department
- RHM status updates are held with Department bi-weekly.
- Water Quality as an agenda item to the Environmental Meeting
- All Work Plans for Construction activities include an Environmental section that is reviewed by the Environmental Team.
- Quality Meetings are held weekly. On a quarterly basis, the KMP Team reviews the Four Square matrix to communicate issues and trends on the Project.

## 6.1 ENVIRONMENTAL COMPLIANCE AND MITIGATION TRAINING PROGRAM

KMP ensures environmental compliance and the incorporation of environmental commitments during Construction through a comprehensive environmental compliance and mitigation training program (ECMTP). Training is provided: 1) during new hire training; 2) on an as-needed basis, or 3) in response to conditions within the Project area. All supervisory and craft personnel, including those of subcontractors, who enter the Project Limits to perform Construction Work on the Project must have completed this training.

The ECMTP trains personnel on the Environmental Requirements for the Project, and how to stay in compliance with those requirements. The ECMTP covers additional topics, as needed, to maintain compliance, and includes additional training for production supervisors and inspectors who are responsible for environmental compliance.

Our EM implements the ECMTP Plan and submits it to the Department for Acceptance prior to NTP2. After NTP2, training occurs prior to personnel being permitted Onsite. Personnel (staff and craft) hired during the course of the Project are trained as part of their new hire training. Construction Work conducted prior to NTP2 is conducted under the Environmental Requirements of the CDOT Special Use Permit and is otherwise subject to the early access and use provisions identified in Section 1.2 of Schedule 18, Right-of-Way.

The EM revises the ECMTP regularly to reflect the most current policies, rules, and regulations, and to provide annual updates to the ECMTP for submittal to the Department for Acceptance 30 days after the end of each Contract Year. KMP's Environmental Team keeps records of the number of training sessions held, and the staff who have completed the ECMTP (for example, through sign-in sheets, employee-specific identification numbers, and hard hat decals), and reports this information monthly in the ESR.

Training in the ECMTP includes the following elements:

- Water quality requirements
- Wetlands and waters of the US
- Maintaining Approved Limits of Disturbed Areas (LDA)
- Tree and shrub protection
- Avoidance and minimization of impact to waterways and stormwater conveyances
- Seasonal work restrictions on trees, waterways, and migratory birds
- Pumping and dewatering operations

- Discovery of archaeological material or human remains
- Discovery of paleontological resources
- Hazardous substances
- Historic property protection requirements
- Construction noise mitigation
- Dust and construction emissions mitigation
- Site general housekeeping measures
- Waste material management
- Spill prevention, response, and cleanup
- Protection and access requirements for parks, and maintenance of trail detours
- Impacts and consequences for departure from Approved operating procedures
- Additional topics, as needed, to maintain compliance with the Environmental Requirements
- Responsibilities of production supervisors and inspectors in connection with environmental compliance

In accordance with Schedule 17, Section 23.11.2, KMP is responsible for ensuring relevant workers complete the 2-Hour Asbestos Awareness Training in accordance with OSHA 29 CFR 1926.1101, documenting OSHA training, and implementing OSHA requirements for the Work.

The figure below provides a summary of the training KMP anticipates to deliver through our ECMTF.

### Anticipated Training Programs Outlined in KMP's ECMTF

Personnel Group	Training Type Focus	Frequency of Training	Frequency of Updates
Suppliers (Field office and common materials storage areas)	Educational flyers that include environmental compliance information with signature verification of understanding	Upon initial arrival	Information to be updated as needed
Suppliers (Deliveries to materials storage areas in Project area)	Educational flyer that includes environmental compliance information; implementation of informational signage, vehicle escorts, and flagging within Project area	Upon each arrival with vehicle escorts, as needed	Information to be updated as needed
Designers	Environmentally sensitive areas	Prior to and after NTP2 in response to new hires	As needed and in response to new hires
Maintenance Personnel	Environmentally sensitive areas; 2-Hour Asbestos Awareness Training in accordance with OSHA 29 CFR 1926.1101; Project contact information and notification protocol; weekly Tool Box Trainings.	Prior to initial access of Project area; environmental compliance reminders included in daily Work Plans	As needed and in response to new hires; reminders provided as part of Approved Work Plans
Craft Personnel	Environmentally sensitive areas; 2-Hour Asbestos Awareness Training in	Prior to initial access of Project area; environmental	As needed and in response to new hires; reminders provided as



Personnel Group	Training Type Focus	Frequency of Training	Frequency of Updates
	accordance with OSHA 29 CFR 1926.1101; Project contact information and notification protocol; weekly Tool Box Trainings.	compliance reminders included in daily Work Plans	part of Approved Work Plans; RHM training during Construction Period
Executives, field supervisors, project managers, public informant and EM Team	Comprehensive ECMTP, review of components of the ECWP	Prior to and after NTP2 in response to new hires	As needed and in response to new hires

Comprehensive and customized training for all levels of Project personnel ensures workers are aware of their responsibility to comply with Environmental Requirements. KMP’s Environmental Management Team also provides weekly and, if needed, daily briefings for the Project Management Team regarding environmental commitments.

## 6.2 INEIGHT PROJECT SUITE

InEight Project Suite is a project control cloud-based system used to track both reportable incidents and the regulatory requirements associated with a specific project.

### 6.2.1 REPORTABLE INCIDENTS

All reportable incidents must be recorded in InEight Project Suite within 24 hours of occurrence. Employees answer a questionnaire about the incident and, once submitted, a notification is sent to both the District Environmental Manager (DEVM) and the Kiewit Home Office. Every project is automatically set up in InEight Project Suite once a project begins, and each employee has access to InEight Project Suite at the start of employment. Once incidents are entered, the information can be retrieved in an Excel spreadsheet on an as-needed basis.

## Spill Release Reporting

### 18.2 Spilled/Released Material:

Other:

### 18.3 Where did spill/release originate (ex: tank, drum, hose, etc.)

- Barge
  - Drum
  - Equipment
  - Tank
  - Truck
  - Other
- Unit #: (Optional)

Make /Model: (Optional)

### 18.4 Spilled/Released To

Spill/Released To:

### 6.2.2 ENVIRONMENTAL MATRIX

All regulatory requirements can be tracked in InEight Project Suite. Information about each permit, regulation, or contract requirement is input into InEight Project Suite. Associated actions for each regulatory requirement are developed, and assigned to a specific employee who is responsible for that requirement. When an action is due, a notification is emailed out to the employee responsible. In addition, as a regulatory requirement is about to expire, a notification email is sent out 60 and 30 days in advance. All associated documentation can be uploaded and attached within InEight Project Suite. Once all requirements are added into InEight Project Suite, the resulting Environmental Matrix can be downloaded in an Excel spreadsheet on an as-needed basis. The Environmental Matrix is discussed in more detail in Section 9.2 below.

### 6.2.3 FORMS

InEight Project Suite is used to create forms that can be filled out electronically from any computer or mobile device. Electronic forms can include photographs taken during an inspection, and can be submitted directly from a mobile device. Forms are then synchronized to a library and seamlessly transferred to the Department's Aconex system. These forms can be filled out while in the field and uploaded later, as the app also works offline.



## 6.2.4 SUSTAINABILITY

KMP tracks all events the company participates in, including LEED and Envision certifications, America Recycles Day, and Earth Day events. This information is kept in an electronic database via a one-page questionnaire. KMP also has adopted one of the key strategies of Kiewit's sustainability program, the Idling Policy. Under this policy, vehicles and equipment are not allowed to idle longer than five minutes, reducing fuel consumption, diesel emissions, and noise, as well as decreasing vehicle and equipment maintenance. In addition to implementing the Idling Policy, KMP looks for opportunities to partner with local organizations, such as Habitat for Humanity, to reuse or repurpose demolition materials from the Project. By utilizing InEight Project Suite, KMP reduces the amount of paper used on the Project, working toward the goal of being a paperless Project.

### IDLING POLICY

It is the KMP policy to comply with all laws and regulations, and to adopt best practices to protect and preserve the environment. To reduce emissions and conserve fuel, it is imperative that we limit the operation of our internal combustion powered vehicles and equipment whenever possible. Therefore, unless higher standards are required by applicable laws and regulations in a specific jurisdiction, all vehicles and equipment owned, leased, rented, or otherwise under our control shall not be allowed to idle for more than five (5) consecutive minutes, unless:

- Idling when in operations queuing
- Idling to verify safe operating condition
- Idling for testing, servicing, repairing, or diagnostic purposes
- Idling necessary to accomplish work for which the vehicle/equipment was designed (such as operating a crane)
- Idling to reach required operating temperatures by manufacturers' specifications
- Idling necessary to ensure safe operations of the vehicle/equipment

KMP enforces the Idling Policy using telematics, including automated vehicle location (AVL) devices, which are installed on all Kiewit-owned equipment, and O&M and snow removal vehicles. Telematics has many benefits including:

- Reducing unnecessary idling
- Reducing fuel consumption
- Right-sizing fleet through tracking utilization
- Maximizing productive use of equipment
- Providing real-time vehicle locations



### 6.3 TASK-BASED WORK PLANS

Discipline superintendents provide task-based Work plans to the Environmental Team for review during Construction. During the Operating Period, KMP's Technical Manager and O&M Manager coordinate with the Environmental Team to prepare required Work Plans associated with active maintenance, operations, or Renewal Work. The EM, or designee, reviews these Work plans to ensure compliance with Environmental Requirements. This level of oversight confirms that individual tasks are compliant, and ensures that, when necessary, additional mitigation, such as archeological monitoring, biological surveys, or environmental approvals can be completed.

The list below shows typical details of a task-based Work plan that the field crews populate before EM review:

- Identify scope of work to be completed
- Provide step-by-step procedures for the environmental operation
- Identify environmental safety hazards and precautions for each hazard identified
- Identify environmental specifications
- Identify environmental quality tolerances
- Identify environmental quality risks and prevention measure
- Identify environmental quality hold points
- Attach environmental checklists, if required
- Identify equipment required
- Identify manpower required
- Include pictures, drawings, and typical sections required to complete operation

### 6.4 COMPREHENSIVE ENVIRONMENTAL AUDITS

KMP conducts environmental compliance audits following the American Society for Testing Materials (ASTM) E2107-06 Standard Practice for Environmental Regulatory Compliance Audits. The environmental audits address applicable statutory and regulatory environmental requirements. The results are evaluated to improve training and identify applicable efficiencies for best practices.

## 7. Tracking and Documenting

KMP uses InEight Project Suite to document the progress and completion of Environmental Requirements throughout the Construction and Operating periods. InEight Project Suite can be used on a mobile device from the field to document inspections and alert the Environmental Team in real time to issues that require attention, thereby speeding resolution. Any form required by the Department can be created in InEight Project Suite and uploaded to Aconex, with automatic alerts notifying the Department of newly posted information. We collaborate with the Department, and provide the Department with appropriate training on the use of InEight Project Suite for documenting progress, completion, and compliance.

KMP informs and consults with the Department on all environmental mitigation and remediation issues, and coordinates with applicable governmental entities to ensure compliance with all permits, commitments, and approvals.





## 7.1 ENVIRONMENTAL STATUS REPORTS (ESRS)

From NTP1 through Substantial Completion, KMP documents the status of activities undertaken in accordance with Environmental Requirements, and submits an ESR to the Department monthly during Construction, and quarterly during the Operating Period. The ESR includes the following, as well as any other content requirements specified in Schedule 17 or other sections of the Project Agreement:

- Current status of compliance with the Environmental Requirements
- Water quality protection activities that have occurred during the reporting period, and a statement certifying KMP's compliance with the Colorado Discharge Permit System Stormwater Construction Permit (CDPS-SCP), CDOT's MS4 Permit, and CDOT's Standard Specifications for Water Quality Control and Erosion Control. Note that from NTP1 through the second anniversary of Final Acceptance, the certification statement is signed by the EM. After the second anniversary of Final Acceptance through the end of the Operating Period, the certification statement is signed by the Project Manager. If the certification statement cannot be signed, a separate Corrective Action Plan is submitted for Approval.
- Documentation regarding compliance with Colorado Division of Water Resources for all temporary dewatering activities
- Pertinent environmental issues, and a narrative of the compliance actions and environmental activities
- Summary of stakeholder and Governmental Authority communications
- Summary of plan sets and submittals that have undergone environmental cross-disciplinary review since the last ESR
- Dated photographs documenting environmental compliance and activities
- Summary of reviews of KMP Change Notices, and documentation of due diligence performed by the EM
- Summary of number and severity of nonconformances with Environmental Requirements, including strategies to reduce the number and severity of future nonconformances
- Summary of Work conformance with the Environmental Requirements

The ESR includes enough detail to fully document environmental activities. If the Department requests additional information, the ESR is revised and resubmitted for Acceptance.

In addition, KMP's Environmental Team submits a Mitigation Completion Report upon completion of all Environmental Requirements and environmental activities associated with Construction Work. The Mitigation Completion Report documents and certifies the completion of all Environmental Requirements, including environmental mitigation, and is submitted for Department Acceptance prior to Final Acceptance.

## 8. Process Control and Independent Quality Control Programs

The ECWP and all environmental activities are monitored for compliance with the Project Agreement, per the Project's Quality Management System. Specifically, the quality of the ECWP and associated plans are monitored in accordance with the Quality Management Plan (QMP) and the Administrative Quality Management Plan.

Our Project QMP includes both Process Control (PC) activities and Independent Quality Control (IQC) activities. PC activities are carried out by individuals performing the Work. IQC actions are carried out by individuals who are not associated with the Work (see Appendix D)

Process Control (PC) performs the following:

- Specification review of the Project Agreement to check against the Environmental Matrix
- Selection of subcontractors and subconsultants, as outlined in the Project Quality Management Plan (see Appendix D)
- Self-inspection of the Work for compliance with the Project Agreement

Independent Quality Control (IQC) performs the following to ensure compliance with the Project Agreement, CDPS-SCP, CDOT's MS4 permit, and CDOT Standard Specifications:

- Inspect and test environmental field operations
- Complete water quality inspections
- Complete water quality field reviews
- Issue Nonconformance Reports (NCRs), as required, to bring Project into compliance
- Audit Stormwater Management Plan (SWMP) Notebook monthly from NTP2 through Final Acceptance. The material to be audited includes CDOT Form 1176 and all items required in Standard Specification 208.03(d)1. As part of this audit, all such items required in Standard Specification 208.03(d)1, Form 1176 Inspection Reports, documentation of the corrective action for any findings, Form 105, all other correspondence relating to water quality, and any reports of reportable spills submitted to CDPHE is scanned and entered into the document control system (DCS). KMP submits a summary of the audit, any audit findings, and the scanned material to the Department monthly.

## 9. Compliance Tracking (2.1.1.g)

Information related to progress, completion, and compliance with Environmental Requirements is seamlessly communicated to the Department's Aconex document control system, and recorded through InEight Project Suite, and serves as a secure document control system to store, organize, and share information that can be accessed from almost any device using Internet Explorer, Chrome, or Firefox. The benefits of using InEight Project Suite to store Project-related information in a single place include:

- A secure, password-protected website
- A cloud platform with web-based interface
- A custom directory structure
- Open upload and download features
- A printable list of documents
- Automatic emails when files are added, modified or deleted
- The ability to add a description or change the owner of a document
- Links to document locations

We use InEight Project Suite and our Environmental Matrix to communicate information related to progress, completion, and compliance to the Department. These tools are described below.



## 9.1 INEIGHT PROJECT SUITE

KMP uses InEight Project Suite to generate weekly, monthly, and quarterly environmental compliance and permit status reports. These are reviewed and approved each week, month, or quarter by the EM. Project issues related to permit conditions, required compliance criteria, and any environmental incidents are reported to the EM immediately and resolved with the Discipline Superintendent and the Construction Manager. Specific environmental activities that fall outside Approved limits are reported and resolved according to the applicable environmental plan, or the QMP, and reported to the EM. In these events, the Department and regulatory agencies are contacted by the EM as specified in the permit conditions. Using this process, the EM and the Environmental Team are able to confirm environmental compliance, and communicate such to the regulatory agencies and the public.

## 9.2 ENVIRONMENTAL MATRIX

KMP's Environmental Management Team prepares an Environmental Matrix in InEight Project Suite to monitor, track, and manage compliance with Environmental Requirements and commitments. This matrix includes fields for commitment description, environmental analysis category, responsible parties, and applicable compliance dates (for example, due date, authorization date, expiration date).

The Environmental Matrix is used to record, track, and report on commitments and their status. Types of reports that can be prepared from the data in the Environmental Matrix include commitments associated with a particular permit, agency, or environmental analysis area; and summaries of the Project-wide status of commitments.

The EM compiles and disseminates Environmental Requirements of the Project Agreement, environmental documentation requirements, and permit terms and conditions so the Project Team can incorporate these requirements into the Design and Construction activities.

In addition to the commitments database, the following tools and strategies are used to achieve compliance:

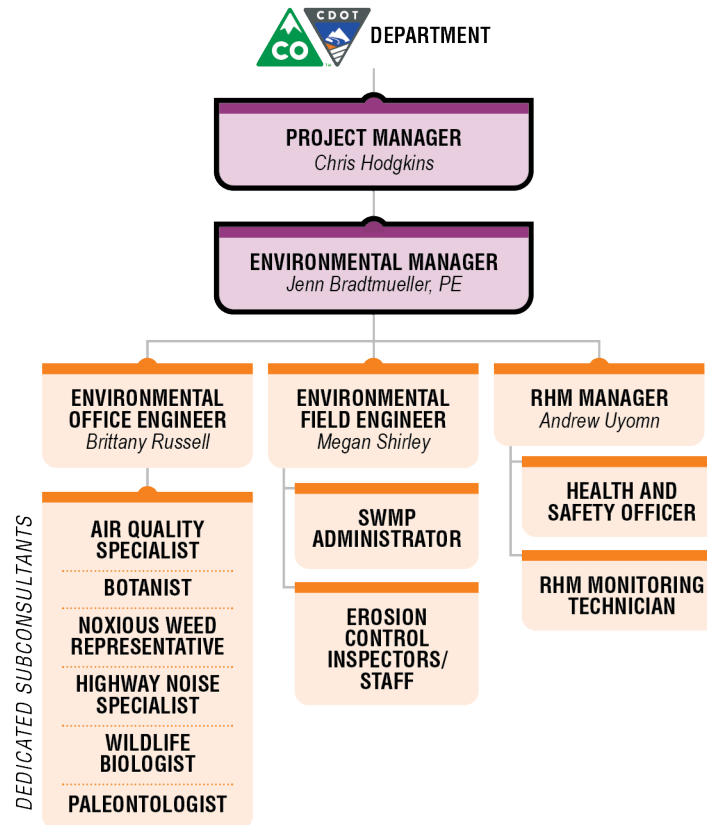
- Partnering with the Department and regulatory agencies to ensure that environmental compliance requirements and activities are clearly communicated
- Preparing and implementing environmental plans, as specified in Schedule 17
- Participating in task forces and Project meetings to discuss Work status, upcoming activities, and compliance issues
- Participating in periodic external meetings with the regulatory agencies, as required
- Participating in over the shoulder and formal reviews of Design documents to ensure incorporation of Environmental Requirements

## 10. Environmental Management Team

KMP provides environmental oversight for all Project activities. The organization chart below identifies environmental personnel and resources dedicated to this Project, including personnel responsible for implementing the landscape, irrigation, and noxious weed control program, and water quality compliance activities. The responsibilities of the Environmental Manager and the Environmental Team are purposely independent of the production staff to ensure the proper checks and balances are in place to meet the Project environmental goals and compliance requirements for the Construction Period.

## Organization of Environmental Management Team

Key Personnel
  Developer
  Commercial
  Construction



The KMP Environmental Management Team also includes personnel in the roles described below in this section. Individuals performing the Work are qualified environmental professionals, and have the appropriate educational credentials and a minimum of 2 years' professional experience in the specific discipline, unless higher standards are specified. KMP submits the qualifications of environmental professionals performing the Work to the Department as part of the ESR and Mitigation Completion Reports, in accordance with Schedule 17, Section 5.2.1.

### 10.1 ENVIRONMENTAL MANAGER

Jenn Bradtmueller, our Environmental Manager, reports to the Project Manager and is the primary liaison between KMP and the Department on environmental issues. She is the lead responder to any noncompliance findings for Environmental Requirements issued by the Department or the Independent Quality Control Manager, ensures compliance with all Environmental Requirements and commitments, and has authority to suspend Work. In addition, our EM, or designee where appropriate, has the following duties:

- Provide support to the Independent Quality Control Manager to ensure that compliance with Environmental Requirements is included in inspections
- Conduct a weekly field review of the entire Project, and include a summary of the field reviews in the ESR
- Coordinate the implementation of procedures to meet all Environmental Requirements
- Ensure full compliance with Environmental Requirements in the Work



- Ensure that environmental tasks are performed by qualified environmental professionals, and provide the resources to perform the Work needed to meet the Environmental Requirements
- Lead environmental cross-disciplinary reviews of Design submittals to confirm compliance with Environmental Requirements and Project environmental commitments
- Perform reviews of proposed Developer Changes, prior to submittal to the Department, for any related Developer Change Notice pursuant to Schedule 24 (Change Procedure), to ensure the Change complies with the Environmental Requirements
- Perform reviews with respect to any Enterprise Change, as required by the terms of an Enterprise Change Notice
- Measure the number and severity of nonconformances with the Environmental Requirements, and include a summary of the findings in the ESR
- Implement improvement strategies to reduce the number and severity of nonconformances with the Environmental Requirements, and include a summary of the findings in the ESR
- Monitor Work for conformance with Environmental Requirements, and include a summary of the findings in the ESR
- Plan and implement the ECMTMP
- Lead a field review with the Department to review the Project and environmental issues each month
- Lead Environmental Task Force Meetings on a weekly basis during the Construction Period, and coordinate the participation of appropriate KMP members
- Attend public and stakeholder meetings related to the Project and participate, as needed
- Provide Mitigation Completion Reports documenting and certifying the completion of Environmental Requirements

## 10.2 ENVIRONMENTAL OFFICE ENGINEER

KMP's Environmental Office Engineer, Brittany Russell, or designee where appropriate, has the following duties:

- Develop and implement the Project's ECWP
- Maintain and update environmental documents pertaining to the Project
- Conduct environmental training with Project staff
- Perform periodic Project status reviews
- Attend regularly scheduled operations meetings

## 10.3 ENVIRONMENTAL FIELD ENGINEER

KMP's Erosion Control Engineer, Megan Shirley, or designee where appropriate, has the following duties:

- Oversee field activities and ensure all activities comply with environmental laws and regulations
- Implement Project's ECWP in the field
- Perform environmental monitoring
- Oversee environmental subcontractors in the field
- Coordinate any corrective actions with crews
- Conduct environmental training with field crews

## 10.4 RECOGNIZED HAZARDOUS MATERIALS (RHM) MANAGER

Our RHM Manager, Andrew Uyomn, or designee where appropriate, has the following duties:

- Implement the Materials Management Plan (MMP)
- Ensure KMP follows all Environmental Requirements applicable to RHM
- Lead bi-weekly (every two weeks) meetings with the Department to review the status of RHMs
- Notify the Department in writing within eight hours of encountering/discovery of Hazardous Substances (including releases thereof) affecting the Site or the Work

Andrew has 13 years of experience managing RHMs.

## 10.5 STORMWATER MANAGEMENT PLAN (SWMP) ADMINISTRATOR

The Stormwater Management Plan (SWMP) Administrator, or designee where appropriate, has the following duties:

- Conduct inspections.
- Provide oversight of subcontractors.
- Conduct day-to-day environmental compliance activities.
- Complete the SWMP Notebook as described in subsection 208.03 (d).
- Participate in the Environmental Pre-Construction Conference.
- Attend Weekly Water Quality Meetings (WWQM).
- Attend all Department water quality control inspections.
- Coordinate with the Superintendent to implement necessary actions to reduce anticipated or presently existing water quality or erosion problems resulting from Construction activities.
- Coordinate with the Superintendent to ensure that all labor, material, and equipment needed to install, maintain, and remove BMPs are available as needed.
- During Construction, update and record the following items on the SWMP site map as changes occur:
  - Limits of Construction (LOC).
  - Areas of Disturbance (AD).
  - Limits of Disturbed Areas (LDA).
  - Limits of cut and fill.
  - Areas used for storage of construction materials, equipment, soils, or wastes including concrete wash-out pits.
  - Location of any dedicated asphalt or concrete batch plants.
  - Location of Construction offices and staging areas.
  - Location of Work access routes during Construction.
  - Location of borrow and waste.
  - Location of temporary, interim, and permanent stabilization.





- Location of outfall(s).
- Arrows showing direction of surface flow.
- Structural and non-structural BMPs.
- LDA and LOC lines as defined in subsection 107.25.
- Amend the SWMP whenever there are: additions, deletions, or changes to BMPs. SWMP revisions shall be recorded immediately. Items shall be dated and initialed by the SWMP Administrator. Specifically, amendments shall be made in the following situations:
  - A change in Design, Construction, Operation, or Maintenance of the Site that would require the implementation of new or revised BMPs
  - Changes when the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with Construction activity.
  - Changes when BMPs are no longer necessary and are removed.
- Complete vegetative survey transects as required in accordance with CDOT Erosion Control and Stormwater Quality Guide.
- All original and updated site maps shall remain in the SWMP Notebook.
- Document all inspection and maintenance activities. The SWMP and documentation shall be maintained electronically.
- When adding or revising BMPs on the SWMP, add a narrative explaining what, when, where, why, and how the BMP is being used, and add the following details to the SWMP Notebook:
  - How to install and inspect the BMP
  - Where to install the BMP
  - When to maintain the BMP
- If using existing topography, vegetation, etc. as a BMP, label it as such on the SWMP site map; add a narrative as to when, where, why, and how the BMP is being used.
- Indicate BMPs in use, or not in use, by recording on Standard Plans M-208-1, M-216-1, and M-615-1 in the SWMP Notebook.
- Record the Approved Method Statement for Containing Pollutant Byproducts on the SWMP.
- Update the potential pollutants list in the SWMP Notebook and Spill Response Plan throughout Construction.

The SWMP Administrator has completed the Transportation Erosion Control Supervisory Certificate Training (TECS).

## 10.6 EROSION CONTROL INSPECTOR ENGINEER

The Erosion Control Inspector Engineer, or designee where appropriate, has the following duties:

- Conduct inspections
- Provide oversight of subcontractors
- Conduct day-to-day environmental compliance activities
- Coordinate with the SWMP Administrator on reporting the results of inspections
- Review the Construction Site for compliance with the Stormwater Construction Permit
- Inspect with the Superintendent and the Independent Quality Control Manager (or their designated representatives) the stormwater management system
- Follow all other agency stormwater requirements and inspections, unless a waiver or other agreement has been made
- Immediately report noncompliance to the contractor's superintendent and the SWMP administrator
- Document spills, leaks, or overflows that result in the discharge of pollutants on the Form 1176; record the time and date, weather conditions, reasons for spill, and how it was remediated

The Erosion Control Inspector Engineer has completed the TECS certifications training.

## 10.7 HIGHWAY NOISE SPECIALIST

The Highway Noise Specialist, or designee where appropriate, has the following duties:

- Implement a Construction Noise Mitigation and Monitoring Plan (CNMMP)
- Monitor Work for compliance

The Highway Noise Specialist has 2 years of experience and expertise in the field of highway noise analysis in Colorado.

## 10.8 NOXIOUS WEED QUALIFIED REPRESENTATIVE

The Noxious Weed Qualified Representative, or designee where appropriate, has the following duties:

- Implement the Integrated Noxious Weed Management Plan (INWMP)
- Prepare a recurring Noxious Weed Survey (monthly from March through October during the Construction Period, and three times per year spread evenly over the growing season during the Operating Period).
- Prepare a monthly Schedule of Planned Noxious Weed Management Activities based on findings of the latest Noxious Weed Survey
- Provide weed identification, mapping, scheduling herbicide application, and noxious weed herbicide selection
- Develop criteria for topsoil salvage

The Noxious Weed Qualified Representative has 2 years of experience with Noxious Weed Surveying and Treatment.



## 10.9 QUALIFIED WILDLIFE BIOLOGIST

The Qualified Wildlife Biologist, or designee where appropriate, has the following duties:

- Conduct surveys of the location of each protected nest, bird species, the protection method used, and the date installed to ensure compliance with all aspects of the Migratory Bird Treaty Act (MBTA).
- Provide recommendations to the Construction Team related to buffer zone dimensions when active migratory bird nests are present.
- Conduct surveys of ground nesting bird habitat within 7 Calendar Days immediately prior to ground-disturbing activities if Work occurs between April 1 and August 31.
- Conduct dusk and dawn surveys of Bald Eagle roosts within 7 Calendar Days prior to the start of any Construction during the winter season, November 15 to March 15.
- Conduct raptor nest surveys within 0.5 mile of the Site prior to the start of Construction, and prior to each Construction phase. In consultation with CPW, recommend “NO WORK” zones around active sites during Construction, marking the area with fencing or signing. Determine that the young have fledged, or the nest is unoccupied before allowing Work to proceed.
- Ensure compliance with CDOT’s Impacted Black-tailed Prairie Dog Policy, regulating policies from Local Agencies, and all applicable Law and Environmental Requirements associated with BTPD.
- If BTPDs are relocated or removed during the burrowing owl nesting season (March 15 to October 31), surveys the affected habitat for the presence of burrowing owls no more than 7 Calendar Days prior to initiating relevant Construction activities.
- Ensure compliance with CPW protocols regarding State-threatened burrowing owls in association with BTPD colonies located throughout the Site. Notify the Department if nesting pairs are identified, and ensure Construction Work does not occur within 150 feet of an active nest during burrowing owl nesting season (March 15 to October 31). Establish a seasonal buffer zone if a nest becomes occupied after the start of Construction activities in any part of the Site.

The Qualified Wildlife Biologist has a minimum of 3 years of experience conducting migratory bird surveys and implementing the requirements of the MBTA.

## 10.10 QUALIFIED BOTANIST

The Qualified Botanist, or designee where appropriate, has the following duties:

- Conduct surveys for the Colorado Butterfly Plant (*Gaura neomexicana*) during the flowering season within and adjacent to the Areas of Disturbance (AD) at the South Platte River and Sand Creek prior to starting Construction activities in these areas.
  - Re-survey each flowering season if these areas remain undisturbed between the initial survey and subsequent flowering seasons.
- Notify the EM immediately if Colorado butterfly plants are found.
- Obtain all required Environmental Approval(s), as required, prior to impacting the Colorado butterfly plant.
- Conduct surveys for the federally threatened Ute ladies’-tresses orchid (*Spianthes diluvialis*) during the flowering season within and adjacent to the AD at the South Platte River and Sand Creek prior to starting Construction activities in these areas.
  - Re-survey each flowering season if these areas remain undisturbed between the initial survey and subsequent flowering seasons.
- Notify the EM immediately if Ute ladies’-tresses orchid are found.

- Obtain all required Environmental Approval(s), as required pursuant to the Project Agreement, prior to impacting the Ute ladies'-tresses orchid.

The Qualified Botanist has 2 years of experience as a botanist.

## 10.11 PALEONTOLOGIST

The Paleontologist, or designee where appropriate, has the following duties:

- Provide continuous paleontological monitoring during the Construction Period when bedrock of the Denver and Arapahoe Formations is exposed.
- Spot check the Site weekly during the Construction Period when the Denver and Arapahoe Formations are not exposed
- Communicate with the Department to provide 7 Calendar Days' notification to the Department's paleontologist when Work in the Denver and Arapahoe Formations is scheduled.
- Provide all reports required by the terms of permits to the appropriate Governmental Authority, and submit copies to the Department.
- Provide monthly summary of activity on the Site to be included in the ESR.
- Provide Paleontological Annual Reports to the Department for Acceptance, detailing Work completed and fossils collected and curated.
- Provide a Project Paleontological Summary Report to the Department for Acceptance when all earthwork is complete.
- Communicate directly with the Department's Paleontologist during the Construction Period and allow ongoing over the shoulder review of all field activities. Notify the Department immediately in the event of discovery.
- Cease Work in the vicinity of a discovery and fence off the area upon discovery of paleontological resources.
- Conduct sampling or excavation of specimens by hand or with mechanized equipment.
- Curate materials following guidance in 8 CCR 1504-7 Historical, Prehistorical, and Archaeological Rules and Procedures.
- Issue formal notification when Construction Work is allowed to resume.

The Paleontologist is permitted through the Office of the State Archaeologist.

## 10.12 HEALTH AND SAFETY OFFICER

The Health and Safety Officer has thorough knowledge of all applicable OSHA, Environmental Protection Agency (EPA), state, and local regulations as they pertain to the protection of the environment, and the safety and health of workers and public. The Health and Safety Officer, or designee where appropriate, has the following duties:

- Prepare and implement a Health and Safety Plan (HASP) in compliance with 29 CFR 1910 and 1926, and 29 CFR 1926.65, paragraph (b)(4) for Department Approval, and distribute the HASP to all employees that could be potentially exposed to Recognized Hazardous Materials (RHM).
- Develop and maintain Onsite all industrial hygiene information, including "right-to-know" information.
- Act as the Health and Safety Officer in compliance with subsection 250.03(a) of the CDOT Standard Specifications.



The Health and Safety Officer is a Certified Industrial Hygienist with at least 10 years of experience working on and developing health and safety programs for projects that require the handling, treatment, storage, and disposal of RHMs. The Health and Safety Officer has completed OSHA training in accordance with 29 CFR 1910.120(e), including 40-hour (1910.120(e)(3)(i)), and management and supervisor training (1910.120(e)(4)); minimum training and medical surveillance requirements established by OSHA and the EPA for a supervisory Site Safety Official per 29 CFR 1962.65; and training and certification in accordance with the Air Quality Control Commission Regulation No. 8 Part B (State- and EPA-Certified Asbestos Building Inspector [CABI]).

### 10.13 AIR QUALITY SPECIALIST

The Air Quality Specialist, or designee where appropriate, has the following duties:

- Implement the Air Quality Monitoring, Maintenance, and Mitigation Plan (AQ3MP)
- Perform and document daily visual inspection of active Work Sites within the Construction Site boundary, with the goal of preventing Offsite transport of fugitive particulate emissions
- Perform and document daily opacity readings from all stationary sources operated on the Site that are subject to opacity limits in Section II.A of Air Quality Control Commission Regulation No. 1 (5 CCR 1001-3), and any applicable Permit conditions
- Conduct continuous PM-10 monitoring during the Construction Period in accordance with 40 CFR Part 58 (Ambient Air Quality Surveillance), adequate to characterize PM-10 concentrations along the active Construction corridor
- Continuously monitor meteorological conditions, including Site wind speed and wind gusts, wind azimuths, barometric pressure, relative humidity, and temperature, to assist in making decisions regarding mitigation of fugitive particulate emissions
- Monitor air quality at Swansea Elementary School by monitoring nitrogen dioxide (NO<sub>2</sub>), PM-10, PM-2.5, and additional pollutants that may be added, providing results approximately one week after data collection
- Implement an automated PM-10 alert system that communicates via both text messaging and email when a PM-10 monitored level reaches a running eight hour average concentration of 135 µg/m<sup>3</sup>
- Collect and submit PM-10 and meteorological data to the Department in an electronic format for posting on the Project website
- Provide a list of air quality BMPs that KMP uses for Construction Work, and a description of how each is implemented
- Maintain a daily log of air quality observations and mitigation measures during all phases of Construction Work, with a report and log of data collected submitted to the Department monthly in the ESR

The Air Quality Specialist is certified according to state and federal standards, with certification status maintained throughout the duration of the Construction Work.

## 10.14 LANDSCAPE AND IRRIGATION MANAGER (SEEDING, FERTILIZER, SOIL CONDITIONER, AND SODDING)

The Landscape and Irrigation Manager, or designee where appropriate, has the following duties:

- Ensure compliance with the following CDOT Standard Specifications:
  - Section 212, Seeding, Fertilizer, Soil Conditioner, and Sodding
  - Section 213, Mulching
  - Section 214, Planting
  - Section 215, Transplanting
  - Section 216, Soil Retention Covering
  - Section 217, Herbicide Treatment
  - Section 623, Irrigation Systems
- Serve as Erosion Control Supervisor (ECS)
- Implement water quality compliance activities
- Provide SWMP administration and erosion control inspection, in accordance with functions identified in Section 208 of CDOT Standard Special Provisions (April 30, 2015)

The Landscape and Irrigation Manager has working knowledge and experience in Construction, and has successfully completed TECS certification training as provided by the Department. The Landscape and Irrigation Manager cannot serve as Superintendent on the Project.

## 10.15 MONITORING TECHNICIANS

The monitoring technicians are on site during all activities that have the potential to encounter RHMs. In locations where RHMs are not anticipated to be encountered, the monitoring technicians are on-call and available to respond to unexpected conditions. The designated monitoring technician can delegate activities to other qualified monitoring technicians. The monitoring technicians have the following duties:

- Identify and monitor hazardous substances during the Term
- Perform requirements of subsection 250.03(b) of the CDOT Standard Specifications

The monitoring technicians have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER), and eight-hour OSHA Supervisory training, and have state and EPA-CABI certification.



## 11. Sustainability

As described in Section 6.2.4 above, KMP has adopted the Idling Policy of Kiewit’s sustainability program. This program was developed and implemented so that the company operates in a more sustainable manner to safeguard the welfare of Kiewit employees, help preserve the environment, and improve the company’s financial performance. Under the Idling Policy, vehicles and equipment are not allowed to idle longer than five minutes, thereby reducing fuel consumption, diesel emissions, and noise, as well as decreasing vehicle and equipment maintenance. KMP works to continually identify other sustainable practices, such as reducing waste and water consumption at offices and projects, to minimize negative impacts to the environment, and to consider the economic growth of the business and the prosperity of all employees and the communities in which they live and work. KMP looks for opportunities to partner with local organizations, such as Habitat for Humanity, to reuse or repurpose demolition materials from the Project. By utilizing InEight Project Suite, KMP reduces the amount of paper used on the Project, working toward the goal of being a paperless Project.

In addition, KMP has other Project Sustainability goals supporting environmental , social, and economic sustainability, listed in the table below.

### KMP Sustainable Goals

Environmental	Social	Economic
<ul style="list-style-type: none"> <li>▪ Reduce air emissions</li> <li>▪ Reduce water pollution</li> <li>▪ Reduce waste generation through source reduction, reuse, and recycling</li> <li>▪ Reduce energy and water consumption</li> <li>▪ Reduce demand for natural resources</li> <li>▪ Recycle and Reuse</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintain a safe and healthy work environment for employees</li> <li>▪ Hire and train local and diverse employees</li> <li>▪ Improve community relations</li> <li>▪ Improve labor relations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduce material and waste expenses</li> <li>▪ Reduce energy and water expenses</li> <li>▪ Reduce transportation costs and fuel expenses</li> <li>▪ Increase cooperative use of and/or access to resources</li> <li>▪ Stimulate innovation</li> </ul>

## 12. Spill Reduction Program

The purpose of the Spill Reduction Program is to eliminate fluid releases into the environment. Our goal is zero spills. However, if a spill does occur, the program outlines the steps and procedures we employ to prevent future spills of a similar nature.

An example of a successful spill reduction program is from a \$1 billion Kiewit earthwork project, including 95 million bank cubic yards of earth moving. There were 150 pieces of heavy equipment on the project. The spill reduction program included:

- Reporting and investigating every spill
- Putting an enhanced focus on daily visuals
- Enhancing accountability for environmental incidents
- Developing a job environmental analysis

The spill reduction program also included implementing a Maintenance Environmental Steward Program, comprising the following aspects: assigning a senior maintenance superintendent to each shift as a steward; placing primary focus on environmental performance and proactive

inspections; working hand-in-hand with the environmental group on spill investigations; and helping develop best practices to ensure that spills would not recur. The project achieved a 90% overall incident reduction over 2 years by implementing the program. This included a 45% incident reduction over the first year, and an 81% incident reduction over the second year of the program.

The Environmental Team includes maintenance personnel, and meets on a regular basis to review spill data and develop actions to prevent future spills. This program has proven to be successful in past Projects. Focusing more time on performing proactive maintenance resulted in reduced machine downtime, and reduced man-hours mitigating spills, while generating less waste.

Two key initiatives were identified as being integral to the success of the program:

- Including maintenance personnel on the Environmental Team and meeting regularly to review spill data. Engaging seasoned individuals brings legitimacy to the program. These individuals serve as mentors to Maintenance and Operations staff, providing training in the recognition of maintenance issues that can lead to spills.
- Enhancing visual inspections and preventative maintenance programs. In addition to daily inspections by operators, conducting regular proactive inspections of equipment and more detailed inspections during Routine Maintenance (See Appendix A).

Overall incident reduction is accomplished through training, education, employee recognition, and encouragement.

## 12.1 SPILL REDUCTION TRAINING

Education is an extremely important aspect of a successful program. All have the desire to do what is right; however, not all are aware of how to do what is right. Education on the spill reduction program is conducted through:

- New hire training
- Annual training on SPCC, SWMP, and other needed topics
- Daily presence in the field
- Discussions and presentations at foreman training
- Best Management Practices

## 12.2 REPORTING

When environmental incidents happen they are investigated, documented, tracked and reported. Incident (spill) analysis is conducted by the Environmental Team to determine the root cause. This ensures that corrective actions are tied to root cause and are effective in preventing incident reoccurrence. Most spill investigations are conducted to follow a “5-Why” process to find the true root cause. 5-Why is an iterative process where, by asking why, the true reasons behind incidents can be discovered.

Data from the environmental incident reporting is rolled up into a monthly reporting format to analyze trends and provide benchmarking to provide a basis for any revisions to plans to prevent future incidents.





DATE: May 25, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 6.1

Dear Mr. John Dionisio:

Your Team's ATC Submission Form for Detailed ATC 6.1 has been reviewed by the Procuring Authorities. As discussed during the April One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 6.1 proposes revising the detention pond standards from Urban Drainage and Flood Control District (UDFCD) to Best Management Practices and a FHWA Performance Based Practical Design to reduce impervious surfaces in the ponds.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. The Department will continue to require the Developer to adhere to the UDFCD Extended Detention Basin procedure for calculating the size and layout for all pond locations.
- 2. The standard sloping outlet structure with concrete micropool, trash rack, orifice plate, and controlled release for the minor and major storm shall be used at all pond locations.
- 3. The Department is not providing approval for the use of soft-bottom trickle channels at all pond locations. Soft-bottom trickle channels will only be considered on a case-by-case basis after the



Developer has provided a detailed design for each pond that proves the following UDFCD recommendations can be achieved. The soft-bottom trickle channel shall:

- a. Be a minimum of 1.5' deep;
  - b. Have a minimum consistent longitudinal slope of 1% and not meander in the bottom of the pond;
  - c. Not contain riprap or soil riprap.
4. The forebay shall remain a hard surface and can be lined with grouted boulders instead of concrete to define sediment removal.
  5. The requirements for pond access shall remain per the PA. The access roads can be compacted ABC a minimum of 6 inches thick with 6 inches, minimum, compacted subgrade.



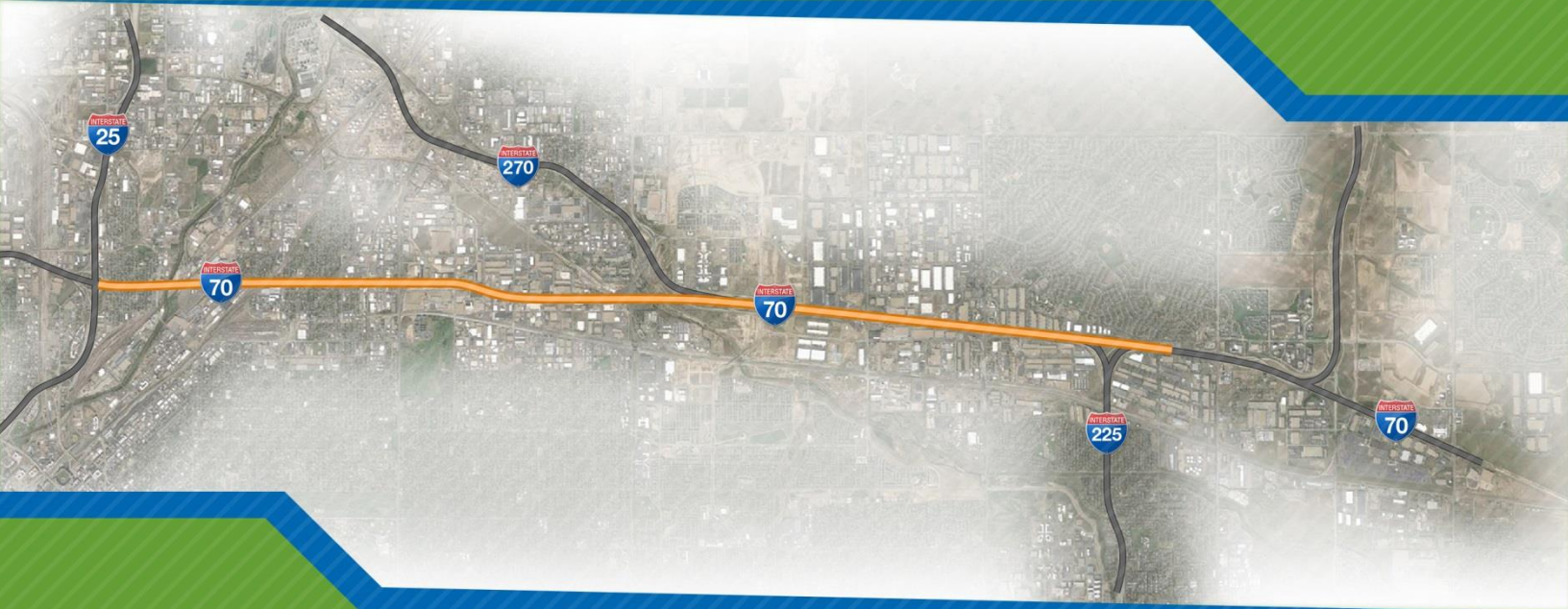




# Central 70 Project

Alternative Technical Concept Submission

ATC 6.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** April 12, 2016

**Central 70 Project RFP: ATC Submission No. 6.1**

**Revise Detention Pond Standards**

### A. Background Information

#### 1. Type of Submission

Conceptual ATC

Detailed ATC

#### 2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

#### 3. Explanation of Reason for Resubmission

Response to initial submittal 6.0 was “unconditional approval for re-submission as a Detailed ATC”

#### 4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

The Preliminary Drainage Plans and criteria for Central 70 as specified in Schedule 10 Section 8 of the Project Agreement have been developed based on the Urban Drainage and Flood Control District (UDFCD) Standards. The UDFCD Standards require that detention ponds include riprap rundowns, forebays, trickle channels, outlet structures, micropools, soil riprap overflows, maintenance access roads, and a significant amount of custom metalwork. These elements are not currently shown on the preliminary plans but will likely be incorporated as detailed design progresses. Based on past experience, Kiewit-Meridiam Partners (KMP) anticipates that the scope of work and associated construction costs will increase as a result of basing the design on UDFCD Standards and CDOT preferences for maintenance access. KMP’s solution reduces initial construction costs and decreases the O&M costs and potential environmental health issues associated with detention ponds.

### ATC 6.1 Benefits

- ✓ Reduces Capital and O&M costs
- ✓ Simplifies maintenance process
- ✓ Provides better performance and reliability
- ✓ Accelerates schedule
- ✓ Provides high quality, more sustainable solution
- ✓ Reduces construction cost by \$1 million
- ✓ Compliant with EIS requirements and provides long term betterment over current approach
- ✓ Performance-Based Practical Design



KMP proposes an alternative concept that would utilize Best Management Practices (BMPs) and a FHWA Performance Based Practical Design (PBPD) approach to reduce the UDFCD standard concrete work and other impervious surfaces such as maintenance access roads at all ponds. BMPs could include vegetation, berms, or check dams to control the flows and manage sediment. The BMPs would satisfy UDFCD's performance criteria while providing more cost effective, natural, sustainable, maintainable, and visually appealing ponds.

## 2. Relevent RFP Requirements

This information ***has been*** amended since the submission of the previous version of this ATC.

Schedule 10 Section 8.4.4.f, Paragraph iii of the Project Agreement states:

*“All ponds shall adhere to the extended detention basis (EDB) design guidance as defined in the UDFCD Urban Storm Drainage Criteria Manual.”*

The UDFCD Urban Storm Drainage Criteria Manual prescribes several concrete features such as a hard-bottom forebay, a micropool with a concrete bottom, and stabilized access to include concrete, articulated concrete block, or concrete grid pavement. KMP is proposing to remove the requirements for these concrete features.

Additionally, KMP is proposing to remove the requirements of the concrete trickle channel with mountable curb prescribed in Schedule 10 Section 8.4.4.f, Paragraph v of the Project Agreement, which states:

*“A six foot minimum width concrete trickle channel with mountable curb to convey nuisance flows from inflow locations to the primary low-level outlet and shall be designed for maintenance equipment loads”*

## 3. Rationale

This information ***has been*** amended since the submission of the previous version of this ATC.

KMP's experience on transportation projects in the Denver area and in other parts of the country has shown that using more environmentally sustainable BMPs for detention pond design is optimal as BMPs meet or exceed the long term performance requirements in a cost effective and sustainable manner.

**Figure 1** shows an example of a large stormwater management facility constructed using BMPs. In the foreground is a riprap inlet channel used to dissipate energy and control the velocity of the incoming stormwater. Water passes through a pretreatment forebay before entering the main basin. In the background, the simple outlet structure contains an orifice pipe to control the outlet flow. Grass swales and flatter slopes within the stormwater facility simplify maintenance and offer additional quality management opportunities.



**Figure 1 – Detention Pond Using BMPs**

**Figure 2** depicts a typical detention basin for a transportation project in Denver following UDFCD standards. Stormwater is channeled through the basin via a series of concrete channels from the concrete forebay structure to the outlet. The added impervious surface offers no opportunity for natural stormwater management opportunities.

In addition to capital construction cost savings, this ATC provides a resolution to common long term maintenance issues. These include:

- **Standing Water:** KMP's recommendation reduces standing water. Standing water can result in an increase in mosquito breeding areas, stagnated water, and long term maintenance issues.
- **Sediment Build-up:** BMPs are easier to clean out. It is not uncommon for sediment and debris to build-up within in the UDFCD Standard ponds which adversely affects their performance.
- **Maintenance Considerations:** As requested in the December 10, 2015 One-on-One Meeting, KMP prepared additional information regarding the maintenance requirements associated the proposed concept.
  - Numerous State DOTs, including Maryland, Virginia, California, and New Jersey, prefer grass-lined channels as opposed to impermeable trickle channels for many reasons, including the simplified maintenance requirements associated with eliminating concrete features.
  - The 2003 California Stormwater BMP Handbook recommends removing accumulated sediment and re-grading approximately every 10 years or when the accumulated sediment volume exceeds 10 percent of the basin volume.
    - Removal of accumulated sediment and re-grading will be required for both the RFP approach and KMP's approach. The major difference is KMP's approach removes the risk of damage to, and subsequent replacement of, concrete features.
    - KMP will design the forebay to adequately hold the sediment volume expected between clean-outs. Additionally, an increase in an extended detention basin's maximum design storm storage volume will be considered to compensate for loss of storage volume from sediment.
  - To further simplify the maintenance requirements, KMP will follow recommendations from Rutgers Cooperative Extension Water Resources Program by providing native vegetation species.
    - Utilizing native vegetation species to the local habitat will accelerate the establishment period and will ensure a low long term maintenance and survivability.
- **Concrete Degradation:** The freeze-thaw cycles of the Colorado region combined with standing water in the ponds often causes the concrete work to heave and crack. KMP's PBPB BMP approach reduces the likelihood that replacement of the outlet structure or other concrete elements will need to occur during the O&M period.

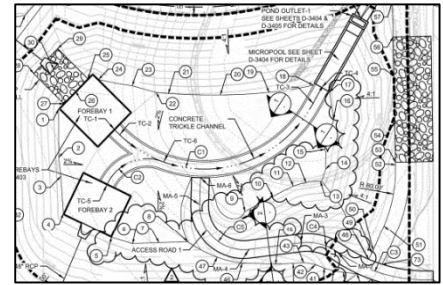


Figure 2 – UDFCD Standard

KMP propose a variance to the UDFCD standards that will reduce the concrete work and maintenance access roads at all ponds. Instead, vegetation, berms, check dams, “soft-bottom” trickle channels, or other BMPs will be utilized to control the flows and manage sediment. This approach has been used effectively on other major transportation projects across the country

including the Inter County Connector in Maryland. Examples of successful PBPD BMPs are shown on **Attachment A**.

This ATC aligns with the Project Goals by improving the overall life cycle costs by reducing the capital construction costs associated with the concrete work at the detention ponds and reducing the long term operations, maintenance, and renewal costs.

## 4. Impacts

This information **has been** amended since the submission of the previous version of this ATC.

The use of BMPs is beneficial since the measures will provide a more natural, sustainable, environmentally friendly solution for stormwater management. As a direct result of the proposed concept, water quality, both during the construction period and long term, to the South Platte River Watershed will be improved by the physical and biological removal of total suspended solids (TSS), sediments, dissolved metals, and other pollutants. Vegetated and soil riprap channels are proven to perform better than concrete trick channels at removing TSS, sediments, dissolved metals, and other pollutants. Additionally, the proposed concept improves life cycle costs by reducing construction and long term maintenance costs.

## 5. Cost and Benefits Analysis

This information **has been** amended since the submission of the previous version of this ATC.

The use of BMPs eliminates a significant amount of work from the Project, which decreases the initial construction costs. Further cost analysis was performed to validate the initial estimate presented in Conceptual ATC 6.0. Based on this analysis, the average savings is projected to be \$80,000 per pond. For 13 ponds, this will result in a savings over \$1 million. For reference, The Havana South Pond construction cost analysis is shown on Table 1.

Havana South Pond RFP Compliant Design						
Item No.	Description	Units	Unit Rate	Quantity	Estimated Cost	Remarks
601	Concrete Class B (Forebays, Micropool, Trickle Channels, Access Roads)	CY	\$450.00	244	\$109,800	CDOT Average Bid Price
<b>RFP Total</b>					<b>\$109,800.00</b>	
Havana South Pond Alternative Technical Concept						
213	Landscape Boulder	EA	\$400.00	60	\$24,000.00	Place Boulders around forebays and micropool
304	Aggregate Base Course (Class 6)	TN	\$25.00	160	\$4,000.00	Maintenance Roads
506	Soil Riprap (9")	CY	\$100.00	20	\$2,000.00	Culvert Outlets
<b>ATC 6.1 Total</b>					<b>\$30,000.00</b>	
<b>RFP Total minus ATC 6.1 Total</b>					<b>\$79,800.00</b>	

In addition to the construction savings, long term maintenance costs are reduced. **Figure 3** shows an actual clean-out of a local pond constructed to UDFCD standards. The effort was extensive and included hauling off excavated sediment, reseeding a significant portion of the pond, and reconstructing the access roads. By using BMPs, the maintenance work is significantly less expensive, since the work only requires excavation and removal of sediment from a simple seeded basin, followed by reseeding.



Figure 3 – Local Pond Cleanout

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC establishes an equal or better performance detention pond and reduces project costs by eliminating an appreciable amount of work from the Project, which would accelerate the construction schedule by freeing up a structural concrete crew to work on critical path tasks. For the 13 ponds required by the Project, KMP estimates a schedule savings of approximately 15,600 man-hours or roughly one year of work for a single crew.

## 7. Conceptual Drawings

This information *has been* amended since the submission of the previous version of this ATC.

In response to the December 10, 2015 One-on-One Meeting, KMP developed two preliminary designs for the Havana South Pond. **Attachment B** shows the preliminary design for the Havana South Pond utilizing a RFP Compliant Design and the Havana South Ponds utilizing the proposed concept.

## 8. Past Use

This information *has been* amended since the submission of the previous version of this ATC.

Suggested alternative pond designs, used by other states, are shown in **Attachment A**. For additional comparison, **Figure 4** is a local example (Belmar Rain Garden) that is comparable to the detention ponds proposed for the Central 70 Project.



Figure 4 – Belmar Park Rain Garden along Wadsworth Blvd (Looking South)

## 9. Additional Information

This information *has been* amended since the submission of the previous version of this ATC.

In the December 10, 2015 Technical One-on-One Meeting, the Procuring Authorities requested additional information including further discussion on the maintenance considerations and preliminary design details. In Section 3 (Rationale) of this ATC, KMP provided the design measures that will be taken to ensure simplified maintenance requirements. The measures include removal of concrete features, design of forebays with adequate capacity to accommodate sediment volume between clean-outs, and utilizing natural vegetation species. Additionally, KMP prepared **Attachment B** to highlight the differences between the RFP Compliant Design and the proposed Alternative Technical Concept.



## C. Detailed ATC Requirements

### 1. Risks

There are no substantial changes anticipated to the overall risk profile of the Project associated with the proposed concept. Furthermore, KMP plans to mitigate any short term and long term risks through proven engineering and construction practices.

Any potential short term risks in the establishment period, approximately one year after construction, will be mitigated through temporary construction BMPs. Temporary construction BMPs will be implemented and routinely maintained to eliminate any potential erosion while vegetation and other landscaping within the forebays, micropools, and trickle channels is being established.

KMP is confident that long term risks will be minimized by producing a quality design that meets UDFCD's performance criteria, while eliminating concrete features, and incorporates the best practices from successful past projects from throughout the country. The use of vegetative BMPs satisfies the UDFCD's performance criteria while providing a more cost effective, natural and sustainable, maintainable and visually appealing solutions for stormwater management. Additionally, vegetative BMPs have successfully been used in the Denver Metro Area and by various DOTs throughout the Country for many years.

### 2. Handback

Changes to handback requirements will not be required. The majority of the pond area will consist of earthwork slopes, which will have a residual life and handback of 30 years. At handback, the Department will receive ponds which meet the earthwork slope requirements and that will require no concrete replacement over the life of the ponds. Additionally, the ponds will improve water quality through the removal of pollutants and aide the Department in complying with 303(d) and TMDL requirements for the South Platte River.

### 3. Right-of-Way

There is no additional right-of-way required for the implementation of the proposed concept.

### 4. List of Required Approvals

Although the Project Agreement notes that ponds shall adhere to UDFCD design guidance, it does not require the Project to be approved for UDFCD maintenance eligibility. Therefore, approval of the design by UDFCD will not be required.

### 5. Proposed Drafting Revisions

a) RFP Requirements that are Inconsistent with Proposed ATC

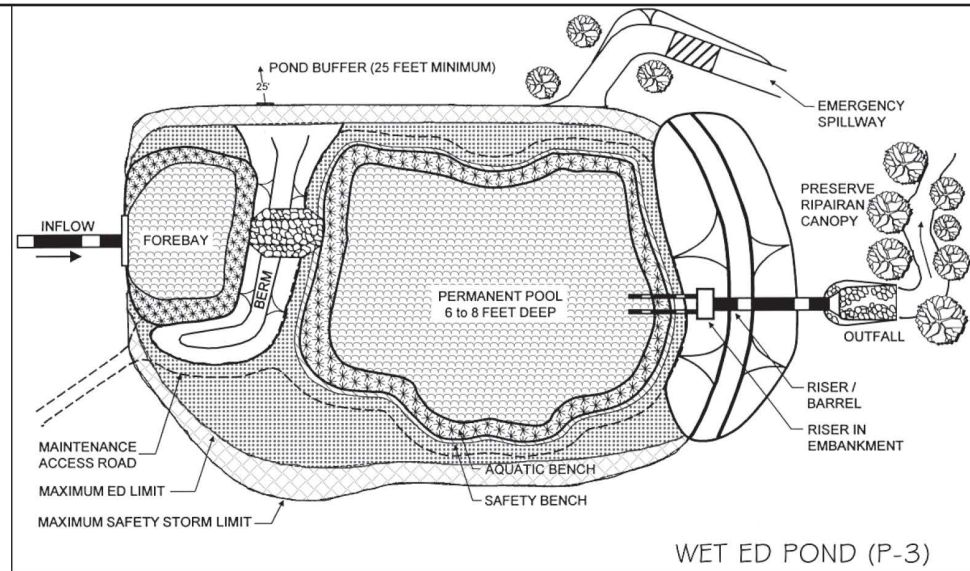
Please reference **Attachment C**.

b) Proposed Revisions to address Inconsistencies

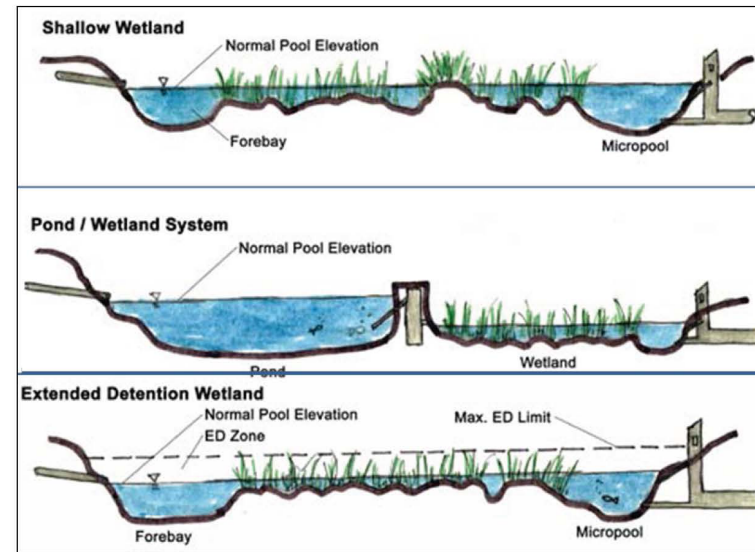
KMP has included the following files with tracked changes for the changes in the sections listed above.

Please reference **Attachment C**.

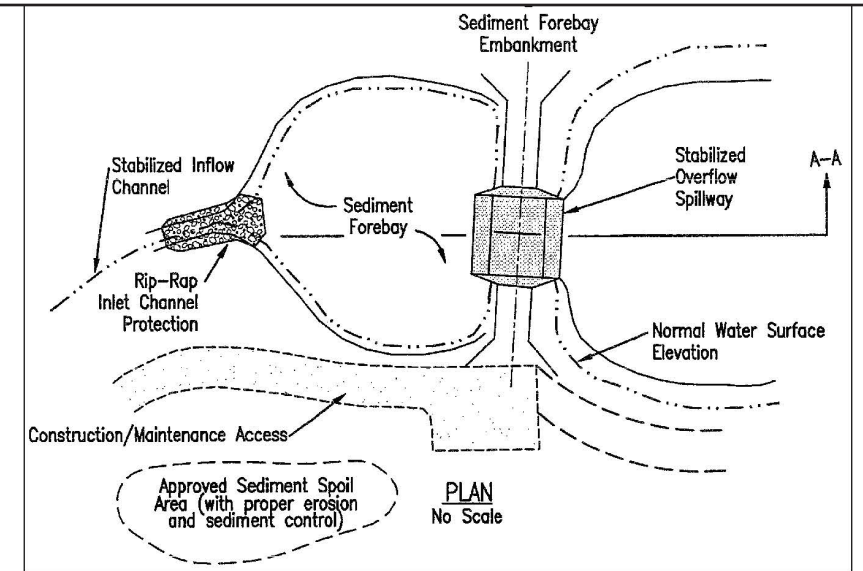




Pond Detail from Maryland utilizing BMPs



Pond detail from Minnesota utilizing BMPs



Pond Detail from Virginia utilizing BMPs



Photo of Pond in Maryland



Photo of Pond in Maryland



Photo of Pond in Maryland



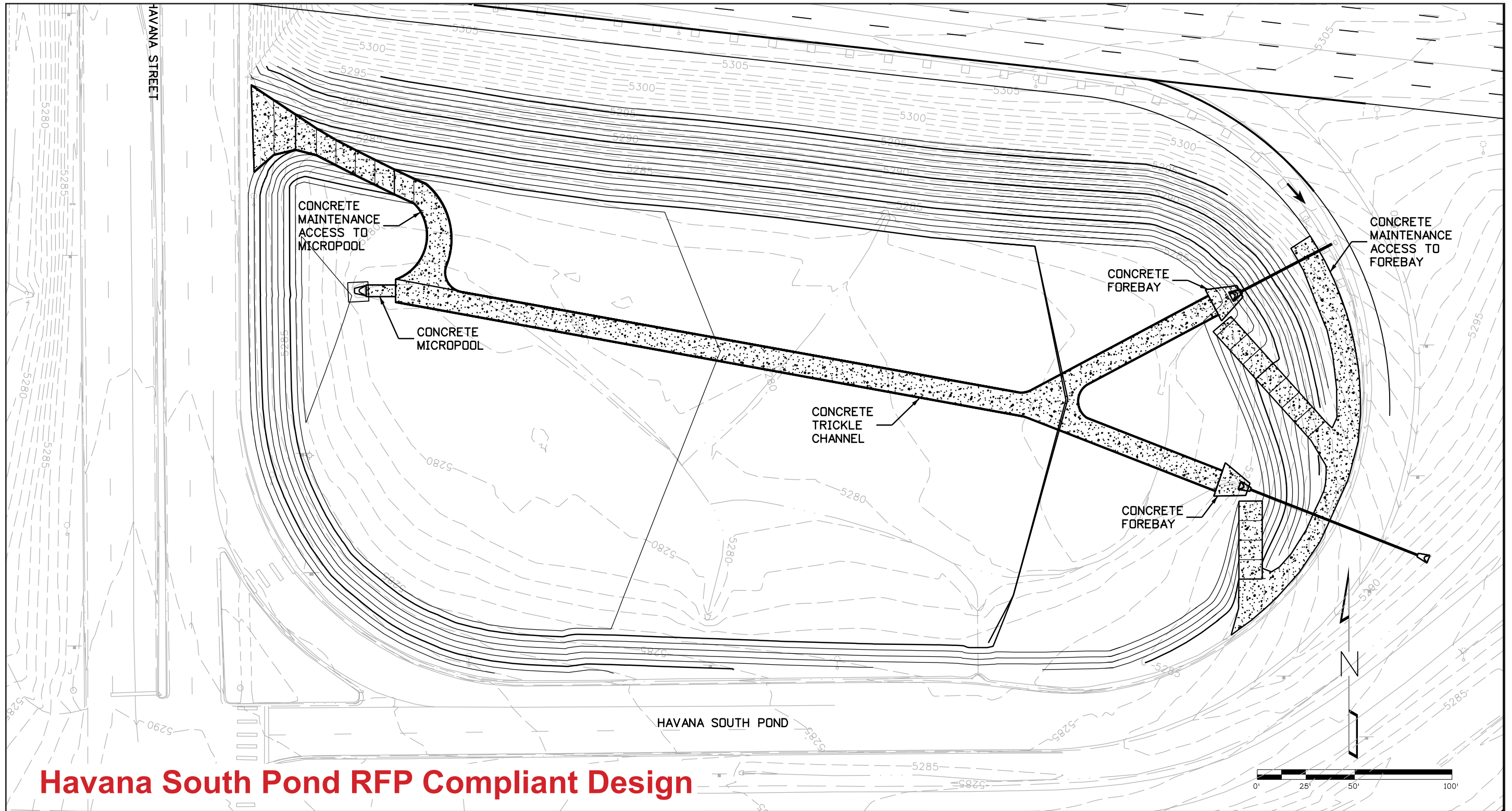
REFERENCE	SECTION	PAGE
B.3	RATIONALE	4
B.8	PAST USE	5

ALTERNATIVE TECHNICAL CONCEPT  
**REVISE DETENTION POND STANDARDS**  
 ATTACHMENT A

ATC NUMBER  
**6.1**

SHEET NUMBER 1 OF 1





# Havana South Pond RFP Compliant Design

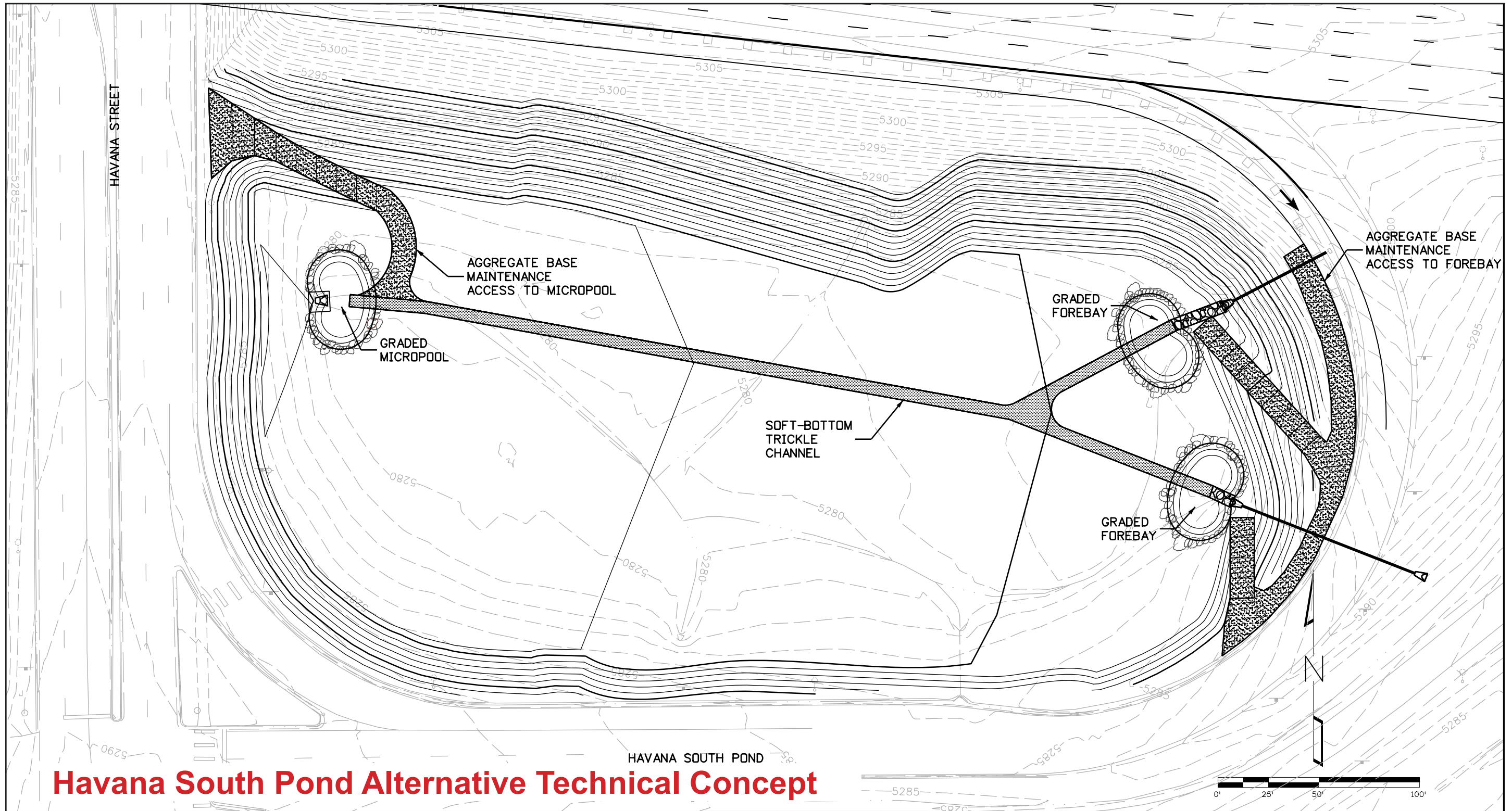


REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	5
B.9	ADDITIONAL INFORMATION	6

ALTERNATIVE TECHNICAL CONCEPT  
**REVISE DETENTION POND STANDARDS**  
 ATTACHMENT B

ATC NUMBER  
**6.1**

SHEET NUMBER 1 OF 2



# Havana South Pond Alternative Technical Concept

HAVANA SOUTH POND



REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	5
B.9	ADDITIONAL INFORMATION	6

ALTERNATIVE TECHNICAL CONCEPT  
**REVISE DETENTION POND STANDARDS**  
 ATTACHMENT B

ATC NUMBER  
**6.1**  
 SHEET NUMBER 2 OF 2

**8.4.4. Hydraulic Structures**

**f. Ponds**

- i. The Developer shall design, construct and locate all ponds to the Ultimate design;
- ii. The Developer shall coordinate with the applicable owner the design and construction of access roads to ponds;
- iii. ~~All ponds will use shall adhere to~~ the extended detention basins (EDB) design guidance as defined in the UDFCD Urban Storm Drainage Criteria Manual; however, revisions to this guidance would include: recommendations for hard-bottom forebays, trickle channels, micropools and other other pond features.
- iv. The Developer shall adhere to the requirements of Section 37-92-602(8) of the Colorado Revised Statutes for ponds and infiltration facilities. The Developer shall submit to the Department all information required for the statewide notification compliance portal for Acceptance;
- v. All ponds shall include the following:
  - A. A six foot minimum width ~~concrete~~ trickle channel ~~with mountable curb~~ to convey nuisance flows from inflow locations to the primary low-level outlet ~~and shall be designed for maintenance equipment loads;~~
  - B. Pre-sedimentation forebay and micro pool;
  - C. Outlet structure shall be flush with the side slope with trash rack;
  - D. Grades within the basin shall not be less than 0.5 percent unless otherwise Accepted by the Department;
  - E. Outfalls flowing into a pond shall be placed no less than 6 inches above the bottom of pond; and
  - F. Emergency spillway.;



REFERENCE	SECTION	PAGE
C.5	PROPOSED DRAFTING REVISIONS	6

ALTERNATIVE TECHNICAL CONCEPT  
**REVISE DETENTION POND STANDARDS**  
ATTACHMENT C

ATC NUMBER  
**6.1**

SHEET NUMBER 1 OF 1





DATE: August 4, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 8.1

Dear Mr. John Dionisio:

Your Team's ATC Submission Form for Detailed ATC 8.1 has been reviewed by the Procuring Authorities.

Detailed ATC 8.1 requests a modification of the roadway embankments material requirements to include onsite native soils with appropriate moisture/density control within the ultimate configuration pavement prism, even though this material may have a resistance value (R-value) of less than 20.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. The proposed modification can only be used on the I-70 Mainline. The modification shall not be used on CDOT Roadways or Local Agency Roadways.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

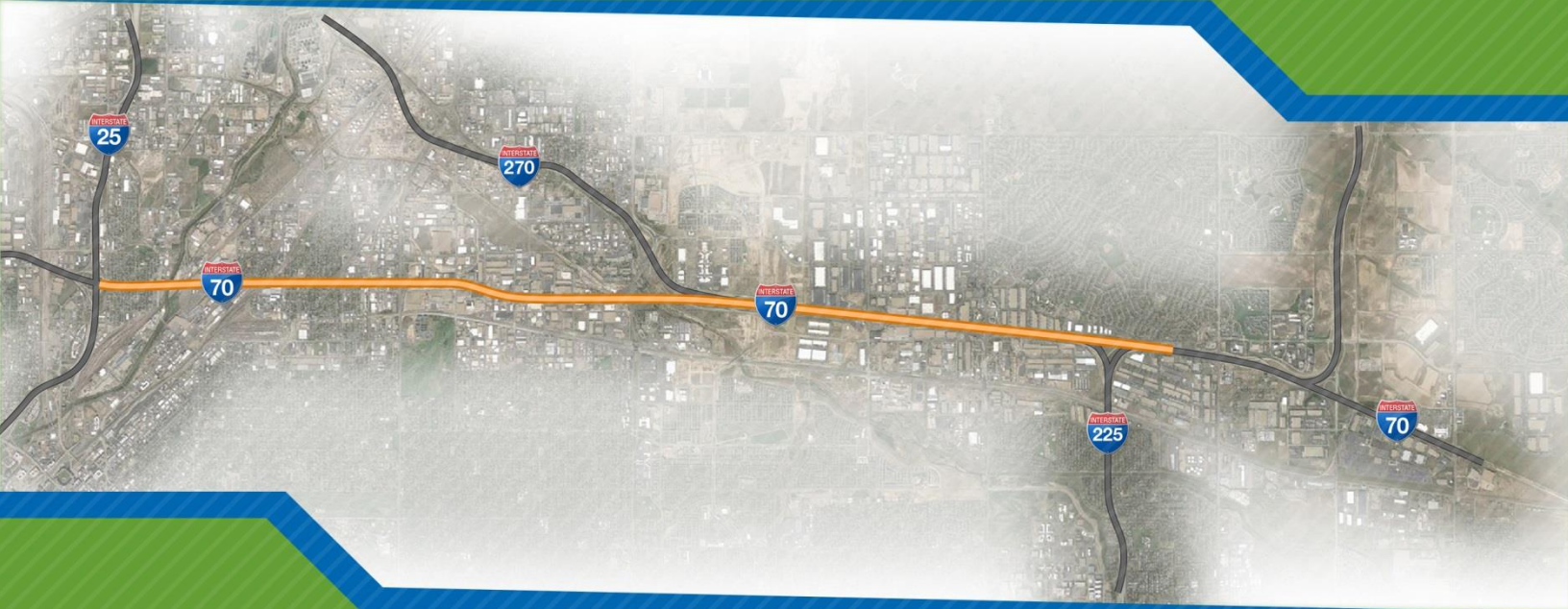




# Central 70 Project

Alternative Technical Concept Submission

ATC 8.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 8.1**

**Modify Roadway Embankment Material Requirements**

### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission
  - To address conditional approval requirements by the procuring authorities
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information ***has been*** amended since the submission of the previous version of this ATC to incorporate the request that the Project Agreement Embankment Fill Requirements remain unchanged for the top three feet of embankment material below the Aggregate Base Course.

Kiewit-Meridiam Partners (KMP) has prepared this ATC to request a modification of the roadway embankments material requirements to include onsite native soils with appropriate moisture/density control within the ultimate configuration pavement prism, even though this material may have a resistance value (R-value) of less than 20. This ATC will apply to the top three feet of embankment material below the aggregate base course. The remaining portions of the embankment within the ultimate configuration pavement prism will be constructed with appropriate moisture/density control without adherence to the R-value requirement (R20) and without R-value testing.

### ATC 8.1 Benefits

- ✓ Reduces Embankment Material Approval Requirements
- ✓ Improves Construction Staging of Earthwork
- ✓ Improves Earthwork Balance
- ✓ Reduces Potential for Construction Disputes and Rework
- ✓ Shorter schedule duration
- ✓ Optimizes Re-Use of On-site Material

## 2. Relevent RFP Requirements

This information has been amended since the submission of the previous version of this ATC to include the relevant RFP Requirements.

Schedule 10, Section 7.3.3 of the Draft 3 Project Agreement states:

“The R-Value of materials acquired from on-Site excavations and subsequently used in embankments on the Project shall have a minimum R-Value of 20 when placed within the Ultimate configuration roadway prism. All compaction shall be in accordance with Section 203 of the CDOT Standard Specifications. “

## 3. Rationale

This information has been amended since the submission of the previous version of this ATC to include Project benefits.

KMP proposes this modification to the embankment fill material requirements to utilize compliant native onsite soils under all roadway embankments. KMP will not include excavated bedrock in the roadway prism due to the potential poor quality and swell characteristics of this material. The majority of the excavation throughout the Lowered Section is anticipated to be granular soil.

The CDOT Standard Specification for Road and Bridge Construction, Section 203 ensures adequate control of embankment materials, placement, moisture content and compaction, without requiring R-value testing for acceptance. Implementation of this ATC will provide adequate embankment stability and post-construction pavement support.

Figure 1 shows the trend between R-value and coefficient of variation. For R20 material, the coefficient of variation from multiple accredited soil laboratories is approximately 50 percent. Using a construction acceptance test that produces a large variation between accredited laboratories for the same material increases risks associated with non-compliance, delays for resolving non-compliance, and costs associated with potential rework.

This ATC directly aligns with the following Project Goals:

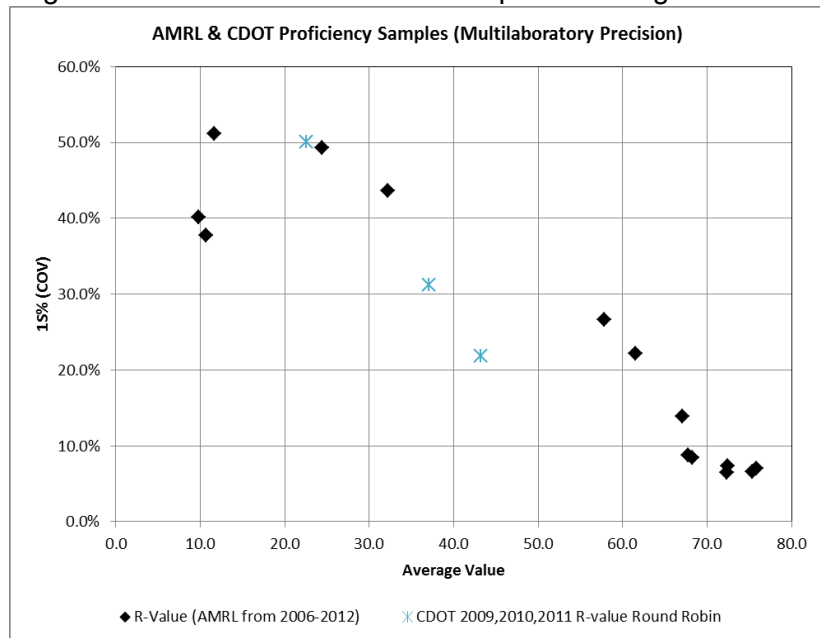


Figure 1. Plot of Coefficient of Variation (percent) with Average R-Value for AASHTO Material Reference (AMRL) Samples and CDOT Round Robin Samples.



- **Optimization of Scope:** This ATC will allow for greater flexibility in the reuse of onsite material, which will optimize the scope through a reduction in trucking and material handling.
- **Minimize impacts:** By reusing a greater percentage of onsite material, localized construction durations will be reduced. This will minimize impacts to the public typically associated with construction activities including noise, impact period, and road closures.
- **Ensures reliable travel speeds:** Minimizing the amount of trucks on the road to haul material offsite will help ensure reliable travel speeds throughout the construction period.

## 4. Impacts

This information ***has been*** amended since the submission of the previous version of this ATC to positive impacts to the Project.

This ATC presents no potential adverse environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts. This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** By allowing KMP to optimize the amount of material reused onsite, this ATC will directly increase Project sustainability through reuse of onsite material and a reduction in hauling requirements.
- **Neighborhood impacts:** This ATC will decrease neighborhood impacts by decreasing localized construction durations.

## 5. Cost and Benefits Analysis

This information ***has been*** amended since the submission of the previous version of this ATC to provide an updated Project savings.

KMP anticipates that this ATC will decrease Project costs through reductions in hauling requirements and in requirements for import fill material for embankments.

**Initial cost analysis indicates an overall savings to the Project of up to \$500,000.**

## 6. Schedule Analysis

This information ***has been*** amended since the submission of the previous version of this ATC to provide an updated schedule analysis.

While localized construction durations will potentially be reduced, initial schedule analysis indicates no significant schedule savings to the overall Project.

## 7. Conceptual Drawings

This information ***has been*** amended since the submission of the previous version of this ATC to include Attachment A.

**Attachment A:** Tracked changes to Schedule 10 Section 7 of the PA

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

Recent CDOT Projects including the US 6 Bridges Project and US 36 Toll Concession Project adopted similar ATCs for embankment fill material. RTD's West Corridor transit project adopted a similar contractor initiated concept to reduce importing material to the project.

## 9. Additional Information

This information **has been** amended since the submission of the previous version of this ATC to include a response to the Procuring Authorities response to ATC No. 8.0.

### **ATC 8.0 Comment #1**

As discussed at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Conceptual ATC Submission. However, the Procuring Authorities request that the Project Agreement Embankment Fill Requirements remain unchanged for the top three feet of embankment material below the Aggregate Base Course.

**KMP Response:** KMP has modified the ATC to accommodate the Procuring Authorities request.

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

### 4. List of Required Approvals

No change in the approvals is required to implement this ATC.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10 Section 7.3.3. of the PA

#### b) Proposed Revisions to address Inconsistencies

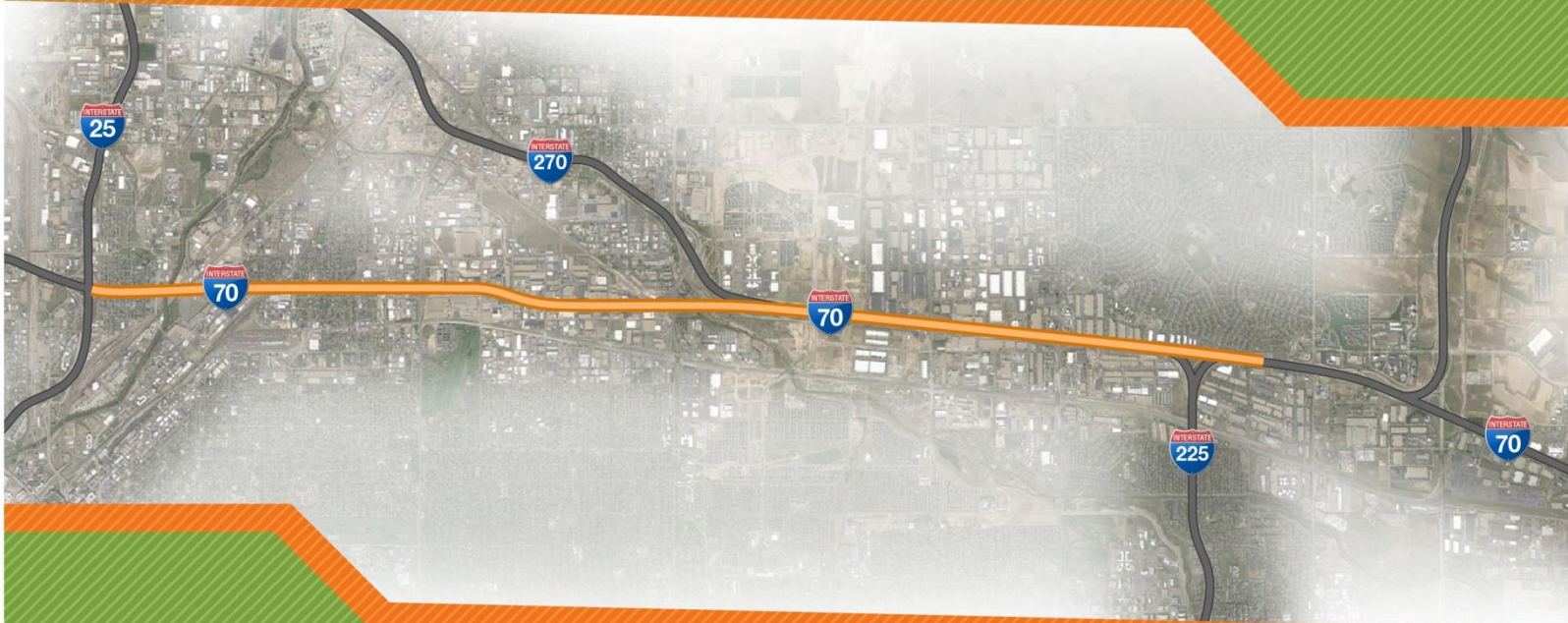
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 7 of Schedule 10

ATC 8.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016



## 7. EARTHWORK

### 7.1 Applicable Standards

All Construction Work required to be performed by the Developer pursuant to this Section shall comply with the Construction Standards, the relevant requirements listed in this Section, and Good Industry Practice.

### 7.2 Clearing and Grubbing

7.2.1 The Developer shall be responsible for all clearing and grubbing and earthwork requirements for the Construction Work.

7.2.2 The Developer shall be responsible for clearing and grubbing including, without limitation, the removal of trees, logs, stumps, brush, trash, etc. from the Site prior to the start of any Construction Work and shall comply with any additional requirements for the affected area in accordance with Schedule 17 Environmental Requirements.

7.2.3 The Developer shall conduct a pre-clear and grub meeting with the Department prior to the start of any Construction Work to agree to the limits of clearing and grubbing, removal, replacement, or transplanting of any trees and shrubs.

7.2.4 The Developer shall include clearing and grubbing limits as part of each design submittal for all Construction Work in that area. Such submittals shall include provisions for the removal, replacement or transplanting of any trees.

### 7.3 Material Requirements

7.3.1 All Construction Work shall be conducted in accordance with the CDOT *Pavement Design Manual* and the CDOT *Field Materials Manual*.

7.3.2 Unless otherwise specified in this Section, the Developer may use on-Site materials for subgrade on the Project provided that it can be demonstrated by tests that they comply with the material property requirements included in Section 203 of the CDOT Standard Specifications. Such test data shall be submitted to the Department for Information prior to use of the material on the Project.

7.3.3 ~~The R-Value of m~~Materials acquired from on-Site excavations and subsequently used in embankments on the Project shall have a minimum R-Value of 20 when placed within the upper two feet of the Ultimate configuration roadway prism. All compaction shall be in accordance with Section 203 of the CDOT Standard Specifications.

7.3.4 Preliminary subsurface investigations are included in the Reference Documents. The Developer shall conduct a supplemental soil survey to confirm/ascertain whether the existing roadway soil satisfies the material requirements of this Section if it is desired to re-use this soil in the roadway prism. If the existing roadway soils are re-used, the material will be tested as stated in the CDOT *Field Materials Manual* during construction. This supplemental soil survey shall conform to the requirements as stated in the 2016 CDOT *Field Materials Manual*. Test holes are required at a minimum of 1,000 feet. The Developer shall provide any additional mitigation required as a result of the supplemental soil survey.

7.3.5 The results of any supplemental soil surveys conducted by the Developer together with any proposed mitigation measures to address matters identified in the surveys shall be submitted to the Department for Information before any pavement and pavement-related work commences. Such information shall be submitted in a report format that clearly and concisely describes the existing soil conditions, delineates areas needing mitigation, and defines the mitigation measures. The report shall include a soil profile, boring log, and the test results.

7.3.6 Alternative subgrade treatment proposals shall be submitted to the Department for Acceptance prior to incorporation into the Construction Work. Locations where any alternative subgrade treatments are utilized on the Project shall be shown on the As-Built documents.

7.3.7 The Developer shall be responsible for identifying sources of material required for the Project.



DATE: May 19, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 9.1

Dear Mr. John Dionisio:

Your Team's ATC Submission Form for Detailed ATC 9.1 has been reviewed by the Procuring Authorities. As discussed during the April One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 9.1 proposes allowing personnel internal to the KMP organization to self-perform the Independent Quality Control (IQC) activities.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

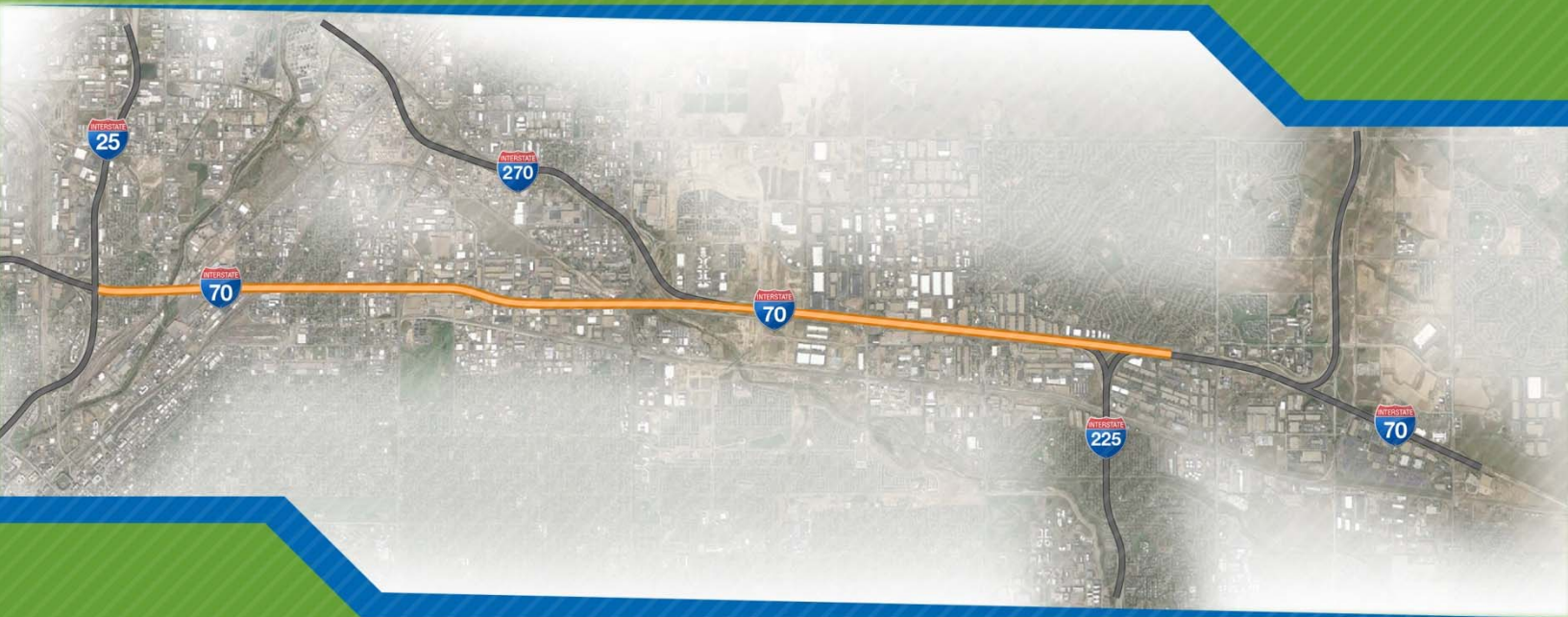




# Central 70 Project

Alternative Technical Concept Submission

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** April 12, 2016

**Central 70 Project RFP: ATC Submission No. 9.1**

**Independent Quality Control**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Response to initial submittal 9.0 was “conditional approval for re-submission as a Detailed ATC”

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

At the December 10, 2015 technical one-on-one meeting, Kiewit-Meridiam Partners (KMP) discussed using qualified and experienced personnel internal to the KMP organization to self-perform the Independent Quality Control (IQC) activities. This ATC outlines our proposed quality approach (Proposed Quality Model) which provides a **significant cost-savings** to the Department **without loss of IQC independence**. Our approach would replace the requirement for an Independent Quality Control Firm (IQCF) with internal resources, supplemented as necessary with third party firms, to self-perform the IQC activities. Currently, Schedule 8 Paragraph 6.2.5.b of the Project Agreement (PA) requires the Developer to employ an IQCF who will be responsible for administering and managing the construction IQC inspection, sampling, and testing.

#### ATC 9.1 Benefits

- ✓ \$17,000,000 Cost Savings
- ✓ Equal or Better Performance
- ✓ Provides ISO 9001:2008 **Certification**
- ✓ Supports More Efficient Construction Scheduling
- ✓ Provides Greater Opportunity for DBE/ESB/SBE Involvement and Workforce Development



Protecting the interests of the Department is of utmost importance under any quality model. To achieve this, KMP's IQC group will be completely independent of construction and design operations. This is evidenced by comparing the two organization charts on **Attachment A**. As can be seen by comparing the two charts, equal independence is maintained between the two organizations the only difference being that under KMP's proposed quality approach personnel from within our organization perform the IQC activities in lieu of using an IQCF. KMP has access to over 300 fulltime qualified quality personnel within their organization to build a tailored and experienced IQC Group for the Central 70 Project (Project).

To ensure all applicable standards and specifications are met, all KMP personnel and laboratories will be qualified in accordance with CDOT Standard Specifications for Road and Bridge Construction 2011 Section 106.04 and Colorado Procedure 10, as referenced in 23 CFR § 637.207. Additional details regarding KMP's procedure for guaranteeing personnel and laboratories are qualified will be provided in the Draft Stage I and II Quality Management Plans.

Current RFP requirements (Schedule 8 Paragraph 6.1.1) require KMP to **comply** with International Organization for Standardization (ISO) 9001: 2008, quality management processes. To meet the most stringent quality standards, KMP's IQC Group will **certify** the Project under ISO 9001: 2008. KMP's lead contractor, Kiewit Infrastructure Co., is ISO 9001: 2008 **certified** and has strong experience certifying projects to the strict ISO standards; locally, the Denver Union Station and I-225 Light Rail Projects have been ISO 9001: 2008 certified.

KMP has extensive experience in using both the KMP Proposed Quality Model and an IQCF. It is clear, given past experience, that the KMP Proposed Quality Model provides tremendous benefits to the Project. Some of the many benefits are highlighted below:

- **Cost Savings to the Department:** The total approximate cost savings of the Proposed Quality Model is approximately \$17,000,000. By allowing KMP to self-perform the IQC activities, a layer of cost multipliers is eliminated. Additionally, this allows KMP to more efficiently manage inspection and testing man-hours.
- **DBE/ESB/SBE/Workforce Development:** the KMP Proposed Quality Model provides additional opportunities to supplement KMP's IQC group with local DBEs, ESBs, SBEs, and promote workforce development in the local communities. The KMP Proposed Quality Model will also provide unique opportunities to introduce local workforce into the project through the on the job training program.
- **One Integrated Project Team:** KMP's IQC group will be fully immersed in the project. KMP's IQC group will be working solely on this Project which will ensure that all members understand the project as it progresses to ensure their safety, comprehensive understanding of the project goals, and allows for greater flexibility in scheduling.
- **Greater Familiarity with Project Requirements:** By dedicating KMP's IQC group solely to the Project, our team will have a thorough understanding of the Project's standards and specifications. This greater familiarity will help reduce common inspecting and testing errors to ensure high quality throughout the construction period.

## 2. Relevant RFP Requirements

This information has been amended since the submission of the previous version of this ATC.

KMP proposes amendments to Schedule 8 of the PA in the following paragraphs: 2.1.1.d, 6.1.1, 6.2.5.b, 6.2.5.e, and 6.2.7.e. Please reference **Attachment B** for the proposed revisions.

For a complete list of proposed drafting revisions see Part C Section 5 of this ATC.

## 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC.

KMP has a vested interest in building a high quality asset that will be easily maintained throughout the O&M period, meets the handback requirements, and exceeds the expectations of the Department, local communities, and Stakeholders. KMP is uniquely positioned to perform the Proposed Quality Model because of strong past experience and success with this approach as outlined in Section 7 of this ATC submission.

The Proposed Quality Model aligns with the Project Goals set forth in the RFP as follows:

- **Safety:** KMP's IQC group will be working onsite fulltime and will fully understand the changing conditions that take place daily throughout the course of the project which will promote a safer work environment
- **Optimizes Scope:** This ATC reduces overall cost of the Project by approximately \$17,000,000
- **Lifecycle Costs:** High quality construction will reduce O&M costs throughout the life of the project and reduce future impacts to mainline traffic
- **Minimize Impacts to the Public:** Flexibility of the IQC group will allow KMP to more effectively manage operations to complete work timely and minimize impacts to the local businesses and the travelling public
- **Community Engagement:** Provides a greater opportunity to engage local businesses and workforce to supplement the IQC Group which will promote a sense of pride and ownership of the Project throughout the community

## Port Mann and Highway 1 Improvements

"Kiewit's quality program was successfully implemented and helped contribute to the overall success of the project. Kiewit was responsible for both QC and QA activities, which was accomplished by utilizing a staff of internal QC and QA personnel including in house materials testing. One of the main factors that helped contribute to their ability to effectively perform this function internally was the utilization of a group of qualified quality professionals that were completely independent of all production activities. This group reported directly to the joint venture board, comprised of offsite executives and also liaised directly with our Quality Staff. This allowed the quality organization to be an independent entity, eliminating any potential influence from the individuals managing daily operations."

*Ed Gohl, Quality Director,  
Transportation Investment  
Corporation*

## Transportation Expansion Project (Trex)

"Within the contractor's project management structure, QA and QC managers and support staff reported directly to the joint venture board, comprised of company executives. This reporting structure allowed the quality organization to be an independent entity, eliminating potential conflicts between individuals managing daily operations and those assessing quality control and assurance."

*CDOT, 2007 NPHQ National  
Achievement Award -  
Transportation Expansion Project  
(Trex)*

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

The KMP Proposed Quality Model will positively affect the overall quality of the Project and reduce impacts for Stakeholders.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

Initial cost analyses suggest a savings to the Department of approximately \$17,000,000. Additional cost savings may be realized due to early schedule delivery or under budget work.

The KMP Proposed Quality Model has produced many high quality projects on time and under budget with cost savings of approximately 1-3% of total job cost to the Clients.

Table 1, on **Attachment A**, compares the QA/QC cost of eight of KMP's Lead Contractor's projects – four projects using the Proposed Quality Model and four projects which used an IQCF. As shown on Table 1, there is considerable savings in the QA/QC cost on the projects using the KMP Proposed Quality Model instead of an IQCF.

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

The KMP Proposed Quality Model uses a dedicated team that can respond to construction schedule requirements and work with the KMP delivery team to develop highly efficient construction schedules. This will facilitate the prompt identification and mitigation of potential issues and help foster effective solutions, thus reducing non-conforming work.

## 7. Conceptual Drawings

This information *has not been* amended since the submission of the previous version of this ATC.

N/A

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

The KMP Proposed Quality Model has been successfully used on a number of Design-Build projects and Public Private Partnerships throughout the country, including:

- Denver Union Station, Denver, CO
- Transportation Expansion Project (TREX), Denver, CO
- Port Mann Highway 1 Project, Vancouver B.C. Canada

- I-15 Project, Salt Lake City, UT

The success of the KMP Proposed Quality Model is best displayed through the words of former clients as shown at right and on **Attachment A**.

## 9. Additional Information

This information **has been** amended since the submission of the previous version of this ATC.

As requested in the response to the conceptual ATC Submission 9.0, KMP is providing the following list of projects and associated client contacts where the proposed Quality Model has been successfully implemented.

Project	Location	Client	Client Contact	Phone Number
Denver Union Station	Denver, CO	DUSPA (Denver Union Station Procuring Authority)	[REDACTED]	[REDACTED]
I-25 SE Corridor (T-REX)	Denver, CO	T-REX Project Team	[REDACTED]	[REDACTED]
Gateway/Port Mann Hwy 1	Vancouver, B.C. Canada	TI-Corp (Transportation Investment Corporation)	[REDACTED]	[REDACTED]
I-15	Salt Lake City, UT	UDOT	[REDACTED]	[REDACTED]
DART Orange Line - 1&2	Irving, TX	DART (Dallas Area Rapid Transit)	[REDACTED]	[REDACTED]
DART Orange Line - 3	Irving, TX	DART (Dallas Area Rapid Transit)	[REDACTED]	[REDACTED]
Mid Jordan LRT	Salt Lake City, UT	UTA (Utah Transit Authority)	[REDACTED]	[REDACTED]

We have also attached Quality Management Plans from T-REX (**Attachment C**) and Port Mann (**Attachment D**). These two plans portray the continuous improvement that takes place internally to enhance our Quality Program and to demonstrate our long term proven experience implementing this Quality Model. The Draft Stage I and Stage II plans to be submitted with the Technical Proposal will be updated for the specific Project requirements and reflect the evolution of our Quality Program to clearly depict Process Control and Quality Control that are both independent of each other and of all construction and design operations.

- T-REX QMP (**Attachment C**) – please reference the following sections to see how Quality Control was clearly separated from the construction and design operations.

(Page numbers referenced below are associated with this Detailed ATC 9.1 Submission pages 1-1553.)

- Quality System Manual: **Organization and Responsibility**
  - Sections 4.5, 4.6, 4.7, 4.8, 4.10, 4.11, 4.15 (Pages 34-37)
- Quality System Procedure: UP-999-Q13 **Test Procedures and Reports**
  - Section 2-5 (Pages 149-150)
- Port Mann QMP (**Attachment D**) – please reference the following sections to see how the Quality Control was clearly independent of the construction and design operations. (Page numbers referenced below are associated with this Detailed ATC 9.1 Submission pages 1-1553.)
  - Quality Manual: **Responsibility and Authority**
    - Section 5.5.1 b, c, d, g, h, j , Figure 5.1 and Figure 5.1a (Pages 959-966)
    - Section 8.2.6, 8.2.7 (Pages 983-984)
  - Quality System Procedure 10: **Inspection and Testing**
    - Sections 3.1, 5.1. & 5.2 (Pages 1102 and 1105-1106)
  - Construction Quality Management Plan
    - Section 5.5.2 (Pages 1203-1202)
    - Section 5.5.7 (Page1207)
    - Sections 5.5.9.2, .3, .4 (Pages 1209-1211)
    - Appendix B (Page 1228)

The commitment to quality for KMP is portrayed through the commitment of the Lead Contractor Kiewit and the Lead Designer Parsons Brinkerhoff (PB). See **Attachment E** for Quality Commitment letters from both Kiewit and PB.



## C. Detailed ATC Requirements

### 1. Risks

The KMP Proposed Quality Model will positively affect the overall quality of the Project and will not create any additional risks for the Department or other Project stakeholders.

The following safe guards will be in place throughout the construction period to ensure the IQC staff is completely independent and not responsible for the production of any construction or design operations.

- **ISO Certification Reviews:** The QMP will be certified under ISO 9001:2008 (or equivalent ISO standard in effect when the QMP is submitted); this is a three year certificate and the QMP will be audited by the certifying organization periodically to maintain certification through the construction and design period
- **Organizational Independence:** As shown on the proposed organization chart in **Attachment A** the Quality Control group including PQM, IQCM, and IDQM is independent from the construction and design operations and the PQM communicates directly with the Department. All records of inspection and testing activities will be submitted directly to the Department.
- **Quarterly Quality Only Meetings:** KMP will hold quarterly quality only meetings with the Department and KMP Executive Management to have an open and transparent forum to review the quality program without the influence of design or construction.
- **Four Square Matrix:** KMP will utilize the Four Square Matrix, shown on the following page, to track project and quality issues. This matrix will be reviewed weekly with the Department in the Weekly Quality Meeting and will be used to clearly identify items that the Department identifies as on-going issues, current issues, good trends, and steady performances. The Matrix is a visual tool for KMP and the Department to use to communicate issues and good trends on the project and to ensure concerns are being addressed. See **Attachment F** for the Four Square Matrix procedure.



## Central 70 Project

### Project Performance Matrix - [Month Year]

<p style="text-align: center;"><u>On-Going Issues</u></p> <p>A change in the process has been initiated for these issues.</p>	<p style="text-align: center;"><u>Steady Performers</u></p> <p>The process change is now a standard practice.</p> <p>No further changes are required.</p>
<p style="text-align: center;"><u>Current Issues</u></p> <p>STARTING POINT FOR ALL ISSUES: Performance Issue identified where a process change is required to <u>prevent</u> the problem from recurring.</p> <p>Action has not been taken.</p>	<p style="text-align: center;"><u>Good Trends</u></p> <p>Improvement in quality outcomes for these issues has been verified.</p> <p>There is still room for improvement.</p> <p>The process change has not been made.</p>

- **Internal Audits:** Kiewit Corporate will perform internal audits of the quality program annually to ensure the QMP is being followed.
- **Operation and Maintenance Oversight:** KMP's O&M group is empowered through the interface agreement to participate in QC oversight throughout the construction period to verify that the Work is installed per the PA **and the jointly developed design.**
- **Department Oversight:** The Department Quality Oversight is another layer that will validate compliance with the PA; KMP invites the Department to participate at any step throughout the construction and design process to perform over-the-shoulder checks, testing verification, and to facilitate Department audits.
- **Stop Work Authority:** All IQC personnel have the authority to stop Work, as appropriate, that does not comply with the requirements of the PA.
- **Management Commitment:** Management commitment is such that IQC staff has no role in management of production or construction and design operations; see attached Management Commitment letters provided in **Attachment E.**

KMP understands the importance for independence between the construction and design operations, Process Control, and IQC. It is imperative to KMP that all three of these elements remain independent of each other to ensure that the Quality Program exceeds the expectation of the Department.

## 2. Handback

There is no change in handback procedures or requirements due to this ATC. However, delivering a project using proven design and construction quality processes is essential for optimizing maintenance, operating, and life cycle performance and costs. The proposed Quality

Model ensures that each step of the process will be performed and documented leading to asset quality of the Project elements that meet or exceed expectations.

### 3. Right-of-Way

This ATC does not require any additional cost or procurement of right-of-way (ROW). ROW will be incorporated in the QMP as required per the PA to ensure that all aspects of the PA are accounted for during the construction and design period.

### 4. List of Required Approvals

N/A

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised:

- Project Agreement
  1. Annex A, Part B: Abbreviation of IQCF
- Schedule 8 (Project Administration) of the Project Agreement
  1. 2.1.1.d
  2. 6.1.1
  3. 6.2.5.b
  4. 6.2.5.e
  5. 6.2.7.e
  6. Appendix B - Certificate of Quality Manager
- Schedule 27 (Key Personnel) of the Project Agreement
  1. Project Quality Manger – To be Seconded to/employed by
  2. Independent Design Quality Manager – To be Seconded to/employed by
  3. Independent Quality Control Manager – To be Seconded to/employed by

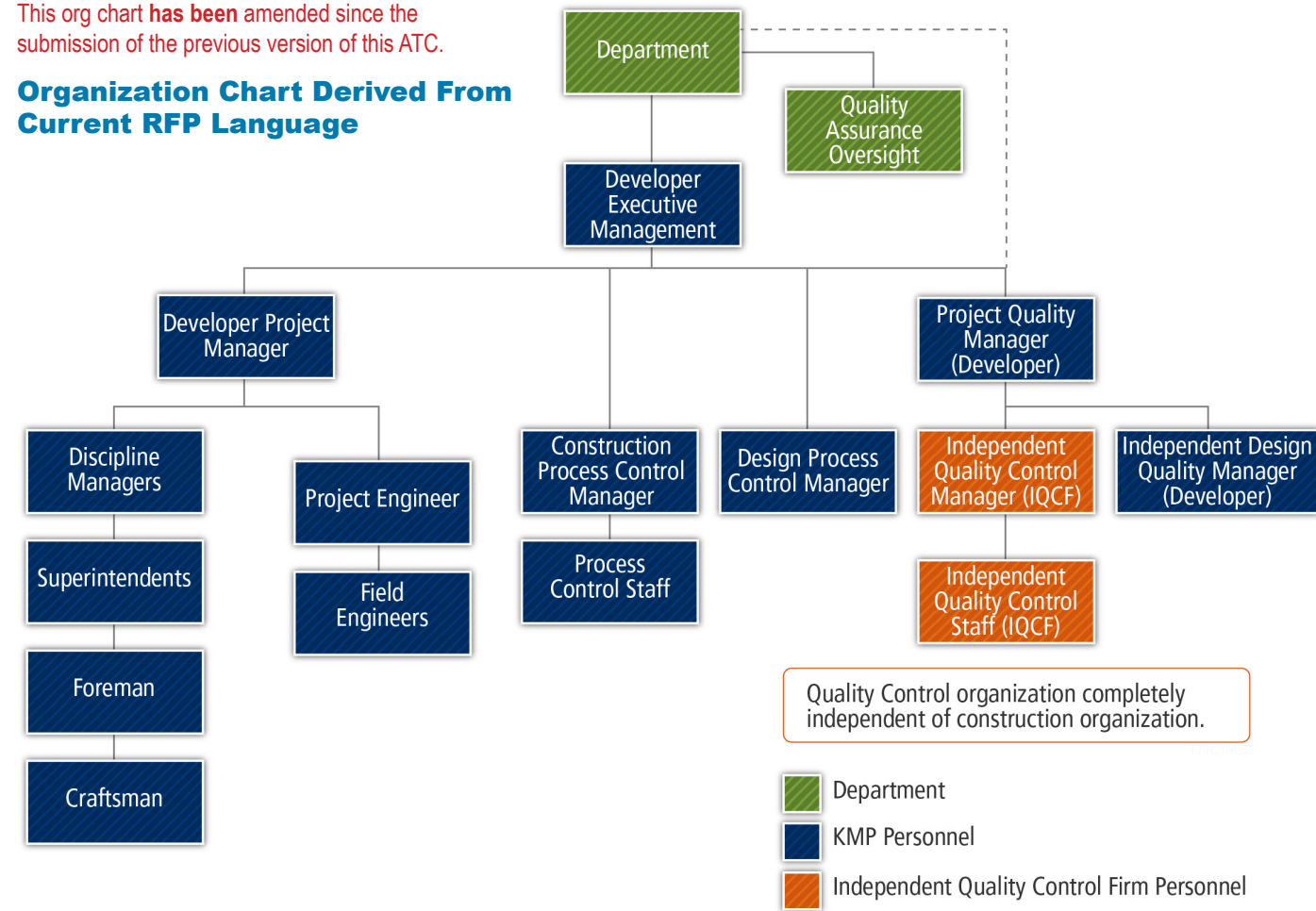
#### b) Proposed Revisions to address Inconsistencies

KMP has included the following files with tracked changes for the changes in the sections listed above.

- Project Agreement as shown in **Attachment G**
- Schedule 8 (Project Administration) of the Project Agreement as shown in **Attachment H**
- Schedule 27 (Key Personnel) of the Project Agreement as shown in **Attachment I**

This org chart has been amended since the submission of the previous version of this ATC.

**Organization Chart Derived From Current RFP Language**

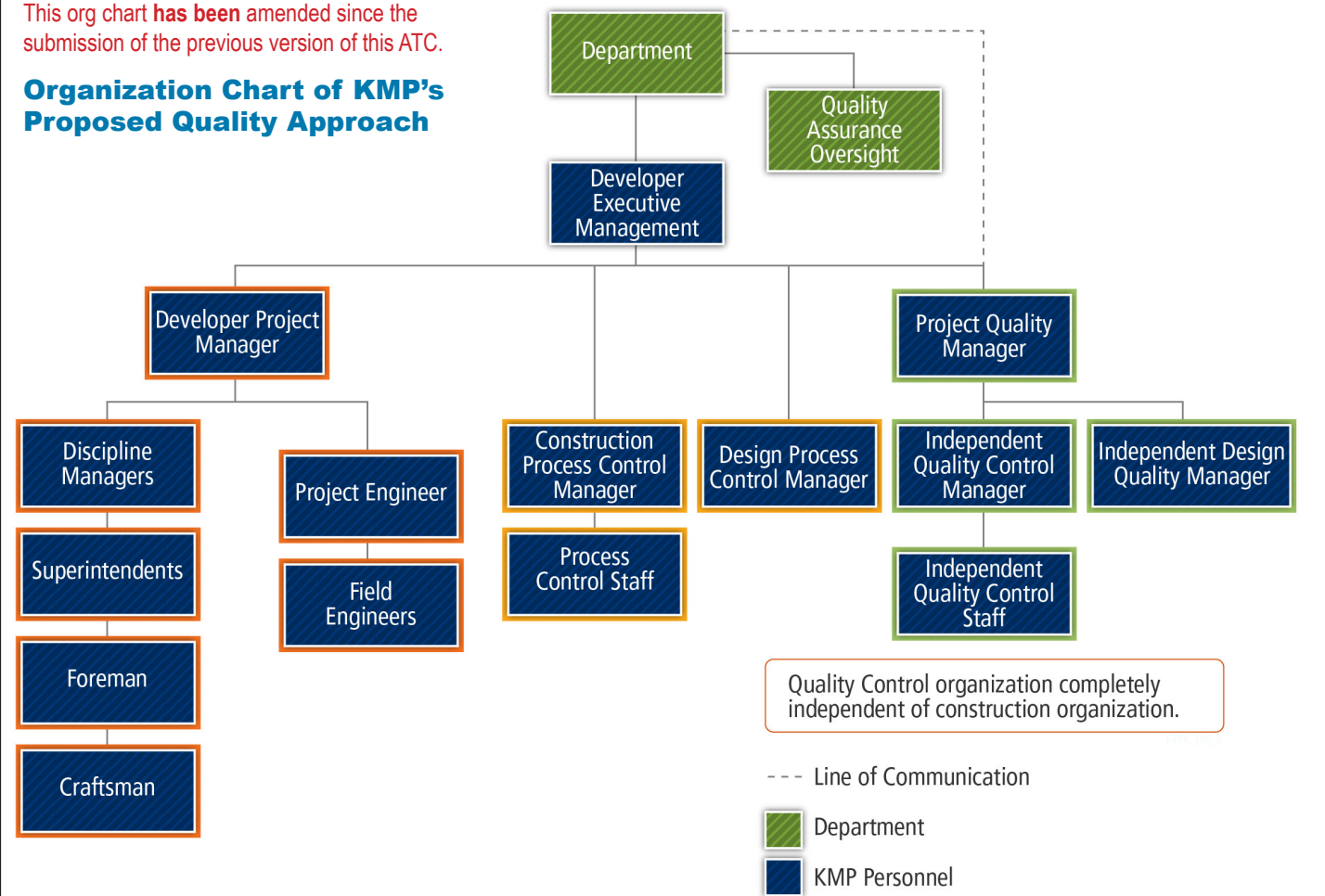


Quality Control organization completely independent of construction organization.

Department  
 KMP Personnel  
 Independent Quality Control Firm Personnel

This org chart has been amended since the submission of the previous version of this ATC.

**Organization Chart of KMP's Proposed Quality Approach**



Quality Control organization completely independent of construction organization.

--- Line of Communication

- Department
- KMP Personnel
- KMP Construction
- KMP Process Control
- KMP IQC

**Table 1 - Project Comparison**

Project	Location	Project Value	IQCF (Y/N)	Total QA/QC as a % of total cost	QA/QC Cost per Craft Man-hour
Denver Union Station	Denver, CO	\$387,000,000	N		
I-25 SE Corridor (T-REX)	Denver, CO	\$1,150,000,000	N		
Gateway/Port Mann Hwy 1	Vancouver, B.C. Canada	\$2,280,000,000	N		
I-15 Project	Salt Lake City, UT	\$1,260,000,000	N		
DFW Connector	Dallas, TX	\$910,000,000	Y		
Border West Expressway	El Paso, TX	\$415,000,000	Y		
JC Gateway Interchange	Lenexa, KS	\$271,000,000	Y		
Intercounty Connector, Contract B	Beltsville, MD	\$458,000,000	Y		

**Denver Union Station**

"Kiewit's quality program allowed our RTD team to be involved during the daily activities and the construction of the work to ensure that when it came time to turn over the work, all the problems had been resolved and we were in a position to accept the product." - Jeff Kay, RTD Denver Union Station Deputy Project Manager

**I-15 Corridor Reconstruction**

"UDOT had a tremendous challenge to deliver the \$1.7 billion, I-15 design-build project in four and one-half years that would showcase Salt Lake City to the world as it was about to host the 2002 Winter Olympic Games. Needing to completely reconstruct 17 miles of freeway, including 2 major freeway to freeway interchanges and 140 bridges, under 200,000 vehicles a day while producing the highest quality facility possible was daunting. As the first DOT led mega design-build project undertaken in the U.S. and prior to FHWA regulations on design-build and QC/QA/oversight requirements, I had the responsibility to develop a quality management approach that met UDOT's high quality expectations and deliver the project on time and on budget. I knew we did not have the time nor the budget to try and "inspect in quality" that quality had to be job-one for the contractor and workers that were to build to facility. Thus, Wasatch Contractors, with Kiewit as the Lead Contractor, performed the quality control functions for the project and also had the quality assurance responsibilities. UDOT was responsible to oversee the contractor's efforts and validate the work that was produced met the contract requirements and our expectations. The combined result of UDOT's and the Contractor's efforts, has become a model to state DOTs across the country on how to deliver a mega design-build project on time and on budget while meeting the highest quality expectations and established a benchmark for FHWA as they developed the federal regulations on how to structure a quality program for design-build delivery." - David Downs, UDOT I-15 Project Director



REFERENCE	SECTION	PAGE
B.1	OVERVIEW DESCRIPTION	2
B.5	COST AND BENEFIT ANALYSIS	4
B.8	PAST USE	5
C.1	RISKS	6

ALTERNATIVE TECHNICAL CONCEPT  
**INDEPENDENT QUALITY CONTROL**  
 ATTACHMENT A

ATC NUMBER  
**9.1**  
 SHEET NUMBER 1 OF 1



This attachment has been amended since the submission of the previous version of this ATC.

Paragraph 2.1.1.d RFP Text:

“A quality management organizational chart and description, indicating the roles, responsibilities and structure of the respective quality management, Process Control and IQC staff (Developer and IQCF),, down to and including field inspection, and testing for the Work for all shifts;”

Paragraph 2.1.1.d Proposed Revision:

“A quality management organizational chart and description, indicating the roles, responsibilities and structure of the respective quality management, Process Control and IQC staff (~~Developer and IQCF~~), down to and including field inspection, and testing for the Work for all shifts;”

Paragraph 6.1.1 RFP Text:

“...Processes and procedures established in the QMP shall comply with International Organization for Standardization (ISO) 9001:2008, or equivalent ISO standard in effect on the date the QMP is submitted...”

Paragraph 6.1.1 Proposed Revision:

“...Processes and procedures established in the QMP shall **comply be certified under** International Organization for Standardization (ISO) 9001:2008, or equivalent ISO standard in effect on the date the QMP is submitted...”

Paragraph 6.2.5, b RFP Text:

“Developer shall secure for the Project an Independent Quality Control Firm (IQCF) which shall be an independent engineering/testing firm employed by the Developer responsible for administering and managing the construction IQC Inspection, sampling, and Testing. The IQCF and any Subcontractors or sub-consultants thereto must not be a Developer Related Entity or any Affiliate thereof.”

Paragraph 6.2.5, b Proposed Revision:

“Developer shall **secure for the Project an Independent Quality Control Firm (IQCF) which shall be an independent engineering/testing firm employed by the Developer ensure Quality Control is being performed by a group completely independent of anyone responsible for construction of the work. Independent Quality Control (IQC) shall be an independent group employed by the Developer** responsible for managing the construction IQC Inspection, sampling, and Testing. The IQCF and any subcontractors or sub-consultants thereto must not **be a Developer Related Entity or any Affiliate thereof have any responsibilities for scheduling or production activities.**”

Paragraph 6.2.5, e RFP Text:

“At a minimum, the IQCF testing shall include the observations, measurements, and documentation specified in the CDOT Field Materials Manual and its Frequency Guide Schedule for minimum materials sampling, testing, and inspection for all quality acceptance tests required. Items identified as pre-tested or pre-inspected by the Department shall remain the responsibility of the Developer. The IQCF shall document the results and show if the test passed or failed based on the “pass/fail criteria” established in the Project Agreement. The IQCF shall include failing tests results in the test documentation.”

Paragraph 6.2.5, e Proposed Revision:

“At a minimum, the **IQCF IQC** testing shall include the observations, measurements, and documentation specified in the CDOT Field Materials Manual and its Frequency Guide Schedule for minimum materials sampling, testing, and inspection for all quality acceptance tests required. Items identified as pre-tested or pre-inspected by the Department shall remain the responsibility of the Developer. The **IQCF IQC** shall document the results and show if the test passed or failed based on the “pass/fail criteria established in the Project Agreement. The **IQCF IQC** shall include failing tests results in the test documentation.”

Paragraph 6.2.7, e RFP Text:

“The Developer shall assign an on-Site Independent Quality Control Manager (IQCM) who shall be an employee of the IQCF and shall be responsible for management of the IQC aspect of the QMP. The IQCM shall report to the PQM and to the Department. The IQCM shall not report to any person or party directly responsible for design or construction production.”

Paragraph 6.2.7, e Proposed Revision:

“The Developer shall assign an on-Site Independent Quality Control Manager (IQCM) who shall be an **employee of the IQCF independent of production** and shall be responsible for management of the IQC aspect of the QMP. The IQCM shall report to the PQM and to the Department. The IQCM shall not report to any person or party directly responsible for design or construction production.”



REFERENCE	SECTION	PAGE
B.2	RELEVANT RFP REQS	3

ALTERNATIVE TECHNICAL CONCEPT  
**INDEPENDENT QUALITY CONTROL**  
ATTACHMENT B

ATC NUMBER  
**9.1**  
SHEET NUMBER 1 OF 1



# Central 70 Project

Attachment C – TREN Quality Management Plan

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission





# Central 70 Project

Attachment D – Port Mann Quality Management Plan

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

NOT INCLUDED





# Central 70 Project

## Attachment E – Quality Commitment Statements

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## Our Commitment to Quality

### QUALITY AT EVERY STEP

At Kiewit, our philosophy on quality is simple — meet or exceed our clients expectations through continuous quality improvement and by building our work right the first time.

We do this by executing a formal quality program designed to ensure we:

**Meet requirements.** We create work plans that describe the means and methods of performing our work. Pre-activity meetings communicate how our work plans fulfill contract, design and client requirements.

**Exceed clients' expectations.** We listen and act upon clients' concerns. We treat clients with respect and are transparent in our dealings. Our goal is to build long-term trusting relationships with our clients at all levels.

**Eliminate rework.** We identify and immediately report quality issues whenever they occur. If there is an issue, root cause analysis is performed to eliminate the causes of quality issues and prevent future occurrence.

**Demonstrate continuous quality improvement.** By consistently focusing on quality, we commit to excellence in all that we do. We encourage new and innovative ideas to enhance our performance.

**Build work right the first time.** Our work is continually checked by the supervisors and craftsmen who build the work, ensuring it is built “right the first time.”



# Competing through Quality

About five years ago, a question we posed to ourselves was, “how do we differentiate ourselves from the competition?” The answer became “quality.”

The difficulty in establishing a quality initiative at Kiewit was that there wasn't a major problem to be solved. Like any other contractor, we sometimes fell short, but for the most part our people produced quality work for our customers.

And that was the problem. We were “like any other contractor.” We did not measure up to our self-image as an industry leader and did not measure up to customer expectations of Kiewit.

Trying to produce change in the absence of a crisis is a tall order. But through the leadership of the initial chair of our Corporate Quality Committee, Steve Hansen, and a then newly-appointed Vice President of Quality, Larry Cochran, there has been a significant culture shift.

The first challenge was to have everyone see the value in approaching quality as a process rather than just an end product. In recent years, project owners have shifted more responsibility for quality program requirements to the contractor. That requires documentation to substantiate that we are building quality into projects each step of the way.

The other challenge was determining how to best fit a culture of quality into the existing culture. Improvement at Kiewit comes about through measurement, accountability and competition, so Steve and Larry's team worked to develop standards that fit those principles. Owners and clients have noted that Kiewit is virtually alone among contractors in establishing self-imposed rather than owner-imposed yardsticks for measuring quality performance.

Striving for excellence in quality has produced an additional benefit that probably should have been anticipated. The planning, organization and management controls it takes to ensure “quality at every step” has helped instill quality into other aspects of our business. The disciplines involved in striving for quality has made us better contractors, and a better company.

Like everything else in our business, the world doesn't stand still. We may have had a head start, but other contractors are getting the message from owners and have begun establishing their own quality programs. And while our quality performance is far better than five years ago, the expectations of project owners are requiring even more focus than before. To borrow a phrase from Peter Kiewit, you might say they are “pleased, but not satisfied” with what we've accomplished.

One of the major successes of Kiewit's Quality Program has been the quality program itself. I congratulate everyone on a successful start-up of an important initiative, and look forward to seeing how much further we can take it over the next five years.



**Bruce Grewcock**  
President and CEO

## PRESIDENT'S MESSAGE

**THE MAGAZINE OF KIEWIT CORPORATION**  
**2008 Volume 64**  
Special Quality Program Five-Year Anniversary Issue

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## CONTRIBUTORS

*Dave Borisky, Scott Chaney, Larry Cochran, Terry Constable,  
Brian Druke, Katie Fields, Tom Harter, Stephen Liu, Frank McDowell,  
Herb Reuss, Terry Scott, Mike Shaw*



**To:** All U.S. Staff  
**From:** Gregory A. Kelly, President and CEO, U.S.  
**Subject:** **Quality Policy**  
**Date:** February 29, 2016

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I personally affirm WSP | Parsons Brinckerhoff's commitment to quality. Quality professional services are required from every employee in the company. To illustrate our solid quality commitment, we will conduct our projects in a manner that is consistent with applicable regulatory requirements, company standard operating processes, and standard industry practices.

The objectives of the quality system are:

- to satisfy all business requirements in a cost-effective manner by doing work correctly the first time and striving for continuous improvement in our work processes
- to provide innovative high-quality methods used to deliver our professional services through teamwork and technical excellence,
- to seek ways to meet or exceed our clients' needs and increase client satisfaction with our service.

Your contribution to quality goals and objectives is fundamental to maintaining WSP | Parsons Brinckerhoff's position at the forefront of the industry. Let's work together to meet these objectives.

A handwritten signature in blue ink, appearing to read 'G. Kelly', with a long horizontal flourish extending to the right.

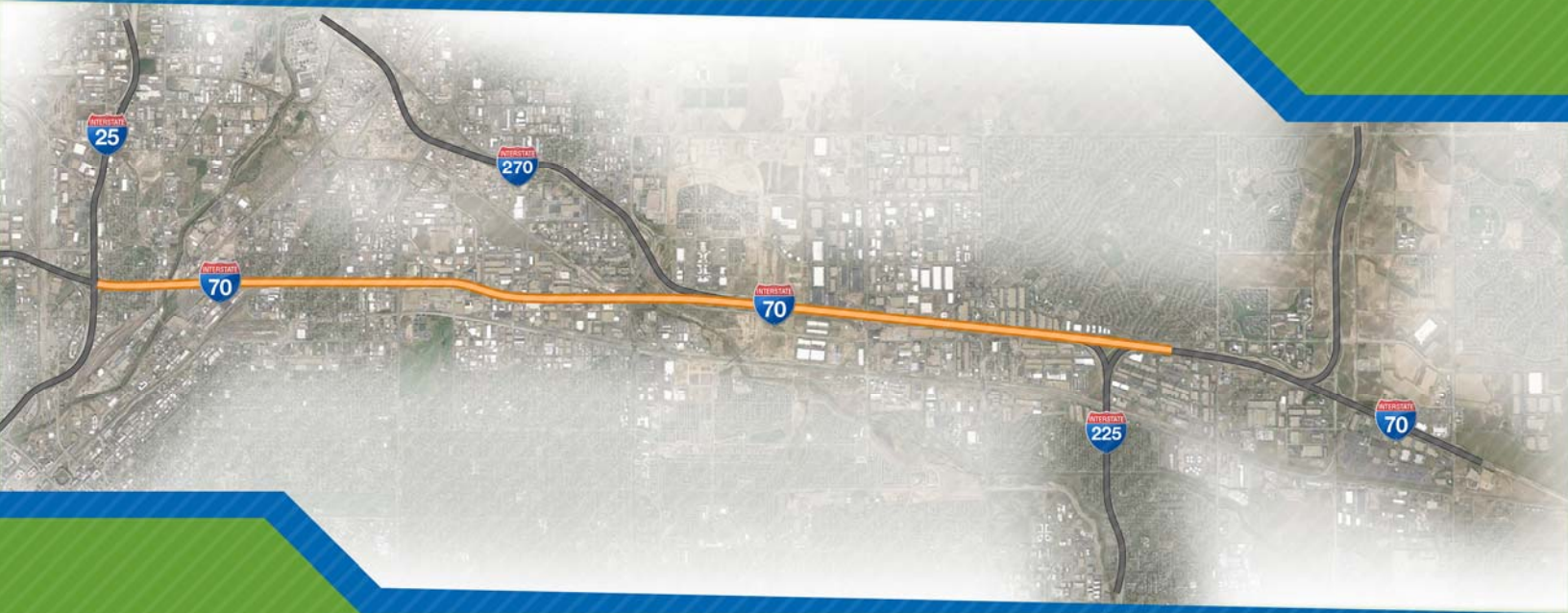
Gregory A. Kelly  
President & CEO, U.S.  
March 2016



# Central 70 Project

Attachment F – Four Square Matrix

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

# Four-Square Performance Issues Matrix Procedure

## Purpose

To publicize and organize performance issues on a recurring basis for the purpose of discussion among the project team and the client's representatives. To show and improve on client hot buttons at a glance.

## Definition of a Performance Issue

A performance issue is something that requires a process change to prevent the problem from recurring. A *process* change involves changing:

- Procedures (the written way the organization wants work performed)
- Methods (the way an individual does work)
- Tools (including software, checklists, hardware, etc.)
- Equipment
- Skill Level

## A Dynamic Chart

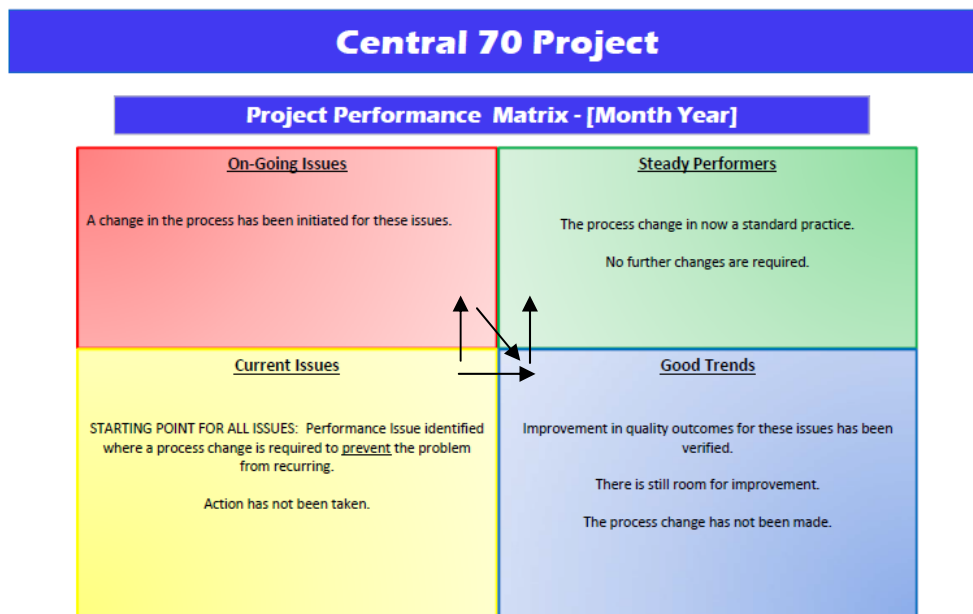
The Four-Square Performance Issues Matrix is a snapshot of performance issues on a regular day/week/month basis. This tool is most effective when formulated and reviewed during discussions with the client and project team.

Issues start in Current Issues and then move to either Outgoing Issues or Good Trends; from the Good Trends issues move to Steady Performance. Arrows on the graphic below show movement of the issues. If an issue is in the Current Issues box for more than 30 days and the project team cannot agree that it is trending toward good, it needs to be moved to the Ongoing Issues box. Issues in the Ongoing Issues box should be subjected to a root cause analysis.

The value of this tool is seen through increased communication of performance issues and better understanding of current performance issues by the project team and the client. Everyone on the project can see at a glance what the hot issues are. Project management can focus on issues that are assigned to the yellow and red areas in order to move them over to the green and blue areas on the matrix. Process improvements are easy to display by simply laying out sequential matrices side-by-side to show the movement of an issue from identification through resolution.

When you start an issue in the 4 Square it needs to be started in the Current Issues box. Do not add NEW items to any other box on the matrix. Items can stay in the boxes for the time allotted below:

**Current Issues:** 1 month. **Ongoing Issues:** 2 months at most without a RCA. **Good Trends:** 2 months. **Steady Performance:** 2 months.







# Central 70 Project

Attachment G – Tracked Changes to Project Agreement

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



# Project Agreement for the Central 70 Project

**COLORADO BRIDGE ENTERPRISE,  
HIGH PERFORMANCE TRANSPORTATION ENTERPRISE,  
and  
[DEVELOPER]**

Dated [ ]

**Part B: Abbreviations**

Except as otherwise specified herein or as the context may otherwise require, the following abbreviations set out below are provided as references for purposes of the Technical Requirements, Table 6A.1 and Table 6A.2 only:

<u>"ABC"</u>	means aggregate base course.
<u>"AC"</u>	means alternating current.
<u>"ACL"</u>	means access control list.
<u>"ADA"</u>	means Americans with Disabilities Act.
<u>"AID"</u>	means automatic incident detection.
<u>"AHJ"</u>	means Authority Having Jurisdiction.
<u>"ALPR"</u>	means Automatic License Plate Recognition.
<u>"AMCA"</u>	means Air Movement and Control Association.
<u>"ANSI"</u>	means American National Standards Institute.
<u>"APCD"</u>	means Air Pollution Control Division.
<u>"APEN"</u>	means Air Pollution Emission Notice.
<u>"AREMA"</u>	means American Railway Engineering and Maintenance-of-Way Association.
<u>"ATM"</u>	means Active Traffic Management.
<u>"ATR"</u>	means Automatic Traffic Recorders.
<u>"AVI"</u>	means Automatic Vehicle Identification.
<u>"AVL"</u>	means Automated Vehicle Locator.
<u>"BACR"</u>	means Baseline Asset Condition Report.
<u>"BMP"</u>	means Best Management Practices.
<u>"CCD"</u>	means City and County of Denver.
<u>"CCMS"</u>	means Command, Control, and Monitoring System.
<u>"CCP"</u>	means Crisis Communications Plan.
<u>"CCTV"</u>	means Closed Circuit Television.
<u>"CDPHE"</u>	means Colorado Department of Public Health and Environment.
<u>"CDPS"</u>	means Colorado Discharge Permit System.
<u>"CDPS-SCP"</u>	means Colorado Discharge Permit System-Stormwater Construction Permit.
<u>"CFD"</u>	means Computational Fluid Dynamics Model.
<u>"CLOMR"</u>	means Conditional Letter of Map Revision.
<u>"CMS"</u>	means cable management system.
<u>"COTS"</u>	means conventional, off-the-shelf.
<u>"CPCM"</u>	means Construction Process Control Manager.
<u>"CPM"</u>	means Critical Path Method.
<u>"CPW"</u>	means Colorado Parks and Wildlife.
<u>"CRAL"</u>	means Construction of Relocation Acceptance Letter.
<u>"CSL"</u>	means cross sonic log.
<u>"CSP"</u>	means Colorado State Patrol.
<u>"CTMC"</u>	means Colorado Transportation Management Center.
<u>"CTMS"</u>	means Colorado Transportation Management Software.
<u>"CUHP/EPA-SWMM"</u>	means Colorado Urban Hydrograph Procedure/Environmental Protection Agency Storm Water Management Model.
<u>"CWCP"</u>	means Construction Work Communications Plan.
<u>"CWDM"</u>	means coarse wavelength division multiplexing.
<u>"CVS"</u>	means Cover Ventilation System.
<u>"DBE"</u>	means Disadvantaged Business Enterprise.
<u>"DCS"</u>	means Document Control System.
<u>"DPCM"</u>	means Design Process Control Manager.
<u>"DRAL"</u>	means Design of Relocation Acceptance Letter.
<u>"DRIRR"</u>	means Denver Rock Island Railroad.
<u>"DTD"</u>	means Division of Transportation Development.
<u>"DWDM"</u>	means dense wavelength division multiplexing.
<u>"ECS"</u>	means Erosion Control Supervisor.
<u>"ECWP"</u>	means Environmental Compliance Work Plan.

<u>"EDB"</u>	means extended detention basins.
<u>"EDP"</u>	means electrical distribution panels.
<u>"EIS"</u>	means Environmental Impact Statement.
<u>"EM"</u>	means Environmental Manager.
<u>"EPA"</u>	means Environmental Protection Agency.
<u>"ERP"</u>	means Emergency Response Plan.
<u>"ESAL"</u>	means 18-kip Equivalent Single Axle Loads.
<u>"ESB"</u>	means Emerging Small Business.
<u>"ETC"</u>	means Electronic Toll Collection.
<u>"FCM"</u>	means fracture critical member.
<u>"FDAS"</u>	means Fire Detection and Alarm System.
<u>"FDS"</u>	means Functional Design Specification.
<u>"FEE"</u>	means Fee interest or ownership of the fee simple estate in real property.
<u>"FFFS"</u>	means Fixed Firefighting System.
<u>"FMV"</u>	means Fair Market Value.
<u>"GUI"</u>	means graphical user interface.
<u>"GPS"</u>	means Global Positioning System.
<u>"HBP"</u>	means hot bituminous pavement.
<u>"HDPE"</u>	means high-density polyethylene.
<u>"HGL"</u>	means hydraulic grade line.
<u>"HLMR"</u>	means high load multi-rotational.
<u>"HMA"</u>	means hot mix asphalt.
<u>"HOV"</u>	means high occupancy vehicle.
<u>"HVAC"</u>	means heating, ventilation, and air conditioning.
<u>"IA"</u>	means Independent Assurance.
<u>"IAR"</u>	means Interstate Access Request.
<u>"IBC"</u>	means International Building Code.
<u>"IDQM"</u>	means Independent Design Quality Manager.
<u>"IESNA"</u>	means Illumination Engineering Society North America.
<u>"IGMP"</u>	means Internet Group Management Protocol.
<u>"IMP"</u>	means Incident Management Plan.
<u>"IQC"</u>	means Independent Quality Control.
<u>"IQCF"</u>	<del>means Independent Quality Control Firm.</del>
<u>"IQCM"</u>	means Independent Quality Control Manager.
<u>"INWMP"</u>	means Integrated Noxious Weed Management Plan.
<u>"IP"</u>	means Internet Protocol.
<u>"IRI"</u>	means International Roughness Index.
<u>"ISO"</u>	means International Organization for Standardization.
<u>"ITS"</u>	means Intelligent Transportation Systems.
<u>"IVR"</u>	means Interactive Voice Response.
<u>"LCD"</u>	means Liquid Crystal Display.
<u>"LED"</u>	means light emitting diode.
<u>"LEP"</u>	means Limited English Proficient.
<u>"LFD"</u>	means load factor design.
<u>"LFR"</u>	means a load factor rating.
<u>"LOMR"</u>	means Letter of Map Revision.
<u>"LP"</u>	means Lighting Protection.
<u>"LRFD"</u>	means load resistance factor design.
<u>"LRFR"</u>	means aggregate base course.
<u>"LSOH"</u>	means low smoke, zero halogen.
<u>"LUS"</u>	means Lane Use Signal.
<u>"M-E"</u>	means mechanistic-empirical.
<u>"MBTA"</u>	means Migratory Bird Treaty Act.
<u>"MEP"</u>	means mechanical, electrical, and plumbing.
<u>"MHCP"</u>	means Mile High Courtesy Patrol.
<u>"MHT"</u>	means Methods of Handling Traffic.





# Central 70 Project

Attachment H – Tracked Changes to Schedule 8

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## Schedule 8 Project Administration

### 1. GENERAL REQUIREMENTS

The Developer shall be solely responsible for the management and administration of the Work, coordinating all activities necessary to perform the Work, and reporting and documenting all Work and ensuring the quality of the Work in conformance with the Agreement. The Developer shall satisfy all functional needs and characteristics of Project administration and this Schedule 8.

### 2. PROJECT MANAGEMENT PLAN

#### 2.1. General Requirements

2.1.1. The Developer shall submit a Project Management Plan (PMP) that encompasses the Term of the Project Agreement, for Acceptance by the Department, prior to the issuance of NTP1, which is consistent with and expands upon the draft Project Management Plan submitted with the Proposal. The PMP shall provide clear detail of the Developer's overall approach to its team organization, structure, and management processes, and shall describe the scope, goals, and objectives of Project approach and intended results and be fully compliant with all provisions of the Project Agreement. The PMP shall identify by signature page and date, the title of the qualified professionals who are responsible for planning, reviewing, approving, reporting, monitoring, controlling, implementing, revising, and issuing the PMP, including revisions. At a minimum, the PMP shall include the following (where applicable relating to both Developer and its Subcontractors but also, where applicable, clearly identifying the division of roles and responsibilities between the Developer and its Subcontractors):

- a. An organizational chart and description, indicating the Developer's overall team structure including all Key Personnel, management staff and their reporting relationships for all Work;
- b. A design organizational chart and description, indicating the roles, responsibilities and structure of the Developer's design staff, down to and including discipline leads and the staff positions proposed in each discipline;
- c. A construction organizational chart and description, indicating the roles, responsibilities and structure of the Developer's construction staff, down to and including field superintendents and the staff positions proposed under each field superintendent for the Work for all shifts;
- d. A quality management organizational chart and description, indicating the roles, responsibilities and structure of the respective quality management, Process Control and IQC staff (~~Developer and IQCF~~), down to and including field inspection, and testing for the Work for all shifts;
- e. An Operations and Maintenance (O&M) organizational chart, and description, indicating the roles, responsibilities and structure of the O&M staff, both during the Construction Period and the Operating Period, down to and including the roadway, drainage, bridge, tolling systems and Intelligent Transportation Systems (ITS) discipline leads for any O&M related Work;
- f. A design management process, including a description of how design personnel will interface with the Department, construction, quality management and O&M organizations, in accordance with the Schedule 8, Quality Management Plan requirements;
- g. A construction management process, including the independence of Process Control (PC) personnel and activities from IQC personnel and activities, interface with the IQC and roles and responsibilities for approvals, Developer's coordination plan, the Developer's management approach, the construction management structure, identification of advanced Work, detailed delineation of work Project zones with identification of design and construction packages, and summary of major Project phases;



- h. Description of key processes and their reference location within the Developer's Operations Management Plan and Maintenance Management Plan, in accordance with the Schedule 11 requirements, including a description of how design personnel will interface with Developer's construction, Process Control, IQC and O&M organizations in accordance with the Schedule 8, Quality Management Plan requirements, process for inspections and notifications of issues of non-compliance to Department, and processes and timeframe for providing applicable cures for nonconformance;
- i. Detailed description of the interface between the design and construction resources and the allocation of design and construction staff to implement the Project;
- j. Process for addressing constructability, durability, maintainability and environmental compliance in the Work;
- k. Description of key processes and their reference location within the Developer's Durability, in accordance with the requirements in Schedule 8 and to meet the requirements of Schedule 12 Handback Requirements. This will include a description of how design personnel will interface with Developer's construction, Process Control, IQC and O&M organizations in accordance with the Quality Management Plan requirements in Schedule 8 to ensure durability in the design process;
- l. Description of key processes and their reference location within the Developer's Quality Management Systems Manual, in accordance with the Schedule 8 requirements, for control of the Release for Construction (RFC) drawings through the Construction Period including making changes to the design during construction and ensuring engineering review of the new design and compliance with the Project Agreement. Processes shall demonstrate how the Department and the Developer's design team are involved in the review and acceptance of deviations from the RFC drawings;
- m. Process for construction closeout including the Developer's approach to satisfaction of Milestone Completion Conditions, Substantial Completion Conditions, Final Acceptance Conditions, and management of Punch Lists;
- n. Description of key processes, and their reference location within the Developer's Safety Management Plan, in accordance with Schedule 8 requirements, for both employees of Developer and its Subcontractors and the public, including the designation of a full time safety manager, training procedures, description of the subcontractor Health and Safety Plan, accident investigation procedures and exposure assessment;
- o. Description of key processes, and their reference location within the Developer's Transportation Management Plan, in accordance with Section 2 of Schedule 10 Maintenance of Traffic requirements, including interface with the Department and the City of Denver (CCD);
- p. Description of key processes, and their reference location within the Developer's Strategic Communications Plan, in accordance with the Schedule 14 requirements, including interface with the Department, CCD, Governmental Authorities, regulatory agencies, Utility Owners, Railroads, other stakeholders and the public during the Work, at a minimum the following activities: plans and Permits review; progress, workshops, partnering and Utility coordination meetings; construction engineering and inspection; and public involvement and community input;
- q. Description of key processes, and their reference location within the Developer's Environmental Compliance Work Plan, in accordance with the Schedule 17 requirements, including interface with the Department and any Governmental Authority;
- r. Description of key processes, and their reference location within the Developer's Property Management Plan, in accordance with the Schedule 18 requirements, including processes for the security, hazardous materials assessment, demolition, debris removal, site clearing, storm water management improvements, and clean-up of building structures and property improvements acquired as part of the ROW for the Project;

- s. Description of key processes for managing the Project's Disadvantaged Business Enterprise (DBE), Emerging Small Business (ESB), and Workforce Development program, and their reference location within their respective Plans, in accordance with the Schedule 15 requirements;
- t. Description of the Developer's key processes and approach to the Schedule Work Plan, in accordance with the Schedule 8 requirements, including Schedule maintenance and required Deliverables management, and Supervening Event and Change management procedures; and
- u. Developer's approach to non-compliance reporting, evaluation, and resolution with each of its Subcontractors and methodology on how this information will be reported to the Department, including in accordance with the Schedule 6, Part 6 requirements.

## 6. QUALITY MANAGEMENT

### 6.1. General

- 6.1.1. The Developer shall be responsible for implementation and maintenance of an effective quality program to manage, control, document and assure all obligations of the Developer comply with the requirements of the Project Agreement. The Developer shall develop and submit a comprehensive Quality Management Plan (QMP) that is consistent with and expands upon the draft Stage 1 QMP and draft Stage 2 QMP submitted in the Proposal. The QMP shall document the Developer's commitment to quality, and all quality requirements of the Project Agreement. Processes and procedures established in the QMP shall ~~comply~~ be certified underwith International Organization for Standardization (ISO) 9001:2008, or equivalent ISO standard in effect on the date the QMP is submitted. The QMP shall encompass all Work performed by the Developer and Subcontractors of all tiers. The Developer shall obtain the Department's Approval of the QMP in two stages: Stage 1, Approval of all non-construction related procedures and plans; and Stage 2, Approval of all construction-related procedures and plans.
- 6.1.2. The QMP shall delineate how the Developer will ensure that all disciplines, aspects, and elements of the Work shall comply with the requirements of the Project Agreement.
- 6.1.3. The QMP shall cover temporary and permanent components of the Work.
- 6.1.4. The QMP shall include procedures and methods that define how the Developer will collaborate with the Department through the Department's quality assurance oversight program as described in Section 6.6 of this Schedule 8.
- 6.1.5. The QMP shall describe the Developer's quality policy, approach to Process Control (PC) and Independent Quality Control (IQC) relative to design, construction, and Work management, quality improvement, quality personnel, and training in the QMP. The QMP shall list procedures for meeting all requirements of the Project Agreement. The Developer shall submit the Stage 1 QMP for non-construction related Work to the Department for Approval prior to issuance of NTP1. The QMP for all remaining Work (Stage 2) on the Project must have the Department's Approval prior to the issuance of NTP2. Any subsequent addenda to the QMP, required during execution of the Work, shall require the Department's Approval prior to implementation.
- 6.1.6. The QMP may include a process to allow the commencement by the Developer of Restricted Activities (as defined in Schedule 9, Submittals) on an at risk basis. If included, such process shall require the Developer to document at a minimum the following:
  - a. Identification of the need to perform the Work constituted by the relevant Restricted Activities on an at risk basis;
  - b. Description of such Work, including discussions with the Department;
  - c. Description of Developer assessment of risk associated with proceeding with such Work on an at risk basis;

- d. Developer approval mechanism, above the Principal Subcontractor level, and including the IQCM;
  - e. Clear delineation of at risk construction plans, how and when they will be released; and
  - f. Verification process of acceptability of such Work once plans have formally been Released for Construction.
- 6.1.7. The Developer shall update and submit to the Department for Approval its QMP when its own quality management organization detects systemic or fundamental breaches of the Project Agreement or deficiencies in the manner the Work is inspected or tested, including breaches or deficiencies that have caused or that may cause Nonconforming Work to be performed, or when the Department advises the Developer of such a problem. The Developer shall also revise the QMP should any of the following conditions exist:
- a. QMP or procedure within the QMP no longer adequately addresses the matters it was originally intended to address;
  - b. QMP or procedure within the QMP does not conform with the Project Agreement;
  - c. An audit by the Developer or the Department identifies a deficiency in the QMP requiring an update;
  - d. Organizational structure changes require revision to the QMP;
  - e. The Developer is undertaking, or about to undertake, activities that are not covered within the current QMP; or
  - f. The Department requires the QMP to be updated at its request.

## **6.2. Administrative Requirements**

- 6.2.1. Quality Systems Procedures shall adhere to the following requirements:
- a. Be consistent with the requirements of this Section 6.2.1 of this Schedule 8 and Developer's stated quality policy.
  - b. Include all Work methods and the enforcement and implementation of these work methods through best practice. However, it is inevitable that situations will arise that require a departure from the norm. These conditions shall be anticipated in the procedures and shall allow for control of these activities.
  - c. Define the liaison and interface between the quality organization and the design and construction arms of the Developer.
  - d. The quality procedures shall, as a primary objective, be written with the intent of gaining employee understanding of the system.
  - e. Describe to the rationale for the procedures selected and, if the procedures do not address every provision of this Section 6.2.1 of Schedule 8, to explain why the standard is not applicable in their particular situation.
  - f. The following list of procedures (items i through xxi) shall serve as the starting point for defining Developer's quality management system:
    - i. Procedure for the preparation, control, and distribution of the Quality Management Plan;
    - ii. Scope;
    - iii. Key Personnel;
    - iv. Organizational/technical interfaces;
    - v. Design input requirements;
    - vi. Design output requirements (deliverables);

- vii. Design Reviews;
  - viii. Department participation;
  - ix. Levels of responsibility and authority;
  - x. Procedure to control, verify, and validate the design;
  - xi. Procedure for document issue, approval, and revision;
  - xii. Procedure for the identification of, and where required by Project Agreement, the traceability of, deliverable items, such as Release for Construction Documents and As-Builts;
  - xiii. Procedure for the verification and control of computer programs used in design;
  - xiv. Procedures for inspecting, testing, and calibrating equipment;
  - xv. Procedures for handling Nonconforming Work;
  - xvi. Procedures for environmental compliance;
  - xvii. Procedures for corrective/preventive actions;
  - xviii. Procedures for handling storing, packaging, tracking and submitting Deliverables;
  - xix. Training processes;
  - xx. Procedures for internal quality audits; and
  - xxi. Procedure for management review.
- g. The implementation of the quality system shall be demonstrated by internal quality audit reports, the trending of nonconformance, records of root-cause analysis, records of corrective and preventive actions, and records of Department audits and observations.
- h. Documented procedures may make reference to specifications that define how an activity is performed. Procedures shall describe the process steps of what needs to be done and work instructions shall prescribe how it is to be done.

#### 6.2.2. Quality Policy

- a. The Developer shall develop a written policy for quality, including objectives for, and its commitment to, quality. The Developer's executive management shall ensure that this policy is implemented at all levels of the Developer's organization.
- b. The Developer shall publish and post a statement of its commitment to quality and the organization's quality objectives in several locations throughout the Project Office and the Site. The statement shall explain the Developer's commitment to quality and the responsibility the Developer has for assuring that it meets the quality requirements included in this Schedule 8.
- c. The quality policy statement shall be made known to and understood by all Developer employees, sub-consultants, Subcontractors, and Suppliers. The Developer shall conduct and document a formal training program for all Developer employees, sub-consultants, Subcontractors, and Suppliers on the quality policy prior to their participation in activities monitored by the Developer under the QMP.
- d. The QMP shall include the Developer's executive management's quality policy. The QMP shall delineate the procedure used by the Developer's executive management to implement the Developer's quality policy.

#### 6.2.3. Quality Planning

- a. The Developer shall provide evidence of quality planning that ensures specific requirements of the Project Agreement have been identified and incorporated into the

documented quality system. Department's requirements represent the minimum requirements.

- b. The Developer shall perform IQC inspections during all phases of the Work from NTP1 until Final Acceptance to assure that the Work meets, and is being performed in accordance with, the Project Agreement.
- c. The Developer shall include in the QMP its planning methods to meet the requirements of the Project Agreement. The Developer shall include, at a minimum, the activities below in its quality planning efforts to meet the Project Agreement requirements for the Work:
  - i. Define and develop quality objectives for the Work;
  - ii. Identify the necessary processes, resources, and IQC personnel that are needed to assure that Developer obligations meet the requirements of the Project Agreement, including, but not limited to, design, construction, Environmental Compliance, Strategic Communications requirements, maintenance of traffic requirements, safety, Disadvantaged Business Enterprise (DBE), Emerging Small Business (ESB), Workforce Development, training, project management processes, and the QMP;
  - iii. Ensure the compatibility of design, construction, installation, public information, inspection, and testing procedures;
  - iv. Develop and maintain up to date procedures for PC, IQC, and quality improvement;
  - v. Identify and define all measurable Project Agreement requirements;
  - vi. Identify quality hold points for Developer IQC testing and inspection and to allow the Department the opportunity to perform its owner verification responsibilities;
  - vii. Identify, define, and implement standards of workmanship for all applicable work features (e.g., concrete finishing);
  - viii. Identify, define, prepare, and maintain quality records and quality plans for all elements of design, including, but not limited to, wet and dry utilities, architectural, civil, structural, geotechnical, survey, hydraulic, environmental, traffic, safety, Right-of-Way (ROW), and temporary Work;
  - ix. Develop a procedure for preparation, control, Approval, and distribution of the QMP;
  - x. Develop a procedure for IQC auditing to ensure the Developer, Subcontractors, and Suppliers of material understand and are effectively implementing the QMP;
  - xi. Develop a procedure for corrective and preventative actions regarding quality compliance and implement the quality improvement plan to address corrective Work;
  - xii. Develop a procedure and ensure the Developer's executive management reviews the QMP at planned intervals to ensure its continued suitability, adequacy and effectiveness. Such reviews should include PC/IQC results, owner verification results, status of corrective/preventive actions, follow-up items from previous management reviews, changes to the QMP, and recommendations for improvement;
  - xiii. A systemic process for ensuring quality regardless of production or scheduling needs.

#### 6.2.4. Process Control

- a. The Developer shall be responsible for establishing, documenting, and implementing, a PC program. The PC program shall be described in the QMP and shall include all procedures necessary for the Developer to control the quality of its production processes to meet the requirements of the Project Agreement. The Developer shall develop a testing and inspection schedule to control production processes. The Developer shall conduct examinations of the quality of workmanship to confirm that all Work is being performed in accordance with all Project Agreement requirements. Appropriate follow-up inspections, sampling, and testing of materials shall be performed as each item of Work progresses to assure consistency in workmanship, compliance with Project Agreement requirements, (including design and construction documents), and satisfactory performance of the Work in service.
- b. Construction PC materials testing activities shall utilize statistical analyses of material test results, including mean, variance, range, and running averages; measurements; clearances; and interactions between PC and IQC. The results of these activities shall be used by the Developer to set up control charts to monitor and track variations in materials over time. The control charts and the analytical results on which they are based shall be provided to the Department within 24 hours when requested.
- c. Tests or inspections performed by production or PC personnel as part of the PC process shall not be used to satisfy the IQC requirements.

6.2.5. Control of Inspection, Measuring, and Test Equipment

- a. Developer shall establish and maintain documented procedures to control, calibrate, and maintain inspection, measuring, and test equipment – including test software – used by Developer to demonstrate the conformance of product to the specified requirements. Inspection, measuring, and test equipment shall be used in a manner that ensures that the measurement uncertainty is known and is consistent with the required measurement capability.
- b. Developer shall ensure Quality Control is being performed by a group completely independent of the Developer's Project Manager. Independent Quality control (IQC) shall be an independent group employed by the Developer secure for the Project an independent Quality Control Firm (IQCF) which shall be an independent engineering/testing firm employed by the Developer responsible for administering and managing the construction IQC Inspection, sampling, and Testing. The IQCF and any Subcontractors or sub-consultants thereto must not have any responsibilities for scheduling or production activities~~be a Developer-Related Entity or any Affiliate thereof.~~
- c. The Developer shall establish, document and implement an IQC program. The Developer shall include in the QMP the methods and procedures by which the Work will be certified by the Developer as complying with the requirements of the Project Agreement.
- d. The IQC program shall be separate from the Developer's PC program.
- e. At a minimum, the IQCF testing shall include the observations, measurements, and documentation specified in the CDOT *Field Materials Manual* and its Frequency Guide Schedule for minimum materials sampling, testing, and inspection for all quality acceptance tests required. Items identified as pre-tested or pre-inspected by the Department shall remain the responsibility of Developer. The IQCF shall document the results and show if the test passed or failed based on the "pass/fail criteria" established in the Project Agreement. The IQCF shall include failing tests results in the test documentation.
- f. IQC personnel shall not participate in any PC activities and shall be independent of the PC personnel.
- g. The Developer shall identify in the QMP all necessary resources and personnel to perform all IQC activities required to ensure all Work meets the requirements of the Project Agreement. The QMP shall identify the construction quality hold points for IQC



testing and inspection and shall describe how the Developer will notify the Department so that it may have the opportunity to perform its owner verification responsibilities.

6.2.6. Quality Improvement

- a. The Developer shall establish, document, and implement a program for quality improvement. The Developer shall include in the QMP the methods for identifying, analyzing, evaluating, and implementing solutions to continuously improve quality. The QMP shall establish and maintain specific procedures to ensure a successful Quality Improvement Program.
- b. The Developer shall schedule and perform internal quality audits on the basis of the status and importance of the activity to be audited. The Developer shall conduct weekly quality meetings with affected Developer staff including construction specialty leads, and the Department to discuss open Nonconformance Notices (NCN)s/Nonconformance Reports (NCR)s and quality issues. All unresolved quality issues, including but not limited to NCRs and owner verification NCNs, shall be discussed at these meetings, until resolved. The Developer shall submit an updated Nonconforming Work log to the Department weekly and shall use the log to look for Nonconforming Work trends to determine if Corrective Actions are needed.
- c. The Developer shall ensure timely implementation of the necessary Corrective Actions to improve any nonconformance found during audits. The Developer's follow-up activities shall ensure the implementation and effectiveness of the Corrective Action taken. Corrective Actions shall identify the root causes of deficiencies and shall be developed, implemented, and tracked to prevent the recurrence of future nonconformance. Corrective Actions shall be monitored through review of documents, surveillance, or follow-up audits. The Developer shall keep records of Corrective Actions together with the respective audit records and submit those records to the Department upon request.
- d. The Developer shall consider the Department's verification audits and the overall project goals to determine where Developer quality improvement audits shall be performed and potential Corrective Actions to be implemented.

6.2.7. Quality Personnel

- a. The Developer's executive management shall have overall responsibility for success of the QMP. The Developer's executive management shall have the responsibility to ensure that personnel performing PC and IQC activities have the appropriate education, training, skills, and experience to meet the requirements of the Project Agreement. The Developer shall designate a Project Quality Manager (PQM) who shall not report to Developer's Project Manager, but shall be directly responsible to and report to the Developer's executive management. The PQM shall provide all final checks, approvals, and certifications for quality. The PQM shall be responsible for assuring, certifying, and providing documented evidence that the Work meets the requirements of the Project Agreement. The PQM shall have the authority and responsibility for the success of the Developer's quality program, and shall ensure that authority and responsibilities are defined and communicated within the organization.
- b. The PQM shall be the primary point of contact to the Department for all issues relating to Developer's Quality Management Plan, including preparation, review, implementation, and updates. The PQM, irrespective of other responsibilities, shall have defined authority and responsibility for the following:
  - i. Ensuring that a quality system is established, implemented, and maintained;
  - ii. Reporting quarterly on the performance of the quality system to Developer's executive management and the Department for review and as a basis for improvement of the quality system; and
  - iii. Direct supervision of the IDQM and IQCM and their respective staffs.

- c. The Developer shall assign an Independent Design Quality Manager (IDQM) that reports directly to the PQM and shall be responsible for all design quality control activities for the Work. The Developer shall identify a Design Process Control Manager (DPCM) for all design activities. The DPCM may be employed by the Lead Engineer and shall be responsible for all design PC activities. The IDQM shall not be involved with scheduling or production activities, and shall report directly to the PQM. The IDQM shall ensure that the methods and procedures contained in the Approved QMP, related to design, are implemented and followed by the Developer, subcontractors, fabricators, suppliers, and vendors in the performance of the Work.
- d. The Developer shall assign an on-site Construction PC Manager (CPCM) who shall be responsible for management of the PC aspect of the QMP. The CPCM shall not be involved with scheduling or production activities, and shall report directly to the Developer's management team. The CPCM shall ensure that the methods and procedures contained in the Approved QMP, related to construction, are implemented and followed by the Developer, subcontractors, fabricators, suppliers, and vendors both on-site and off-site in the performance of the Work.
- e. The Developer shall assign an on-Site Independent Quality Control Manager (IQCM) who shall be ~~an employee of the IQC~~independent of production and shall be responsible for management of the IQC aspect of the QMP. The IQCM shall report to the PQM and to the Department. The IQCM shall not report to any person or party directly responsible for design or construction production.
- f. The IQCM and CPCM shall both have or obtain the American Society for Quality (ASQ) certification as Quality Inspector, Quality Engineer, or Manager of Quality as an NTP2 Condition.
- g. The Developer's PQM, IQCM, IDQM, CPCM, and DPCM shall review and approve the QMP prior to submittal to the Department. The Developer shall assure, certify and provide documented evidence that the Work meets the requirements of the Project Agreement. At a minimum, the PQM shall report the status of the Work's quality monthly to the Department.
- h. All construction IQC testing personnel and PC testing personnel performing concrete and hot bituminous pavement process control tests shall meet the standards established in Section CP-10 of the CDOT *Field Materials Manual*.
- i. All construction IQC inspection personnel performing fabrication inspection of structural steel elements shall be qualified in accordance with Section 4.0 of the *CDOT Staff Bridge Fabrication Inspection Manual, Fabrication Inspection of Structural Steel Items for CDOT Roads and Bridge*.
- j. All construction IQC testing and inspection personnel performing inspections and tests for pre-stressed and precast concrete products shall be qualified in accordance with Section 3.0 of the *CDOT Staff Bridge Fabrication Inspection Manual, Fabrication Inspection of Pre-stressed and Precast Concrete Products*.
- k. The Developer shall ensure that personnel performing Work shall have the education, training, skills, and experience to meet the requirements of the Project Agreement. The Developer shall maintain appropriate personnel records that may be examined by the Department upon request.

#### 6.2.8. Training

- a. The Developer shall establish and maintain documented procedures for identifying training needs and requirements and shall provide training of all personnel performing activities affecting quality. Personnel performing specific assigned tasks affecting quality shall be trained in the specific plans, processes, and procedures as assigned in the QMP (e.g., Materials Testing and Inspection Plan (MTIP), Developer auditing procedures, etc.).

- b. The Developer shall provide training to all personnel that may interface with the Department's oversight efforts (audit process) to ensure they understand their roles and responsibilities for cooperating and responding to audits.

**COLORADO HIGH PERFORMANCE TRANSPORTATION ENTERPRISE**

- and -

**COLORADO BRIDGE ENTERPRISE**

- and -

[Name of Developer]

**PROJECT AGREEMENT FOR THE CENTRAL 70 PROJECT**

**CERTIFICATE OF QUALITY MANAGER**

I, [NAME OF QUALITY MANAGER], certify as follows:

1. I am the Quality Manager appointed by [NAME OF ~~INDEPENDENT QUALITY CONTROL FIRM~~ DEVELOPER] to manage the Construction Work.
2. To the best of my knowledge, information and belief, there are no outstanding non-conformances in the Construction Work performed to achieve [Milestone Completion of Milestone No. [ ] other than those identified on the Approved Milestone Completion Punch List attached to this certificate] [Substantial Completion other than those identified on the Approved Substantial Completion Punch List attached to this certificate] [Final Acceptance].

Signed

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[Name]

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[Date]





# Central 70 Project

Attachment I – Tracked Changes to Schedule 27

ATC 9.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

**Schedule 27**  
**Key Personnel<sup>1</sup>**

**Project Manager**

**Position Description:** Responsible for overall execution and administration of Developer's responsibilities for the Project, with authority to bind Developer on all matters delegable pursuant to Law and Developer's governing documents affecting Project execution and administration, including: (i) with respect to design, construction, commissioning, operations, and maintenance; and (ii) authority to suspend Work.

**Qualifications:** The Project Manager shall have demonstrated experience and expertise on a similar role in the delivery of projects similar in scope, value, nature, and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to the end of the Term.

**To be seconded to/employed by:** Developer

**Name:** *[To fill in prior to execution of this Agreement.]*

**Construction Manager**

**Position Description:** Responsible for ensuring that the Project is constructed in accordance with all requirements of this Agreement. Responsible for managing Construction Contractor's construction personnel, scheduling of the construction quality assurance personnel, and administering compliance with all Technical Requirements applicable to the Construction Work. The Construction Manager shall have the authority to suspend Construction Work.

**Qualifications:** The Construction Manager shall have a minimum of 15 years' experience in construction and management of construction on highway projects similar in scope, value, nature, and complexity to the Project, with an emphasis on design-build experience and experience with interstate highways and interstate bridges.

**Minimum Period of Availability:** From Agreement Date to Final Acceptance.

**To be seconded to/employed by:** Construction Contractor

**Name:** *[To fill in prior to execution of this Agreement.]*

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<sup>1</sup> Schedule to be completed prior to execution with the identities of the approved Key Personnel as described in the ITP.



**Design-Build Manager**

**Position Description:** Responsible for the overall design and construction of the Project and for managing Developer's design-build team. The Design-Build Manager shall: (i) ensure that the Project is designed and constructed in accordance with the Technical Requirements; and (ii) have authority to suspend Construction Work.

**Qualifications:** The Design-Build Manager shall have a minimum of 20 years' experience, including a minimum of 15 years' design-build experience, in construction and management of design and construction on highway projects that included work of a similar scope, value, nature, and complexity as included in the Project.

**Minimum Period of Availability:** From Agreement Date to Final Acceptance.

**To be seconded to/employed by:** Construction Contractor

**Name:** *[To fill in prior to execution of this Agreement.]*

**Design Manager**

**Position Description:** Responsible for: (i) ensuring that the overall Project design is completed and design criteria requirements are met; (ii) managing the design team's personnel; and (iii) administering all design requirements in this Agreement. The Design Manager shall have authority to suspend design Work.

**Qualifications:** The Design Manager shall be a professional engineer licensed in the State no later than the date of issuance of NTP1. The Design Manager shall have a minimum of 15 years' experience in managing design for multidisciplinary highway projects with similar scope, value, nature, and complexity to the Project, with emphasis on design-build experience and experience with interstate highway, interstate bridges, and projects of similar scope, value, nature, and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to Final Acceptance.

**To be seconded to/employed by:** Principal Design Work Subcontractor to the Construction Contractor

**Name:** *[To fill in prior to execution of this Agreement.]*

**O&M Manager**

**Position Description:** Responsible for ensuring that all O&M Work and (at Developer's election) Renewal Work requirements of this Agreement are met.

**Qualifications:** The O&M Manager shall have demonstrated experience and expertise in a similar role on managing the operations, maintenance and (at Developer's election) rehabilitation work on highway projects of similar scope, value, nature, and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to the end of the Term.

**To be seconded to/employed by:** O&M Contractor

**Name:** *[To fill in prior to execution of this Agreement.]*

**Project Quality Manager**

**Position Description:** Responsible for overall quality management of the Project. The Project Quality Manager shall have the authority to suspend Work and shall provide monthly certification that Work is being performed in compliance with Law and the Project design.

**Qualifications:** The Project Quality Manager shall be a professional engineer licensed in the State no later than the date of issuance of NTP1, and shall have a minimum of eight years' experience in infrastructure transportation project design and construction, including at least five years' experience in quality assurance activities, including the preparation and implementation of quality plans and procedures for design, construction, and operations on transportation projects that included work of a similar scope, value, nature, and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to the end of the Term.

**To be seconded to/employed by:** The Project Quality Manager shall be employed by the ~~Independent Quality Control Firm~~ Developer. The Project Quality Manager can hold only this Key Personnel position.

**Name:** *[To fill in prior to execution of this Agreement.]*

**Independent Design Quality Manager**

**Position Description:** Responsible for ensuring quality management on all Design Work carried out on the Project, the Independent Design Quality Manager shall have the authority to suspend Work.

**Qualifications:** The Independent Design Quality Manager shall be a professional engineer licensed in the State no later than the date of issuance of NTP1, and shall have a minimum of eight years' experience in highway design, including at least five years' experience in quality assurance activities, including the preparation and implementation of quality plans and procedures for design on highway projects that included work of a similar scope, value, nature, and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to Final Acceptance.

**To be seconded to/employed by:** The Independent Design Quality Manager shall be employed by the ~~Independent Quality Control Firm~~ Principal Design Work Subcontractor to the Construction Contractor.

**Name:** *[To fill in prior to execution of this Agreement.]*

**Construction Process Control Manager**

**Position Description:** Responsible for ensuring all methods and procedures contained in the approved Stage 2 QMP are carried out on the Project, the Construction Process Control Manager shall have authority to suspend Work.

**Qualifications:** The Construction Process Control Manager shall be a professional engineer licensed in the State or possess a National Institute for Certification of Engineering Technologies (NICET) Level III Certificate in Highway Materials or Construction Materials with the soil, concrete, and asphalt sub-fields, as well as have or obtain the American Society for Quality (ASQ) certification as a quality inspector, quality engineer, or manager of quality, in each case prior to the date of issuance of NTP2. The Construction Process Control Manager shall have a minimum of eight years' highway construction experience on projects that included work of a similar scope, value, nature, and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to the end of the Term.

**To be seconded to/employed by:** Construction Contractor

**Name:** *[To fill in prior to execution of this Agreement.]*

**Independent Quality Control Manager**

**Position Description:** Responsible for managing all independent Quality Control aspects contained in the approved Stage 2 QMP that are carried out on the Project, including having authority to suspend Work.

**Qualifications:** The Independent Quality Control Manager shall be a professional engineer licensed in the State no later than the date of issuance of NTP1, and shall have a minimum of eight years' experience in transportation construction on projects that included work of a similar scope, value, nature, and complexity to the Project, five years of which shall be experience in developing and implementing similar quality control programs on transportation projects. The Independent Quality Control Manager shall have or obtain the American Society for Quality (ASQ) certification as a quality inspector, quality engineer, or manager of quality prior to the date of issuance of NTP2.

**Minimum Period of Availability:** From Agreement Date to the end of the Term.

**To be seconded to/employed by:** The Independent Quality Control Manager shall be employed by the ~~Independent Quality Control Firm~~ Developer.

**Name:** [To fill in prior to execution of this Agreement.]

**Environmental Manager**

**Position Description:** The Environmental Manager is responsible for ensuring compliance with all Environmental Requirements and commitments. The Environmental Manager shall have authority to suspend Work.

**Qualifications:** The Environmental Manager shall have a minimum of seven years' progressive experience working on projects of similar scope, value, nature, and complexity to the Project. The Environmental Manager shall also demonstrate the ability to work effectively with both design and construction staff.

**Minimum Period of Availability:** From Agreement Date to the second anniversary of Final Acceptance.

**To be seconded to/employed by:** Developer

**Name:** [To fill in prior to execution of this Agreement.]

**Utilities Manager**

**Position Description:** Responsible for managing all required Utility Work and coordinating the same with Utility Owners.

**Qualifications:** The Utilities Manager is a management role with a minimum of five years' relevant experience on major infrastructure projects of similar scope, value, nature and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to Final Acceptance.

**To be seconded to/employed by:** Construction Contractor

**Name:** *[To fill in prior to execution of this Agreement.]*

**Project Communications Manager**

**Position Description:** Responsible for overseeing all Developer communications efforts during construction, operations, and maintenance.

**Qualifications:** The Project Communications Manager shall have: (i) a minimum of seven years' professional experience working on design-build construction projects and a practical understanding of construction schedules, MOT plans, and work performance processes; (ii) experience with, and understanding of, complexities and importance of maintaining good relationships between the Project and government, businesses, residents, the general public, and other stakeholders; and (iii) experience with implementing communication and public involvement plans on projects of similar scope, value, nature, and complexity to the Project.

**Minimum Period of Availability:** From Agreement Date to the end of the Term.

**To be seconded to/employed by:** Developer

**Name:** *[To fill in prior to execution of this Agreement.]*



DATE: September 12, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 11.2

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 11.2 has been reviewed by the Procuring Authorities.

Detailed ATC 11.2 proposes to reroute the alignment of the 48 in. sanitary sewer line and eliminate the sanitary sewer bridge shown in the PA.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. As set forth in the Project Agreement, the Developer shall:
  - a. be responsible for any additional Environmental Approvals required for the ATC
  - b. be responsible to obtain any Additional Right-of-Way required for the ATC
  - c. be responsible to obtain any required Railroad Permits required for the ATC
- 2. The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



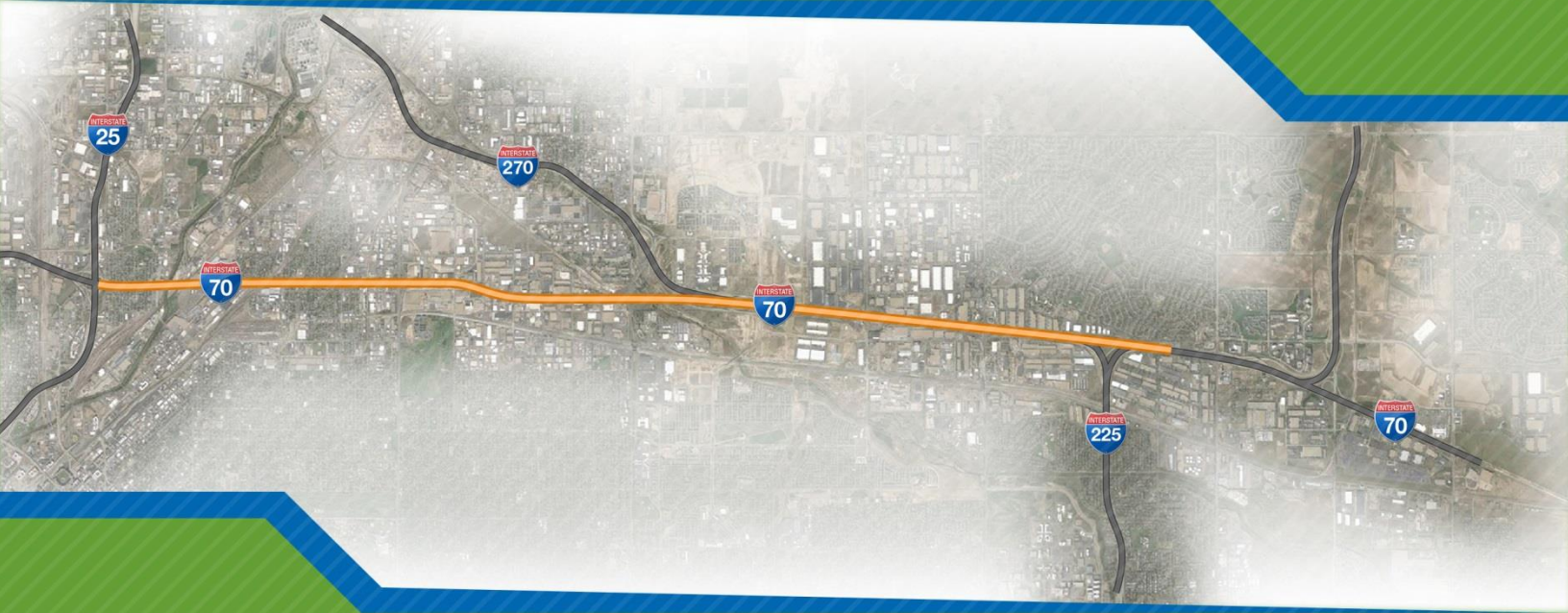




# Central 70 Project

Alternative Technical Concept Submission

ATC 11.2



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** August 16, 2016

**Central 70 Project RFP: ATC Submission No. 11.2**

**Sanitary Sewer Realignment**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

*KMP is resubmitting the Detailed ATC to address the items requested on the conditional approval; re-submission required, of Detailed ATC 11.1.*

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended from the previous submission of the ATC to eliminate the reference to other ATCs.

Kiewit-Meridiam Partners (KMP) is proposing to raise the profile of I-70 mainline (ML) by rerouting the alignment of the 48 in. sanitary sewer line and eliminating the Sanitary Sewer Bridge shown in the Project Agreement (PA). The invert of the Sanitary Sewer Bridge is ten ft. below the bottom of the York St. Bridge and is the vertical constraint controlling the I-70 profile. In an effort to raise the profile to minimize impacts associated with groundwater, KMP has developed a solution to reduce the size of the 48 in. sanitary sewer line and reroute its alignment. This allows the low point of the I-70 mainline profile to be raised by approximately six ft. KMP's proposed alignment is shown on **Attachment A**.

#### 2. Relevant RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC to clarify the relevant RFP Requirements.

### ATC 11.2 Benefits

- ✓ Lower initial capital and future maintenance costs
- ✓ Equal or better performance and reliability
- ✓ Optimize Scope
- ✓ Optimize Operations and life cycle maintenance costs
- ✓ Enhances community values and project benefits



Section 10.10.13.01 of Schedule 10B of the Project Agreement (PA) shows a Sanitary Sewer Bridge over the I-70 ML Lowered Section. This ATC will eliminate that proposed utility bridge.

### 3. Rationale

This information has been amended since the last submission of this ATC to revise the size from a 21 in. diameter line to a 30 in. diameter line as requested in the Procuring Authorities' response to ATC 11.1.

Eliminating the Sanitary Sewer Bridge will allow KMP to raise the profile of I-70 and minimize impacts associated with groundwater. To eliminate the Sanitary Sewer Bridge, KMP will reduce the size of the sanitary sewer line and reroute the alignment to the west and ultimately connect to Metro Wastewater Reclamation District's (MWRD) Delgany Interceptor. Through in-depth analysis KMP has proven that the proposed ATC is not only feasible but a preferable solution for the Department and Denver Wastewater Management (DWWM).

KMP's proposed alignment parallels the Proposed Offsite Drainage concrete box culvert (CBC) on the north side of the Purina facility. To ensure adequate space for the CBC and the sanitary sewer line, KMP had reduced the size of the sanitary sewer line from a 48 in. diameter to less than the 30 in. diameter required by the Procuring Authorities ATC response, but it has now been re-designed to meet that size criteria. In the March 31, 2016 One-On-One Meeting, DWWM indicated that the forecasted flow for the sanitary sewer line is 5.6 cfs. KMP's proposed 30 in. sanitary sewer line will yield a full flow capacity of 25.9 cfs. This will provide DWWM with over 400% of their forecasted capacity while still maintaining over 2 fps velocity at the current minimum measured flow of 0.49 CFS.

As shown on **Attachment A**, the proposed alignment will intercept the 48 in. diameter sanitary sewer line in York St. south of 46<sup>th</sup> Ave. and proceed west as a 30in. diameter line. The alignment will continue west on the north side of the Purina facility and will cross under the UPRR's tracks in a bored 42 in. diameter steel casing. The line will then continue west and cross under Brighton Blvd. in a bored 42 in. diameter steel casing. On the west side of Brighton Blvd., the sanitary sewer line will be open cut across 44<sup>th</sup> St. and proceed west under McFarland Dr. The line will then turn north and follow the National Western Complex's (NWC) proposed roadway (**Attachment C**) and, ultimately, connect to the existing 78 in. MWRD Delgany Interceptor sanitary sewer line as shown in **Attachment D**.

The north side of I-70 will continue to be serviced by the existing 48 in. brick sanitary sewer pipe. This pipe has adequate capacity to meet existing needs, with significant reserve capacity to accommodate the needs of future development. The existing sanitary sewer lines in 46<sup>th</sup> Ave. on the south side of I-70 between York and Colorado Blvd. will be relocated into KMP's proposed alignment at a manhole in the intersection of York St. and 46<sup>th</sup> Ave. South as shown on **Attachment A**.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** By eliminating the Sanitary Sewer Bridge over I-70 Mainline, routine maintenance of the bridge will not be required over live traffic, which eliminates the inherent dangers to the public and maintenance workers.
- **Optimize the Scope:** Raising the I-70 profile decreases the volume of excavation, retaining wall area, and eliminates a new utility structure. Additionally, construction dewatering will be

significantly decreased by raising the profile. The optimization of scope is accomplished while maintaining equal or better performance of the sanitary sewer line.

- **Optimize Operating and Life Cycle Maintenance Costs:** Through elimination of the Sanitary Sewer Bridge, this ATC facilitates raising the I-70 profile which will decrease groundwater impacts and lower long-term permanent dewatering costs. Additionally, it will remove all maintenance costs associated with the PA required Sanitary Sewer Bridge.

## 4. Impacts

This information *has not been* amended since the last submission of this ATC to show additional ROW easements required and include additional positive impacts to the Project.

This ATC does not present any significant adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. KMP analysis has concluded that there will be minimal upstream impacts associated with tying into the MWRD Delgany Interceptor. This has been confirmed in discussions with the MWRD at the One-on-One meeting. Temporary by-pass pumping may be required during construction, however the flow rates provided by DWW in the RFP Reference Documents can be handled using standard construction by-pass pumping methods. The Offsite Drainage CBC still fits within the current drainage utility easement (PE-25) at the northwest corner of the Purina property as shown in **Attachment B**. Additional new utility easements from the City and County of Denver and the National Western may be required.

This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** This ATC will minimize the environmental concerns associated with handling, disposal, and treatment of groundwater through the construction and operations and maintenance period.
- **Neighborhood Impacts:** Eliminating the Sanitary Sewer Bridge will result in a more aesthetically pleasing configuration.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the last submission of this ATC to further elaborate on the estimate cost savings to the Project.

This ATC eliminates the Sanitary Sewer Bridge while decreasing wall and excavation quantities. The proposed alignment does add elements to the scope of the sanitary sewer line; however, these are offset by the reduction in the treatment and disposal of groundwater during the construction and maintenance terms.

**Initial cost analysis indicates an overall savings to the Project of approximately \$10 million.**

## 6. Schedule Analysis

This information *has not been* amended since the last submission of this ATC to further elaborate on the schedule benefits to the Project.

This ATC does not significantly affect the critical path of the anticipated construction schedule. Utility relocation will be completed prior to movements of ML traffic for both the PA Concept and this ATC. By implementing this ATC and raising the I-70 profile, KMP is able to reduce the

excavation, reduce the retaining wall quantities, and potentially change the type of retaining walls which will have a positive impact on localized construction durations.

## 7. Conceptual Drawings

This information has been amended since the last submission of this ATC. Attachments A, D, and E have been updated to address to the Procuring Authorities' comments on ATC 11.1.

**Attachment A:** Plan and profile of the 30-in. SS realignment

**Attachment B:** PA required easement in the NW corner of the Purina property (PE-25)

**Attachment C:** Plan view of the re-alignment west of the Coliseum

**Attachment D:** Plan and profile of the connection to the Delgany Interceptor

**Attachment E:** Cross-Sections of the proposed sanitary sewer realignment in relation to the proposed storm sewer CBC north of the Purina facility.

**Attachment F:** Tracked changes for the changes proposed to the Contract Drawings in Schedule 10B

## 8. Past Use

This information *has not been* amended since the last submission of this ATC.

The conventional industry practice is to implement sanitary sewer bridges over interstate traffic only as a last resort. This is due to poor aesthetics, increased maintenance and access issues, potential for leakage, and other complexities associated with sanitary sewer bridges. This ATC will provide a more conventional solution for the sanitary sewer line.

## 9. Additional Information

This information has been amended since the last submission of this ATC to address the Procuring Authorities comments provided in the response to Detailed ATC No. 11.1.

### ATC No. 11.0 Comment #1

*Each ATC must be able to stand on its own merits and shall not be contingent upon approval of other ATC's. Please remove references to the other ATC's in the Detailed ATC submission and, if necessary, make any modifications that would be necessary to implement the ATC on the assumption that ATCs 10 and/or 12 are not approved.*

**KMP Response:** References to other ATC's have been removed

### ATC No. 11.0 Comment #2

*Per section 12.1.a of the Project Agreement, the Developer is required to coordinate with the City of Denver regarding the list of Denver Planned Projects shown in Appendix B to Section 9 to Schedule 10. Please provide information on how this ATC would interact with the National Western Master Plan Improvements project.*

**KMP Response:** Attachment C has been provided to display the proposed alignment of the 30 in. sanitary sewer line within the NWC's proposed improvements as shown on the current NWC Master Plan. The flexibility of this alignment allows adjustments to be made prior to construction to accommodate final locations of proposed streets, or other improvements, as plans for the NWC develop further.

## **ATC No. 11.0 Comment #3**

*Provide information on the plans for the existing sanitary sewer on the south side of I-70 from York St. to Colorado Blvd. Will the flows be diverted to connect to the proposed relocation put forth in ATC No. 11.0?*

**KMP Response:** The proposed sanitary sewer line in 46<sup>th</sup> Ave. South will be connected to this relocated York St. sanitary sewer line in the vicinity of the 46<sup>th</sup> Ave. South and York St. intersection as shown on **Attachment A**.

## **ATC No. 11.0 Comment #4**

*Provide information on number and type of potential Additional ROW Parcels.*

**KMP Response:** **Attachment B** shows the current utility easement (PE-25) on the NW corner of the Purina property and the location of the PA Offsite Drainage CBC and the proposed sanitary sewer within that easement. **Attachment C** shows the additional new utility easements that may be required from the City and County of Denver and the National Western.

## **ATC No. 11.1 Comment #1**

*Provide cross sections (including existing and proposed infrastructure) for the length of the proposed sanitary sewer realignment.*

**KMP Response:** Please reference **Attachment E** for cross-sections along the length of the proposed sanitary sewer realignment.

## **ATC No. 11.1 Comment #2**

*Update plan and profile to show existing and proposed infrastructure (i.e., the Stock Show underpass).*

**KMP Response:** The existing and proposed infrastructure, including the Stock Show underpass, has been included on **Attachment A**.

## **ATC No. 11.1 Comment #3**

*Per the CCD Sanitary Sewer Design Technical Criteria Manual, manholes are not allowed in detention ponds. Please revise submittal to reflect this requirement.*

**KMP Response:** The sanitary sewer alignment has been revised to locate manholes outside of the detention ponds as shown on **Attachment A**. KMP acknowledges that modifications may be made to detention ponds during final design and will revise the sanitary alignment as required to ensure manholes are not located within detention ponds.

## **ATC No. 11.1 Comment #4**

*In order to not rely on alignments proposed in other ATCs, show how existing RFP storm outfall would impact the proposed alignment.*

**KMP Response:** The sanitary sewer alignment has been shifted to the north side of the box culvert, adjacent to the coliseum in this area, as shown on sheets 1 and 2 of **Attachment A**.

## **ATC No. 11.1 Comment #5**

*Because of the difficulty maintaining this facility in the future, revise profile for a slope range of 0.08% to 1.3% and provide a minimum pipe size of 30”.*



**KMP Response:** The pipe slope is currently designed at a 0.4% slope which exceeds the 0.08% minimum. This will provide flow velocities of 2 fps, which meets the DWWM criteria, for the current minimum measured flow of 0.49 cfs. Please reference **Attachment A** for a plan and profile of the proposed sanitary sewer.

## C. Detailed ATC Requirements

### 1. Risks

This information *has not been* amended since the last submission of this ATC.

There are no changes or additional risks to the Procuring Authorities, CDOT, the State, or third parties associated with implementation of the ATC. This ATC minimize risks to the Project through the elimination of the Sanitary Sewer Bridge over I-70 mainline.

### 2. Handback

This information *has not been* amended since the last submission of this ATC.

There are no changes in Handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

This information *has not been* amended since the last submission of this ATC.

The Offsite Drainage CBC, and the sanitary sewer line, fit within the current drainage utility easement (PE-25) at the northwest corner of the Purina property as shown in **Attachment B**. Additional new utility easements from the City and County of Denver and the National Western may be required as shown in **Attachment C**. The additional easements are anticipated to be acquired prior to construction with no impact to the Project.

### 4. List of Required Approvals

This information *has not been* amended since the last submission of this ATC.

This ATC will require approval by DWWM and MWRD. Initial meetings with DWWM indicate that the proposed ATC is a preferable solution for DWWM. UPRR approval will be required to bore the sanitary sewer line below their existing tracks. However, the PA already requires work in the vicinity beneath the UPRR's existing tracks.

### 5. Proposed Drafting Revisions

This information *has not been* amended since the last submission of this ATC.

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests the following sections be revised for the exclusive use by KMP upon acceptance of this ATC.

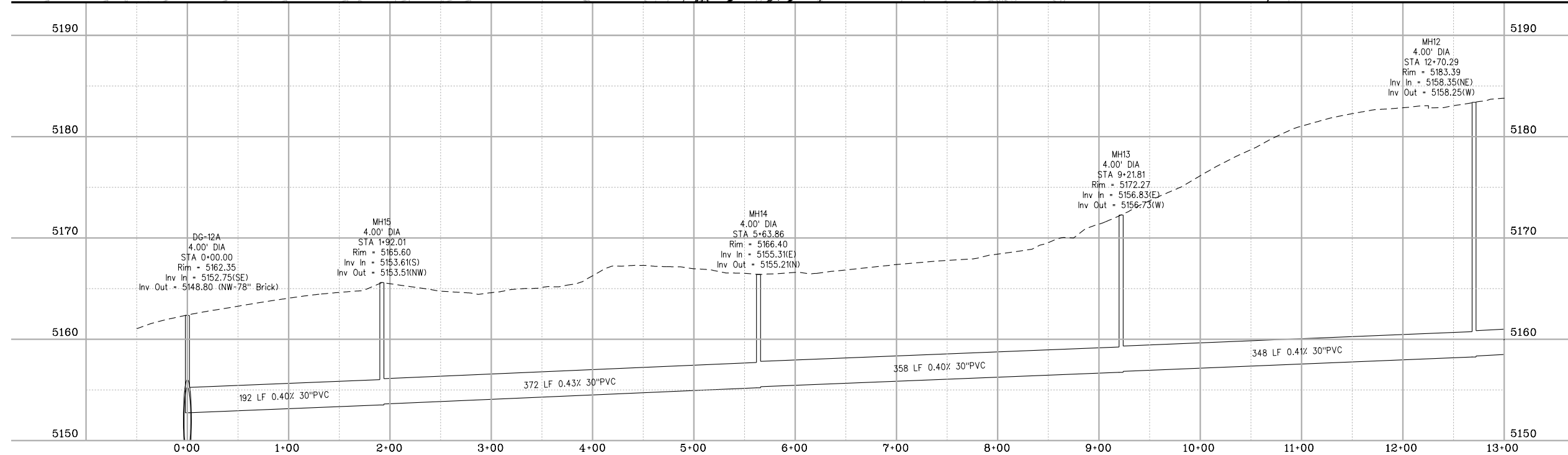
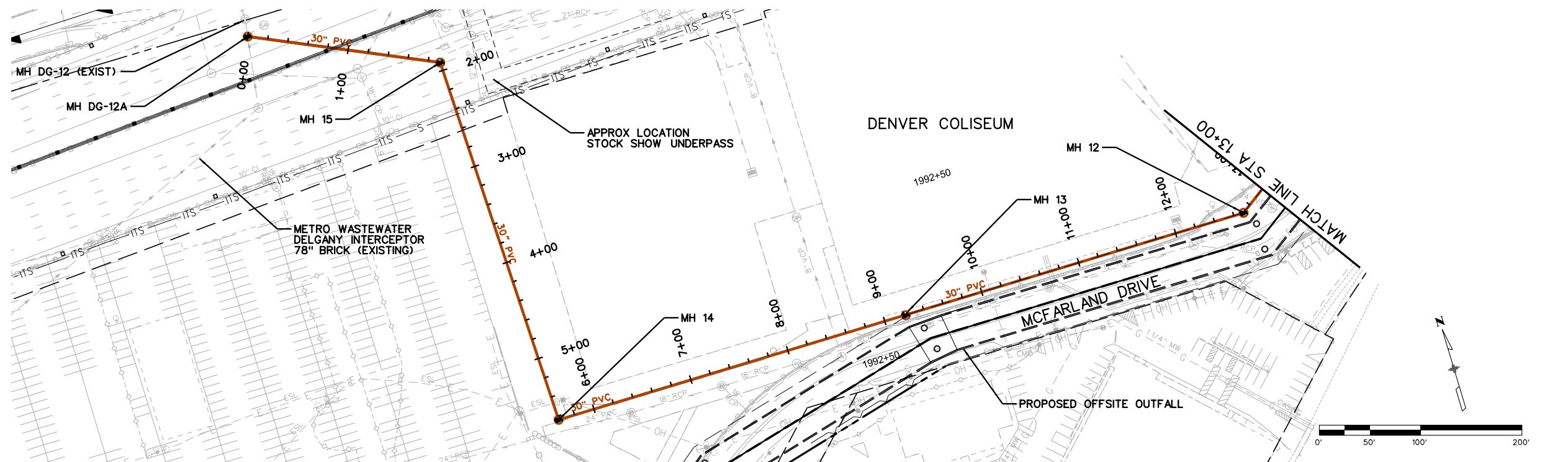
- Schedule 10B (Contract Drawings) of the Project Agreement
  1. Section 10B.10.13.01

The elimination of the requirement for a Sanitary Sewer Bridge over I-70 Mainline.

#### b) Proposed Revisions to address Inconsistencies

KMP has included the following attachments with tracked changes for the changes in the sections listed above.

- Section 10B.10.13.01 of Schedule 10B (Contract Drawings) of the Project Agreement **Structure Typical Sections** as shown in **Attachment F**.



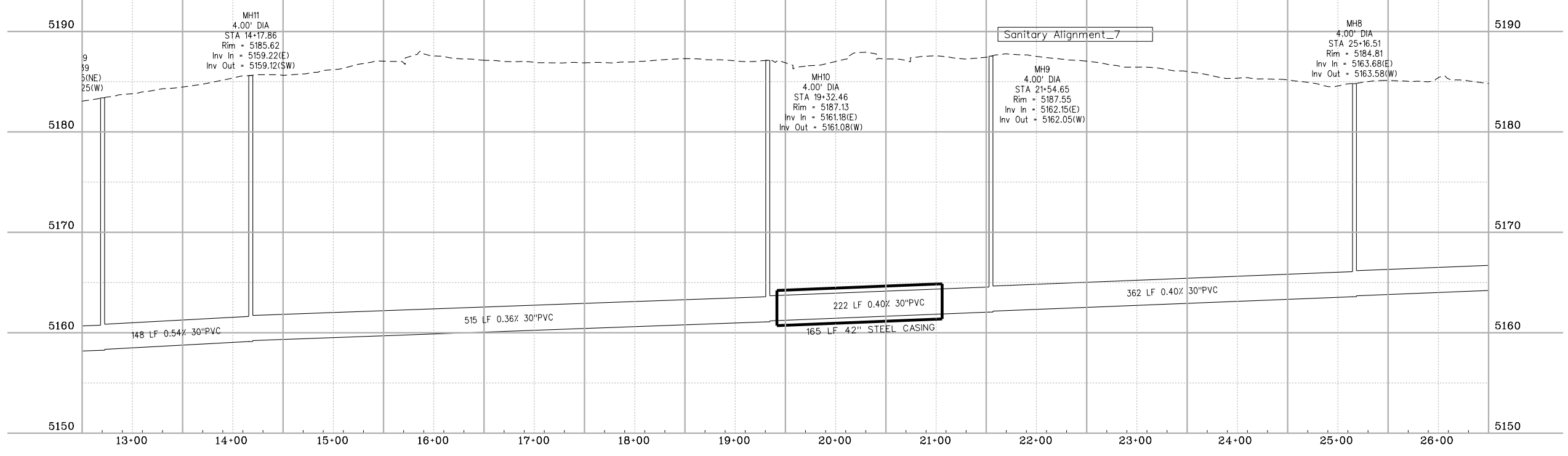
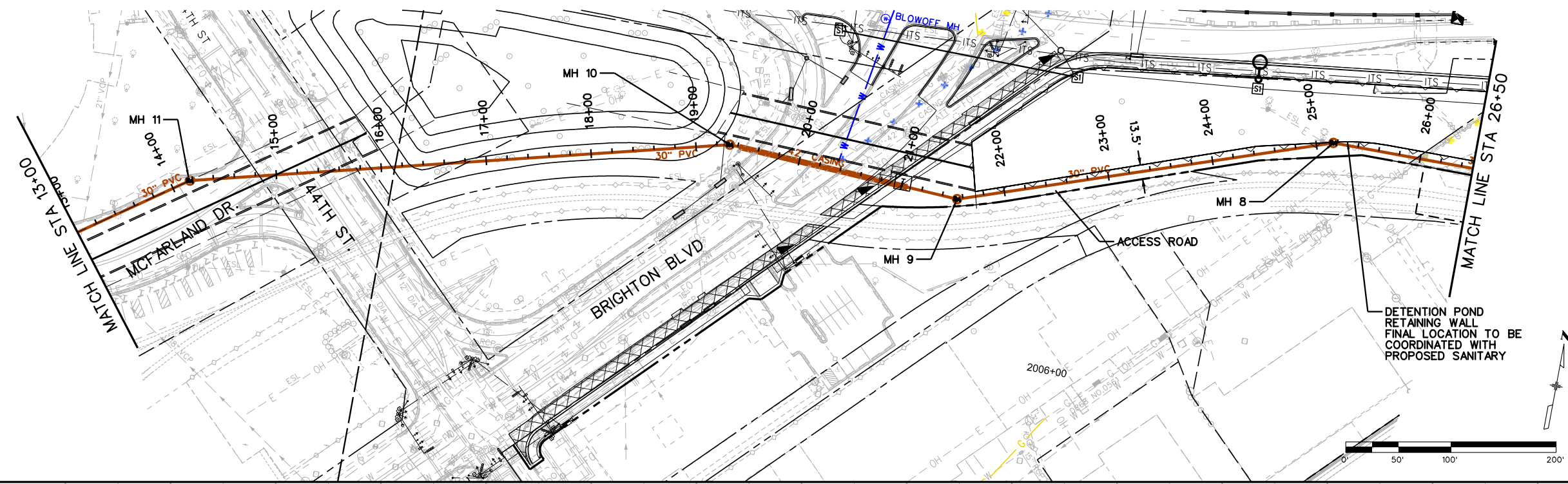
REFERENCE	SECTION	PAGE
B.1	OVERVIEW	1
B.3	RATIONALE	2
B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	4
B.9	ADDITIONAL INFO	5

ALTERNATIVE TECHNICAL CONCEPT  
**SANITARY SEWER REALIGNMENT**

ATTACHMENT A

ATC NUMBER  
**11.2**

SHEET NUMBER 1 OF 4



REFERENCE	SECTION	PAGE
B.1	OVERVIEW	1
B.3	RATIONALE	2
B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	4
B.9	ADDITIONAL INFO	5

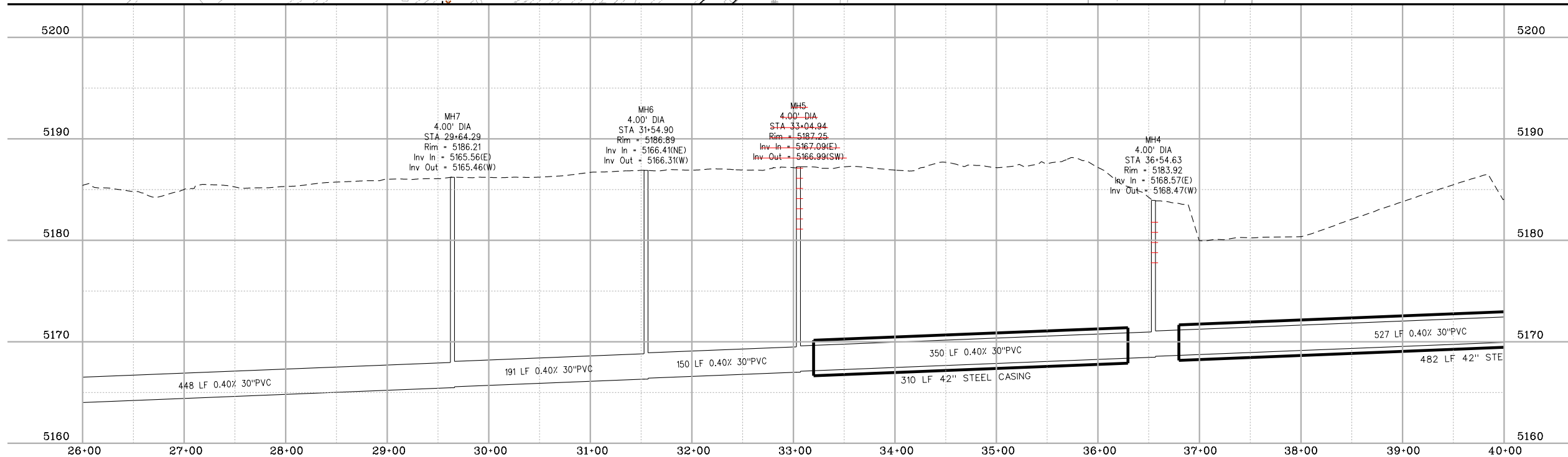
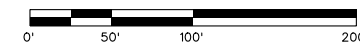
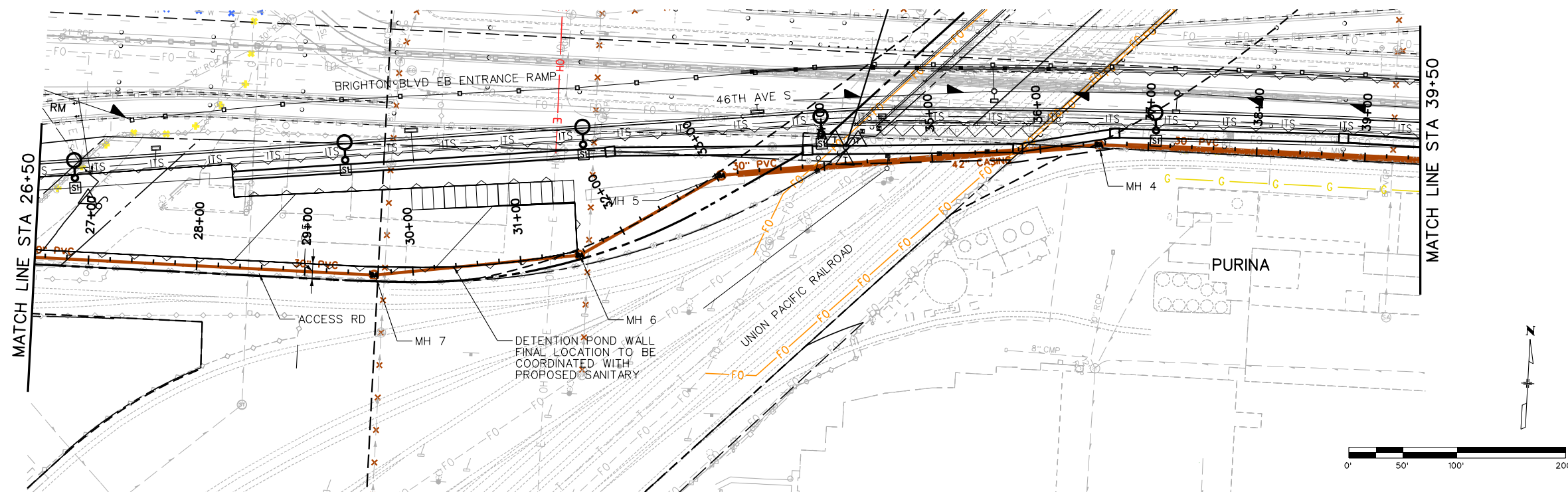
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**SANITARY SEWER REALIGNMENT**

ATTACHMENT A

ATC NUMBER  
**11.2**

SHEET NUMBER 2 OF 4





REFERENCE	SECTION	PAGE
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B.3	RATIONALE	2
B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	4
B.9	ADDITIONAL INFO	5

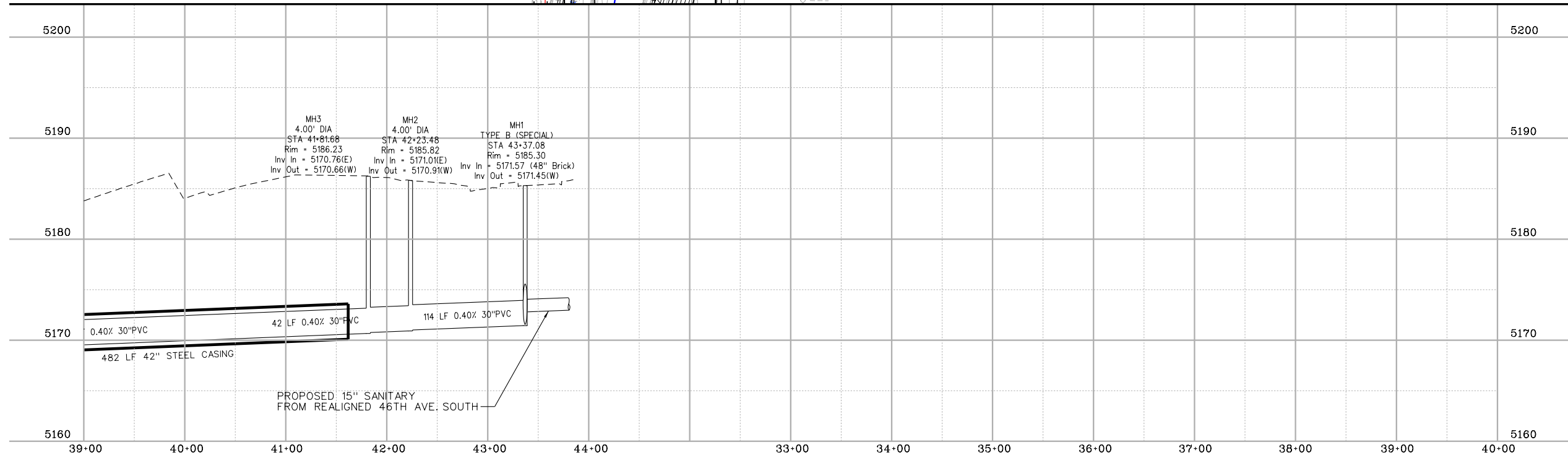
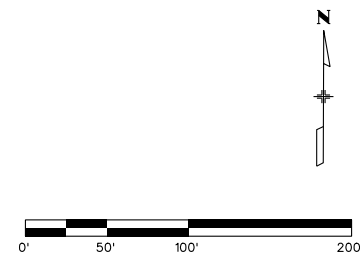
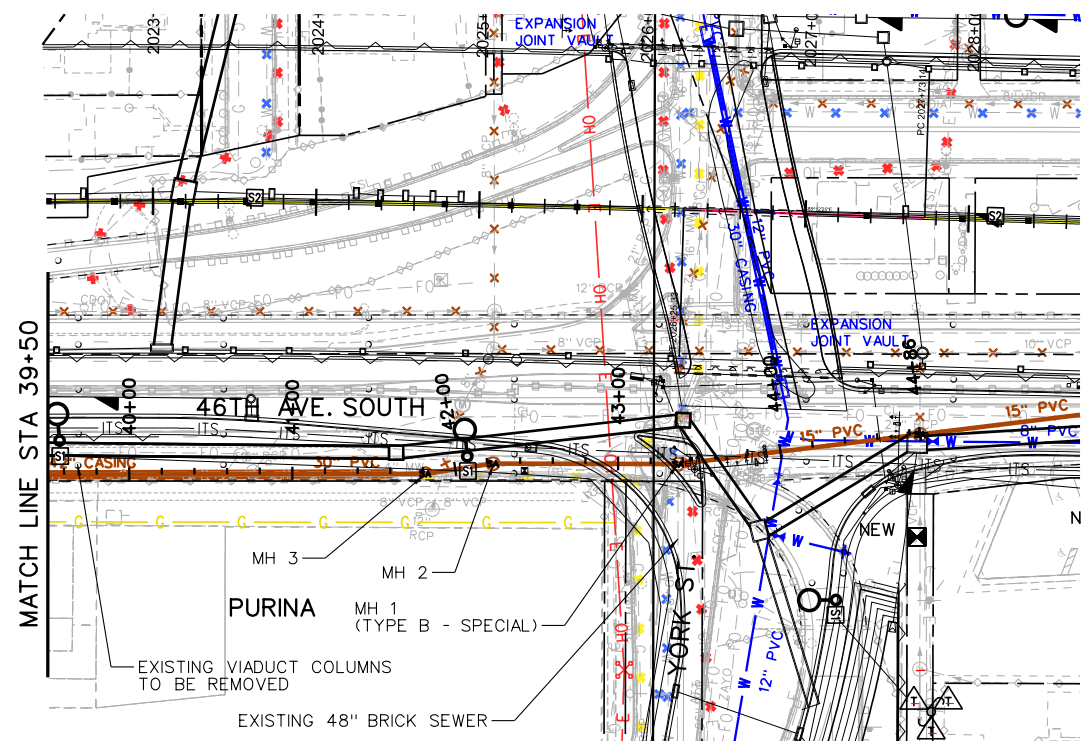
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**SANITARY SEWER REALIGNMENT**

ATTACHMENT A

ATC NUMBER  
**11.2**

SHEET NUMBER 3 OF 4





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B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	4
B.9	ADDITIONAL INFO	5

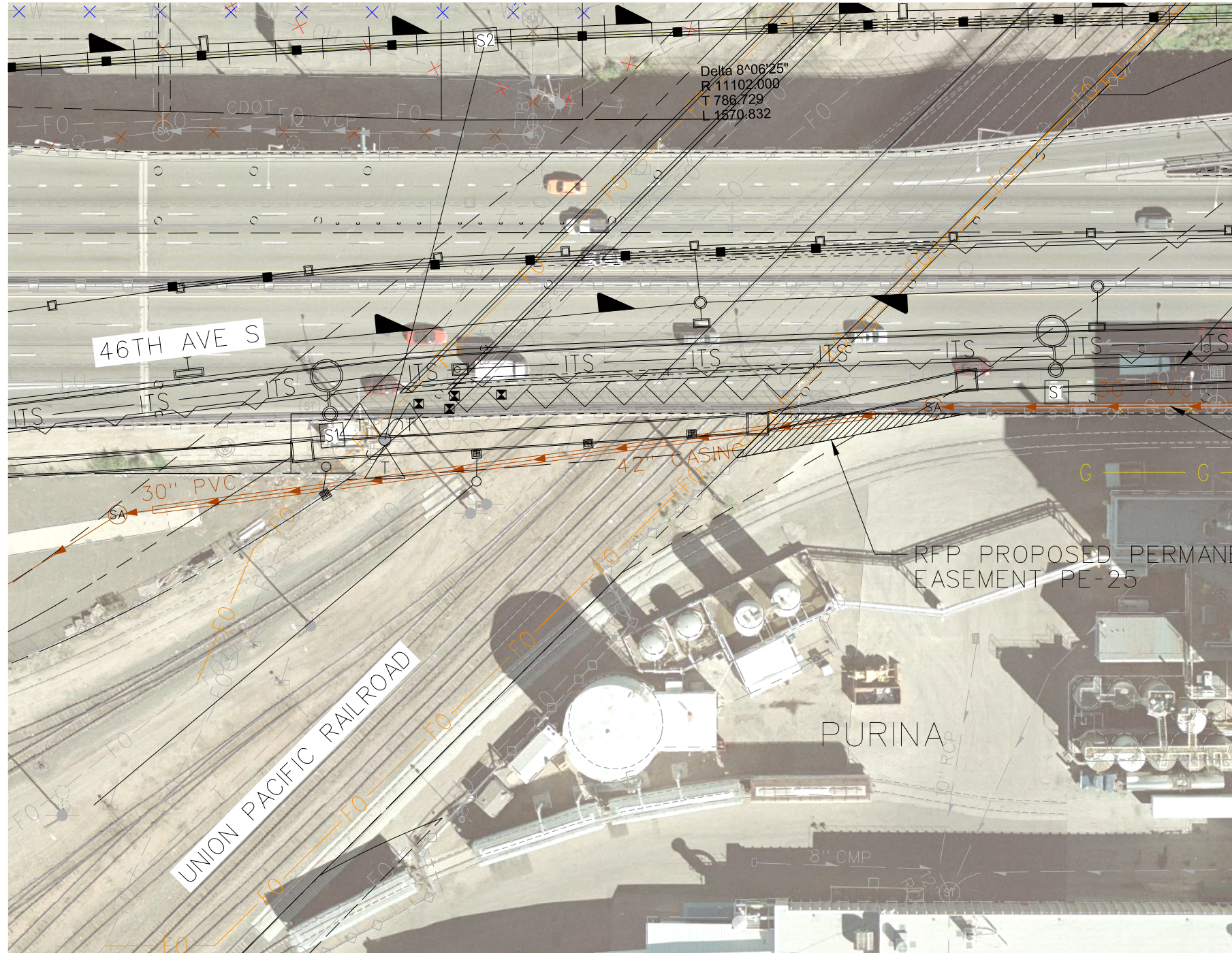
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**SANITARY SEWER REALIGNMENT**

ATTACHMENT A

ATC NUMBER  
**11.2**

SHEET NUMBER 4 OF 4





PROPOSED OFFSITE  
OUTFALL  
7X6 RCBC

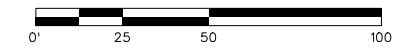
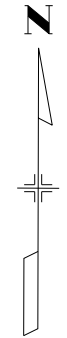
PROPOSED 30" SANITARY  
IN 42" CASING

RFP PROPOSED PERMANENT  
EASEMENT PE-25

PURINA

46TH AVE S

UNION PACIFIC RAILROAD



REFERENCE	SECTION	PAGE
B.4	IMPACTS	3
B.7	CONCEPTUAL DWGS	4
B.9	ADDITIONAL INFO	5
C.3	RIGHT-OF-WAY	6

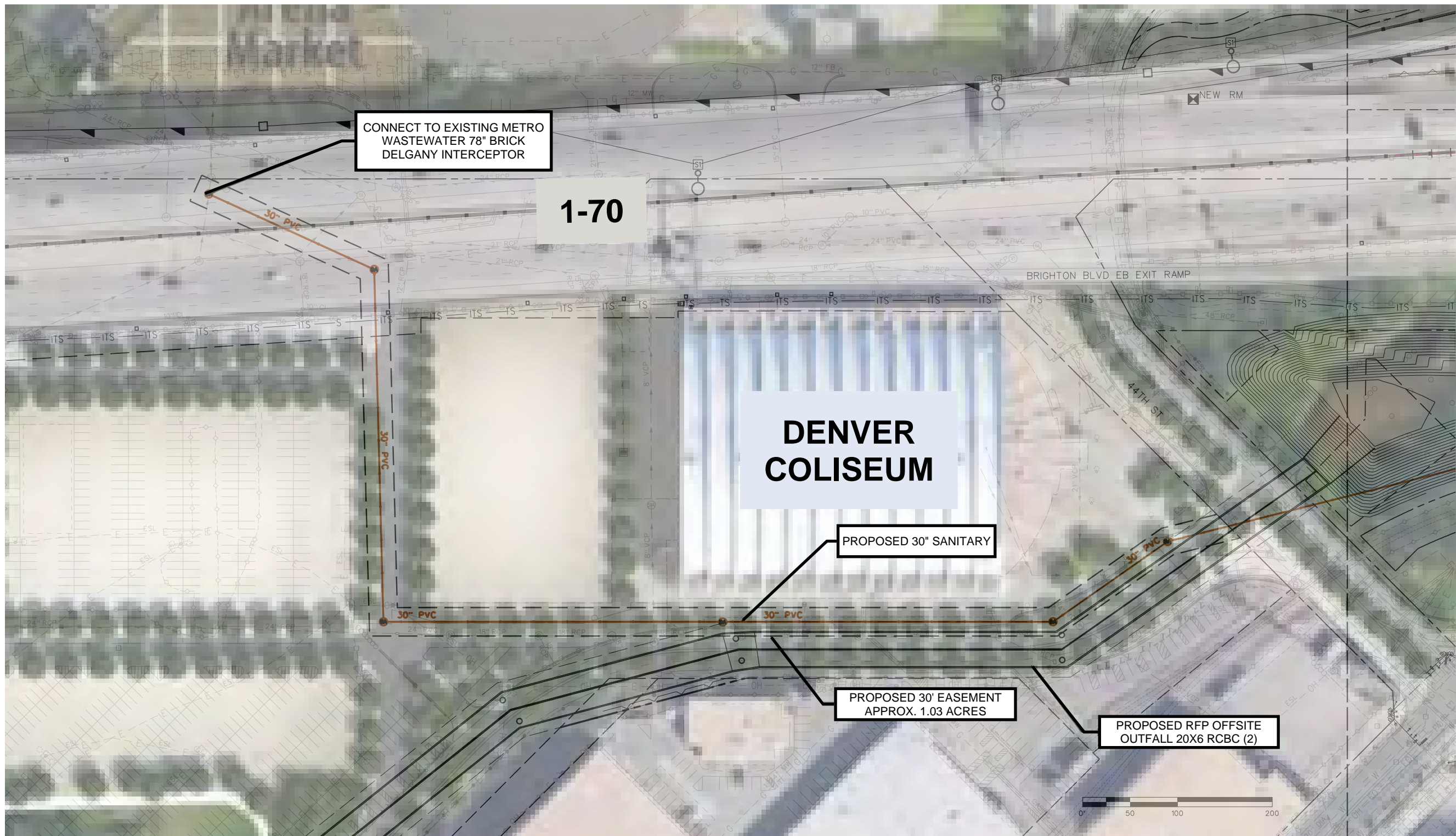
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**SANITARY SEWER REALIGNMENT**

ATTACHMENT B

ATC NUMBER  
**11.2**

SHEET NUMBER 1 OF 1





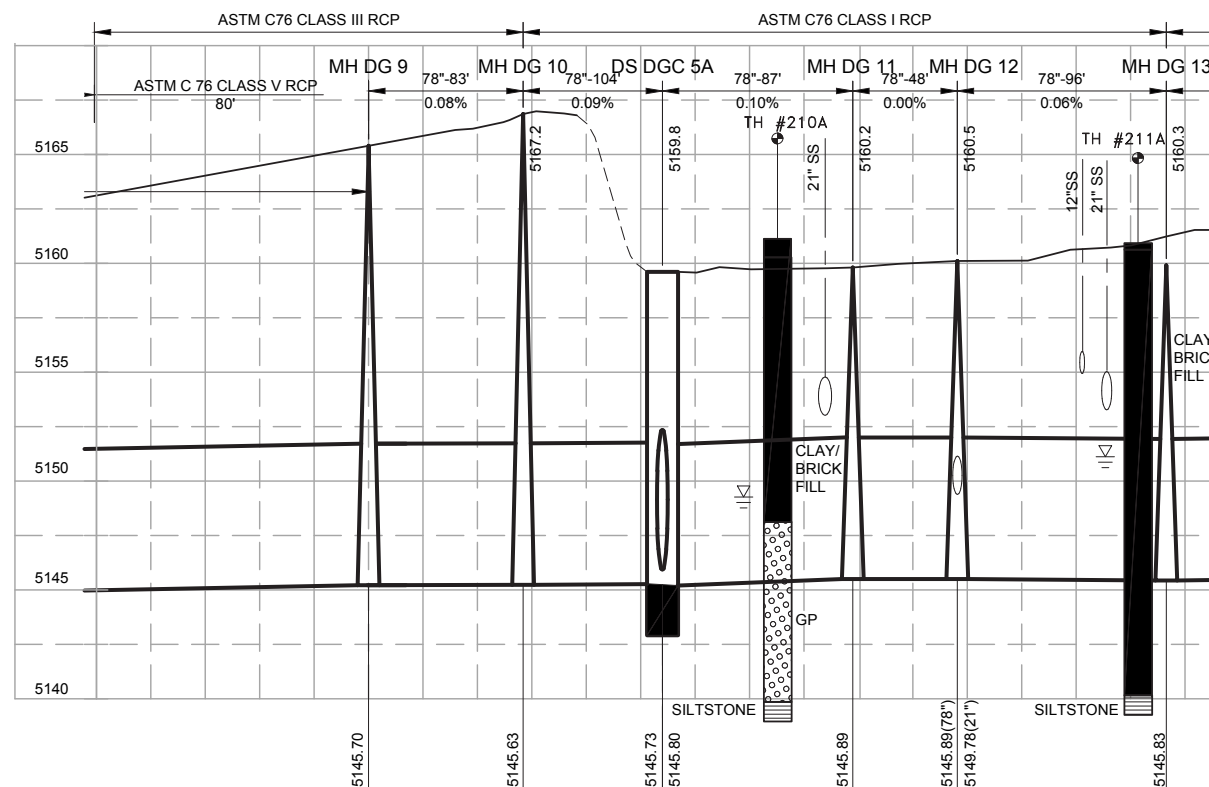
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B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	4
B.9	ADDITIONAL INFO	4
B.9	ADDITIONAL INFO	5
C.3	RIGHT-OF-WAY	6

ALTERNATIVE TECHNICAL CONCEPT  
**SANITARY SEWER REALIGNMENT**  
 ATTACHMENT C

ATC NUMBER  
**11.2**  
 SHEET NUMBER 1 OF 1



**DELGANY INTERCEPTOR**  
NOT TO SCALE



REFERENCE	SECTION	PAGE
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B.7	CONCEPTUAL DWGS	4

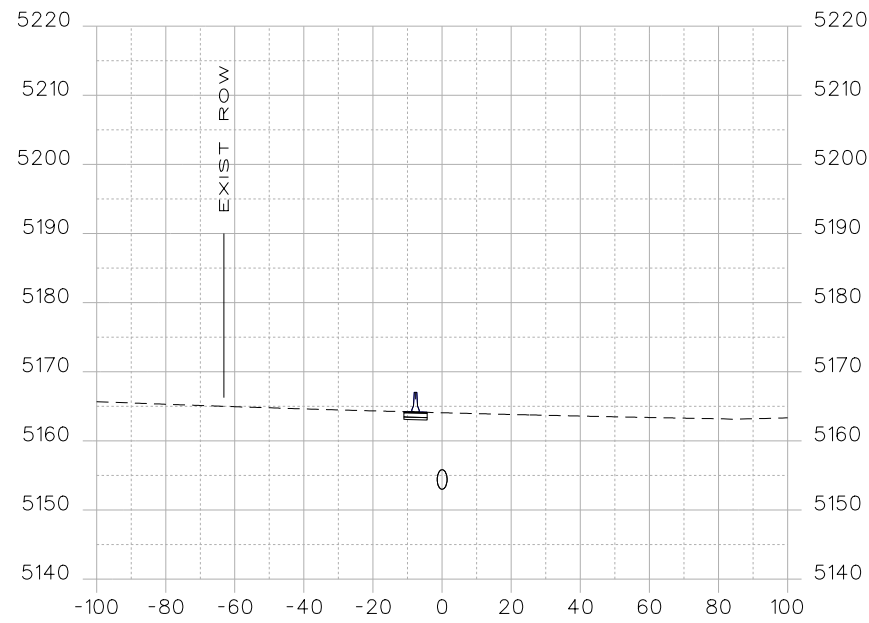
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**SANITARY SEWER REALIGNMENT**

ATTACHMENT D

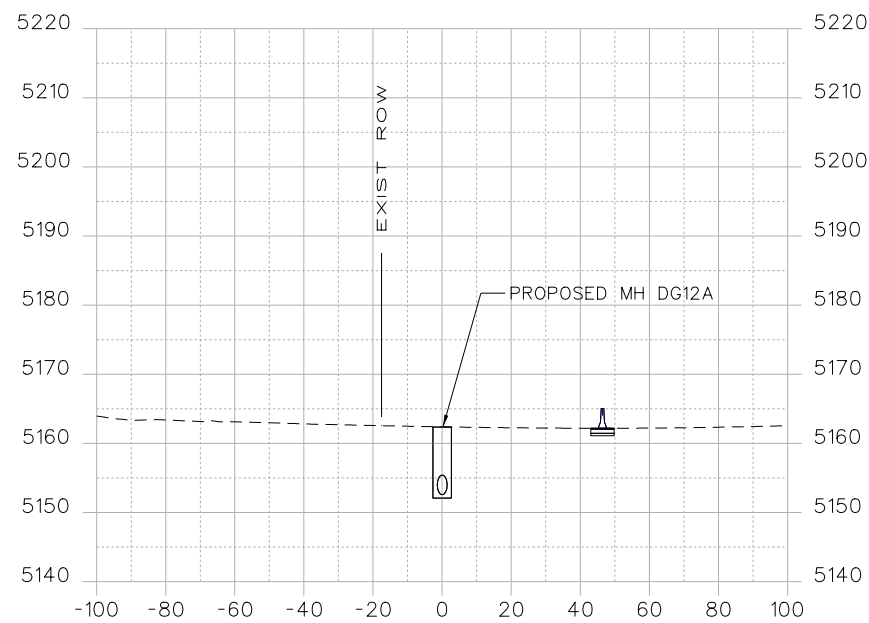
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SHEET NUMBER 1 OF 1

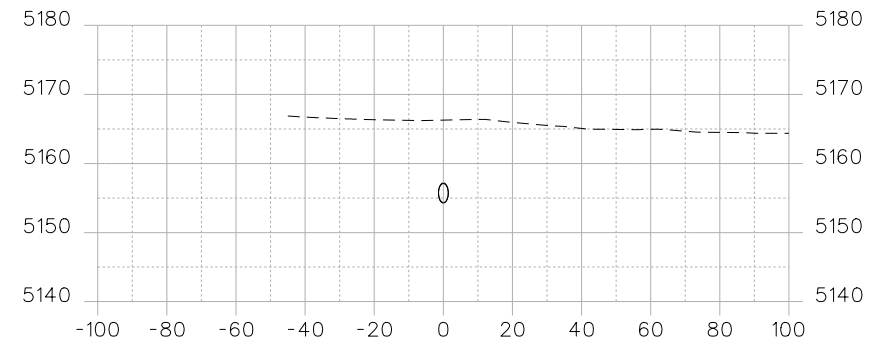




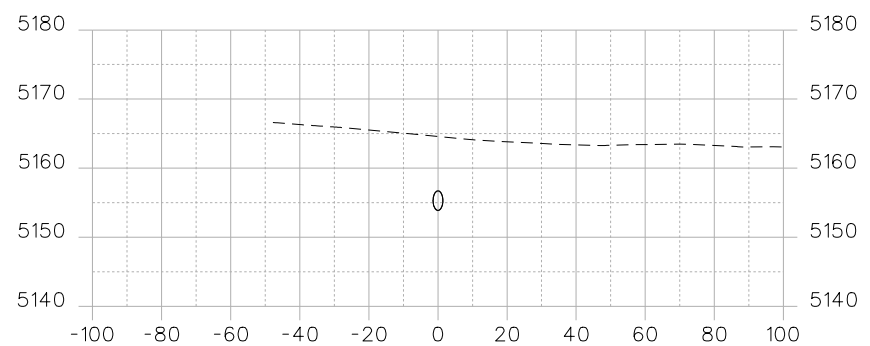
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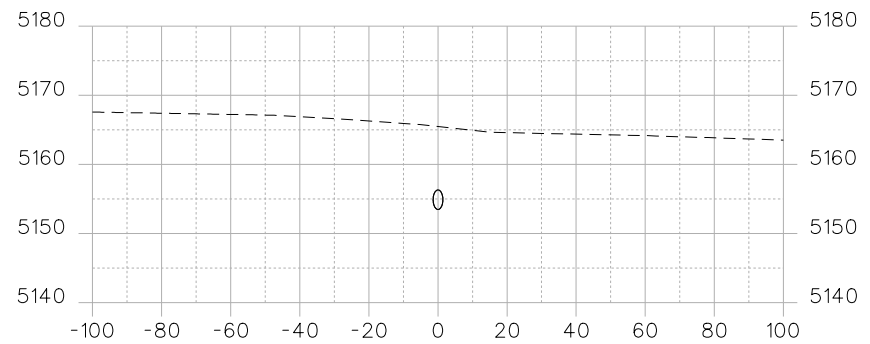
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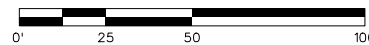
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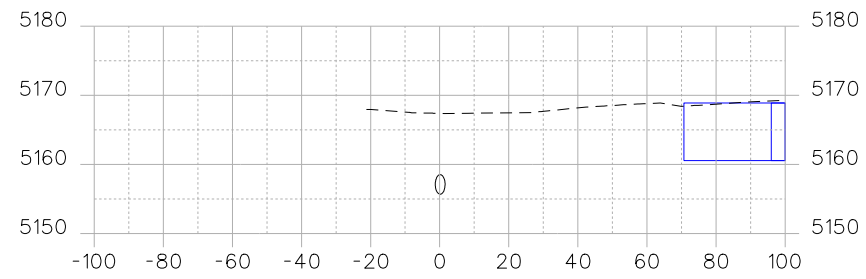
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**SANITARY SEWER REALIGNMENT**

ATTACHMENT E

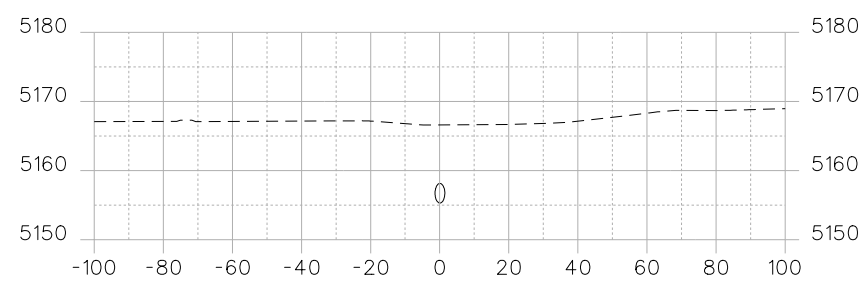
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SHEET NUMBER 1 OF 11

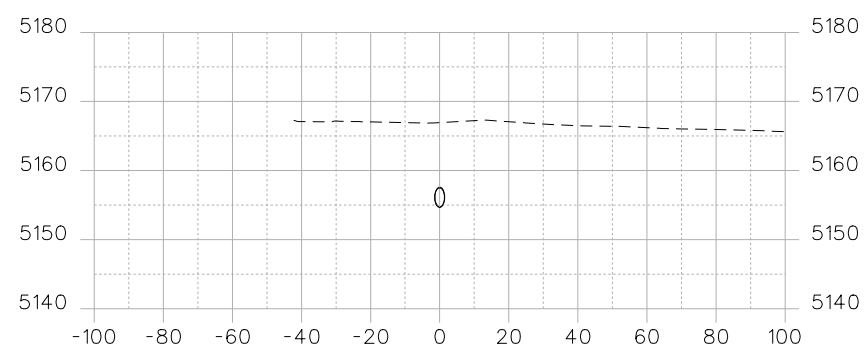




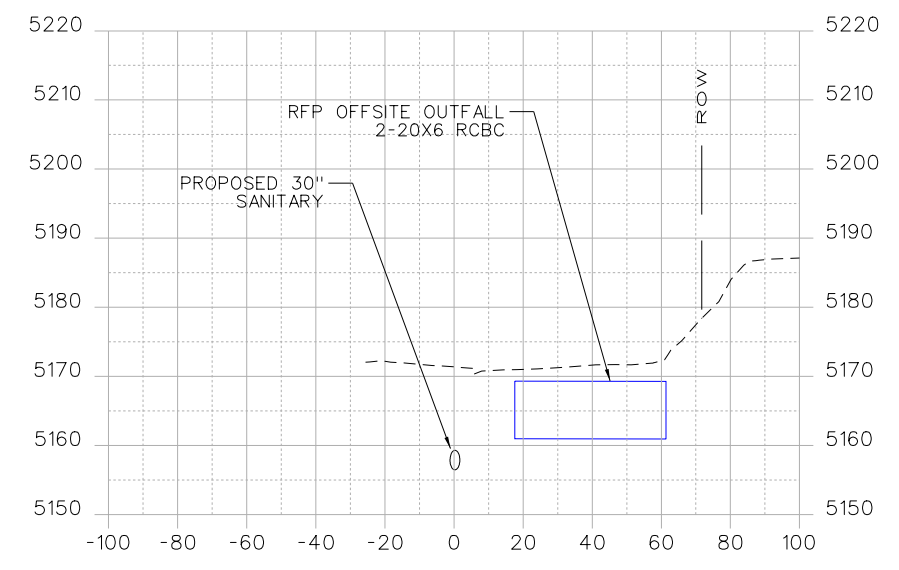
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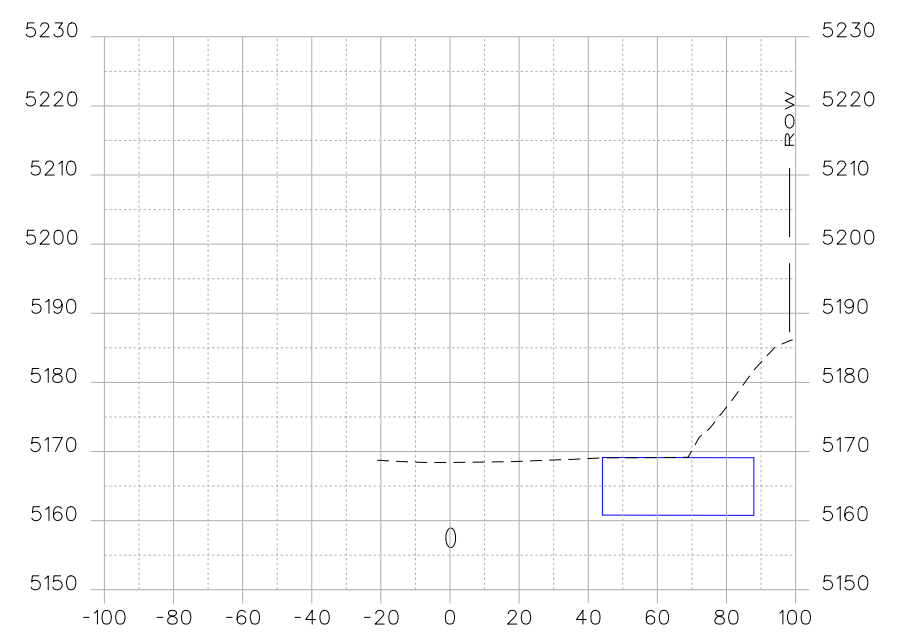
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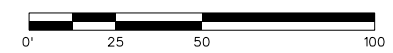
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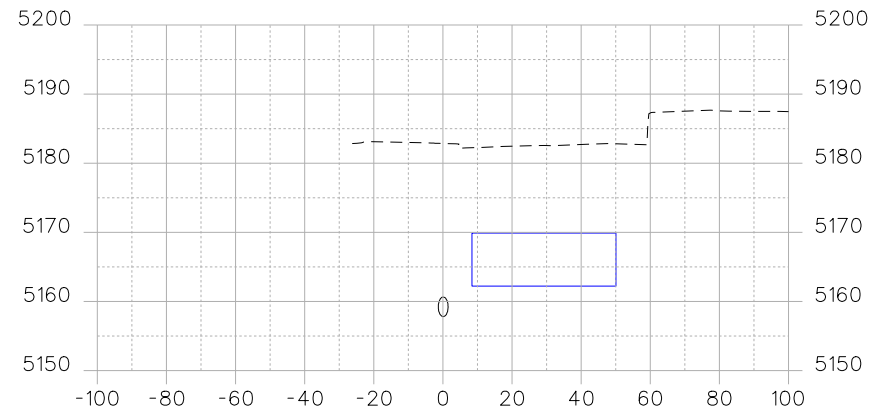
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B.9	ADDITIONAL INFO	5

ALTERNATIVE TECHNICAL CONCEPT  
**SANITARY SEWER REALIGNMENT**

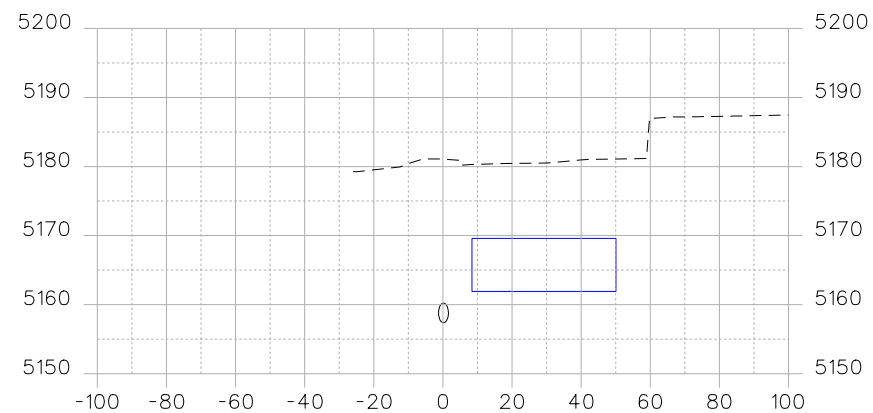
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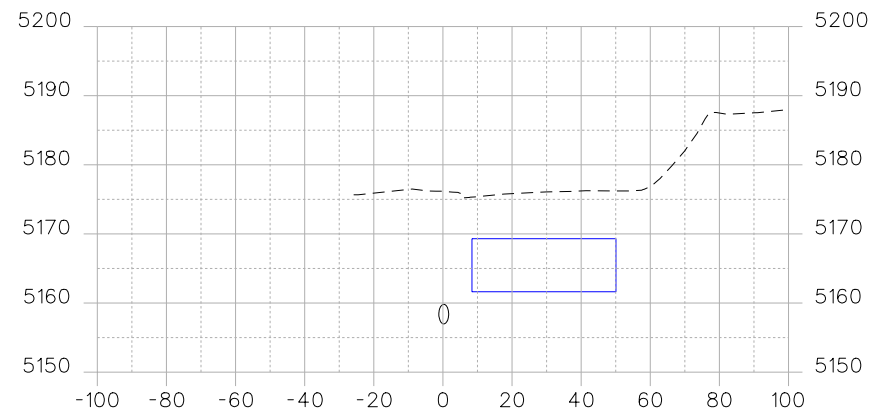
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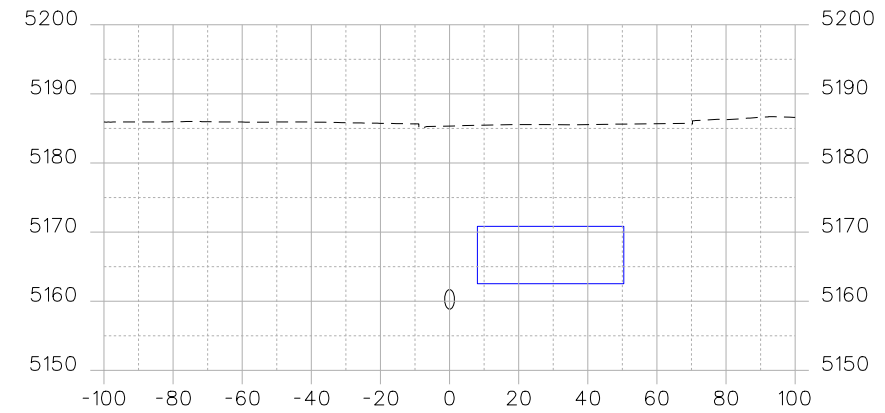
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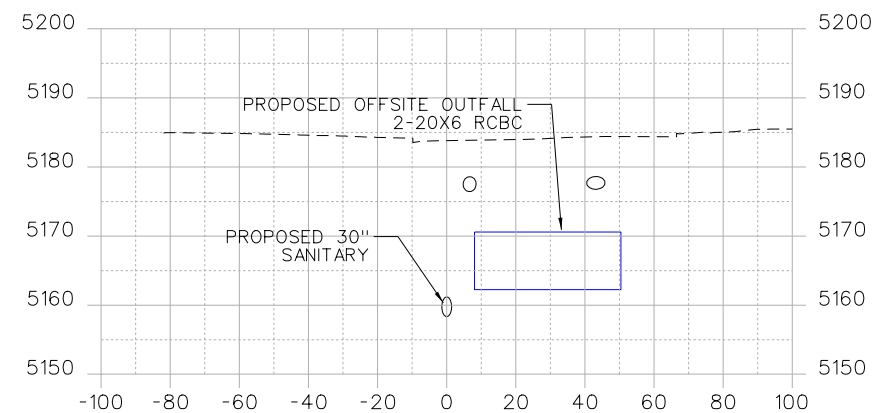
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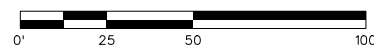
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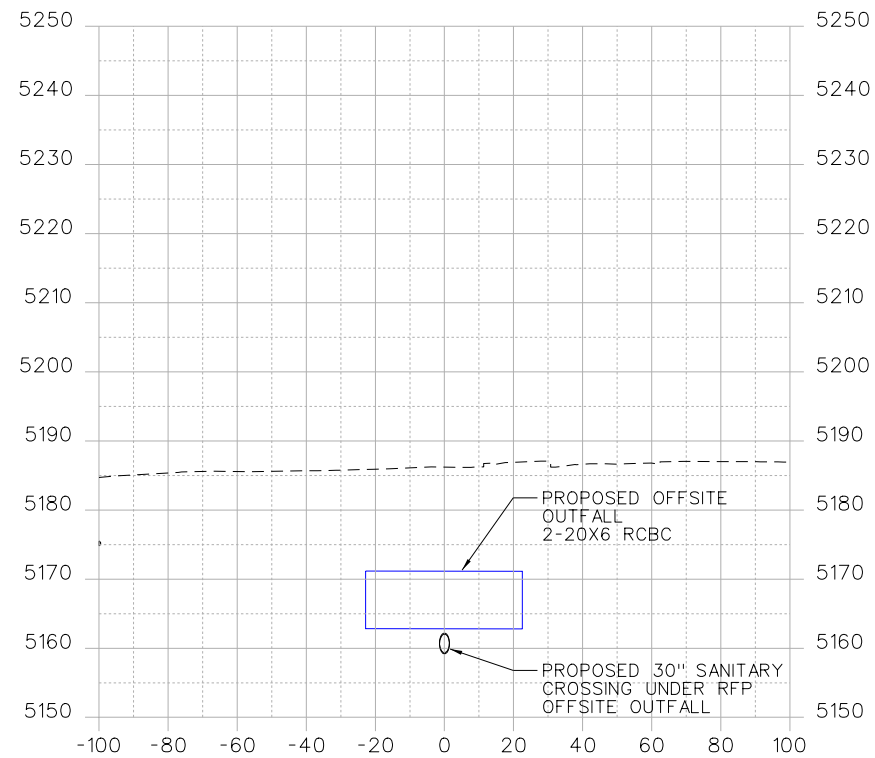
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B.9	ADDITIONAL INFO	5

ALTERNATIVE TECHNICAL CONCEPT  
**SANITARY SEWER REALIGNMENT**

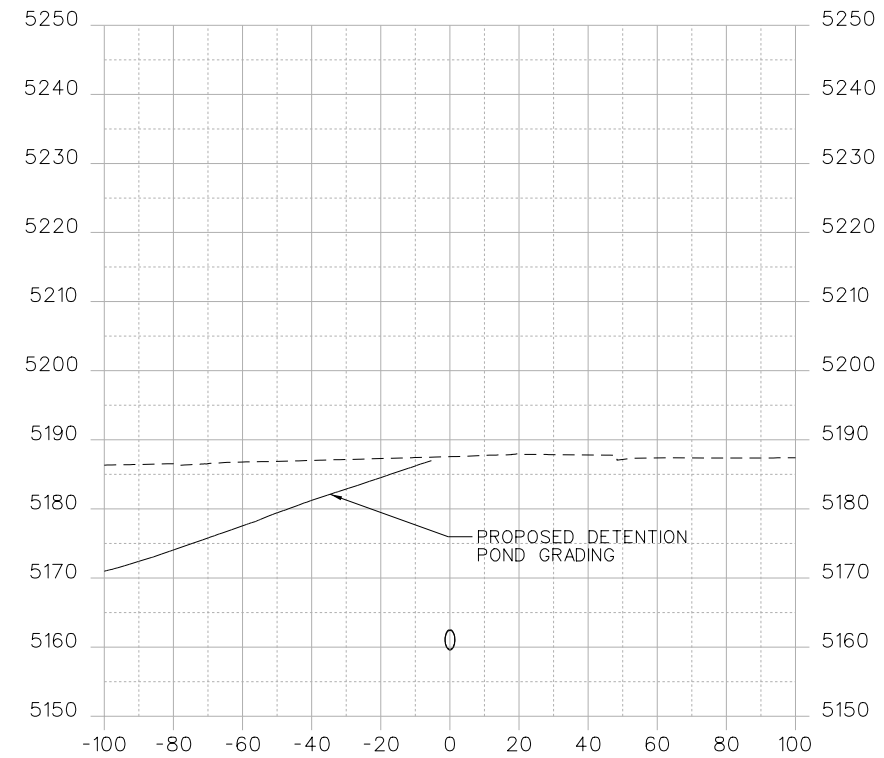
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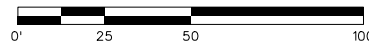
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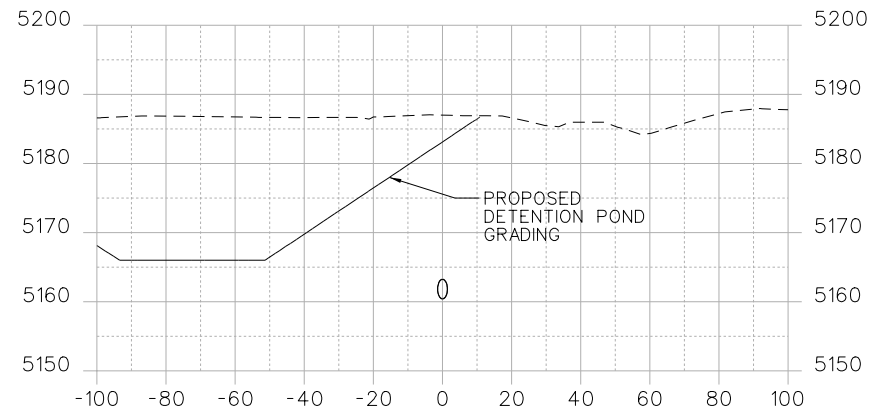
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B.9	ADDITIONAL INFO	5

ALTERNATIVE TECHNICAL CONCEPT  
**SANITARY SEWER REALIGNMENT**

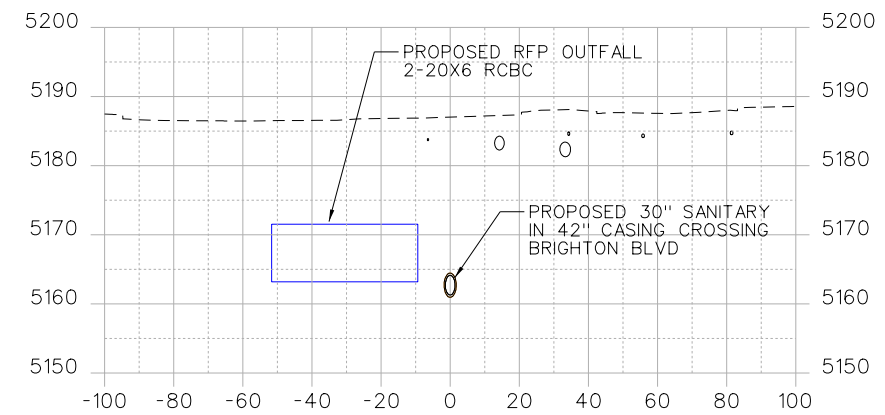
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**11.2**

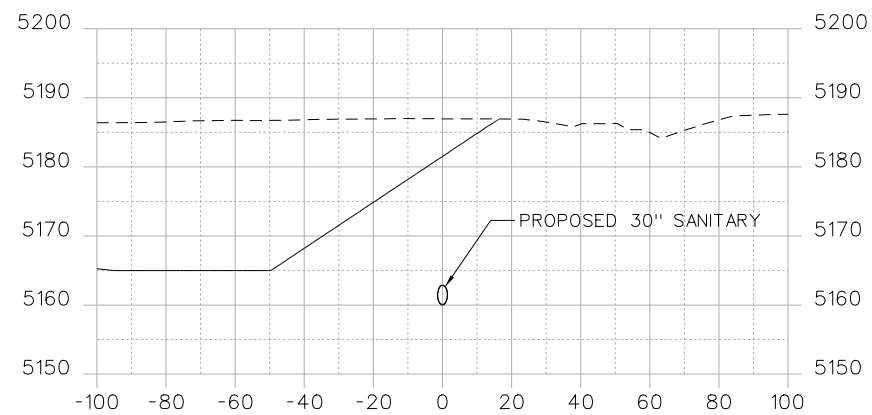
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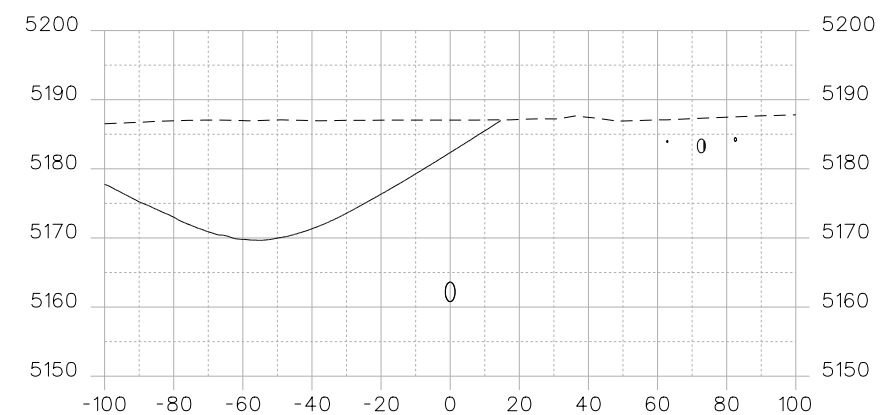
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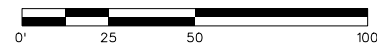
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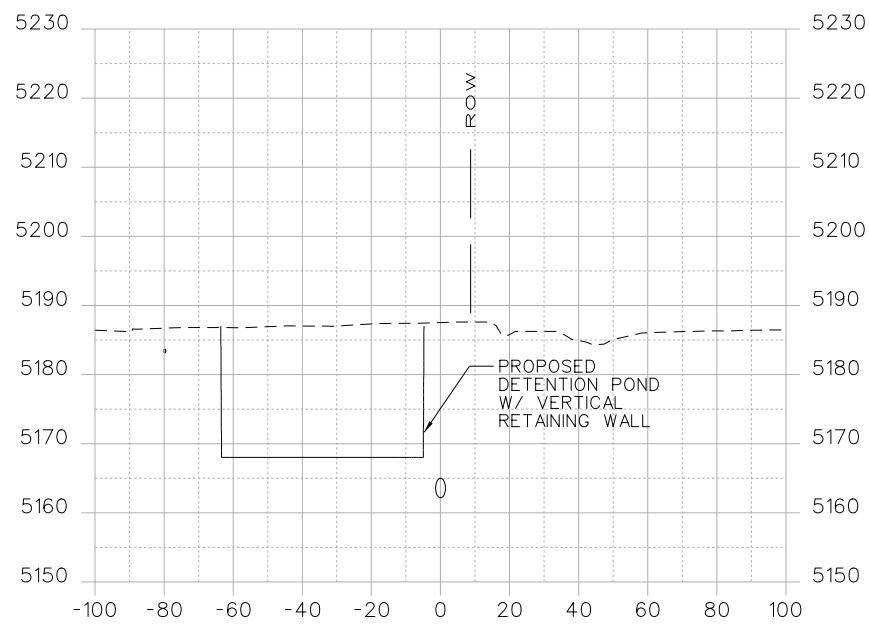
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ALTERNATIVE TECHNICAL CONCEPT  
**SANITARY SEWER REALIGNMENT**

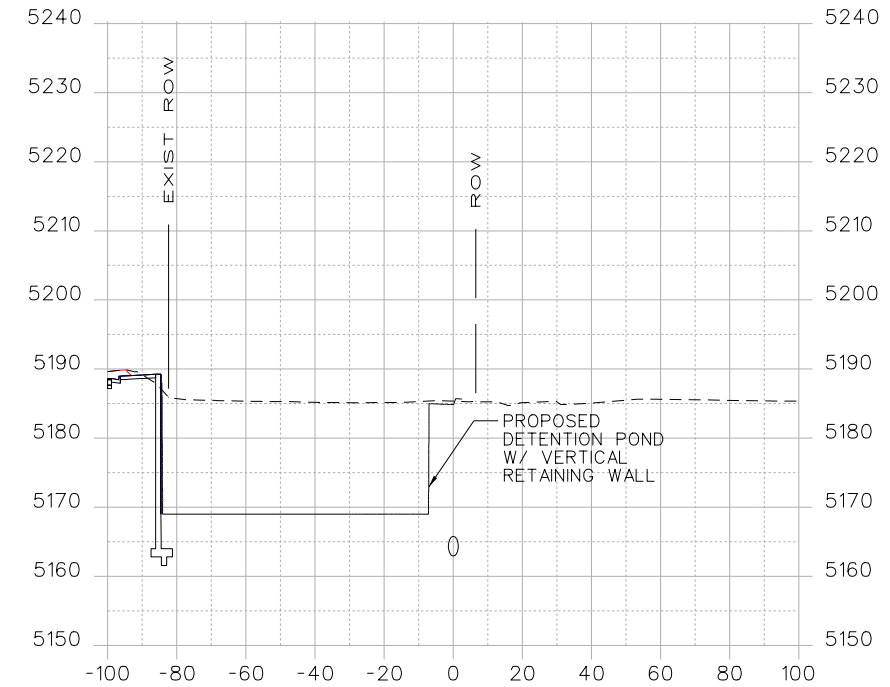
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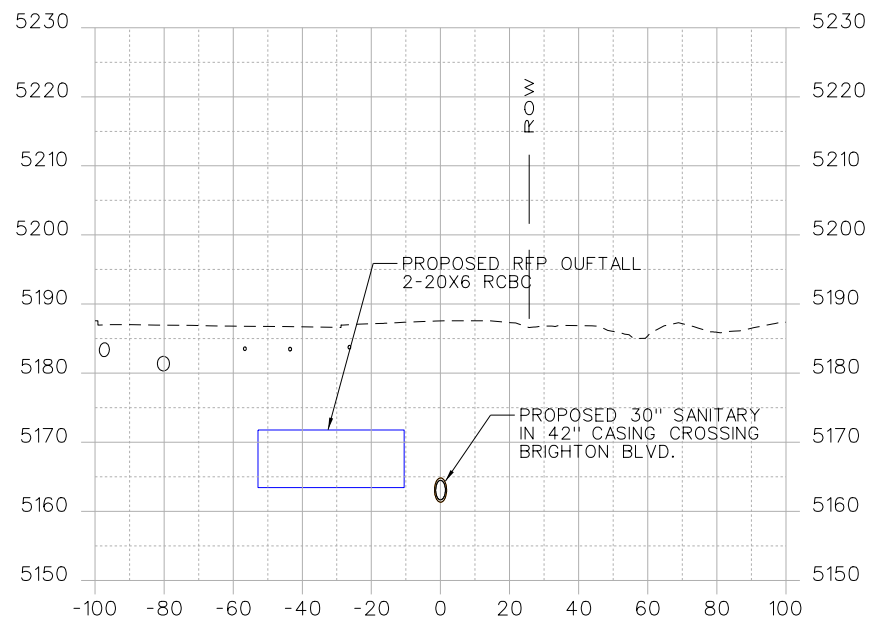
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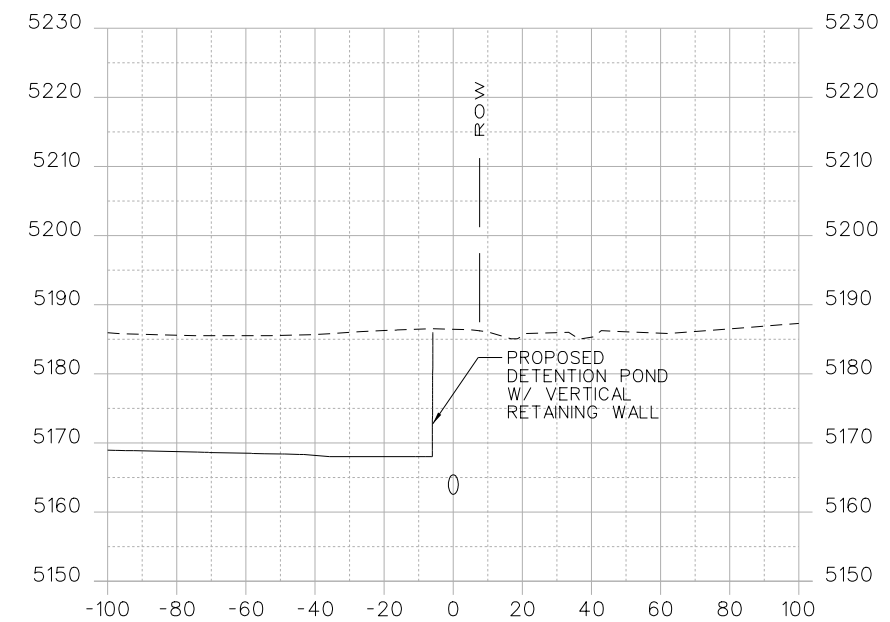
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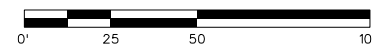
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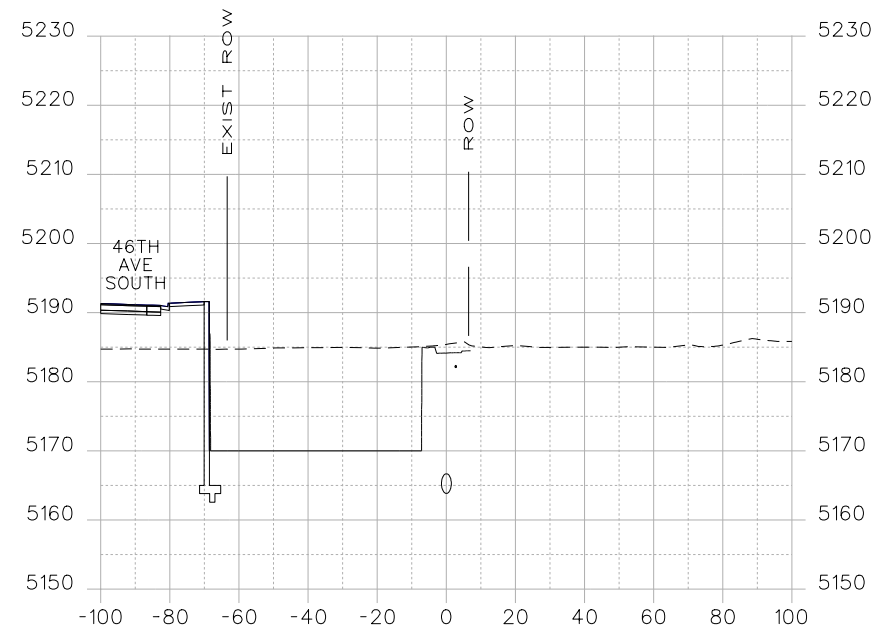
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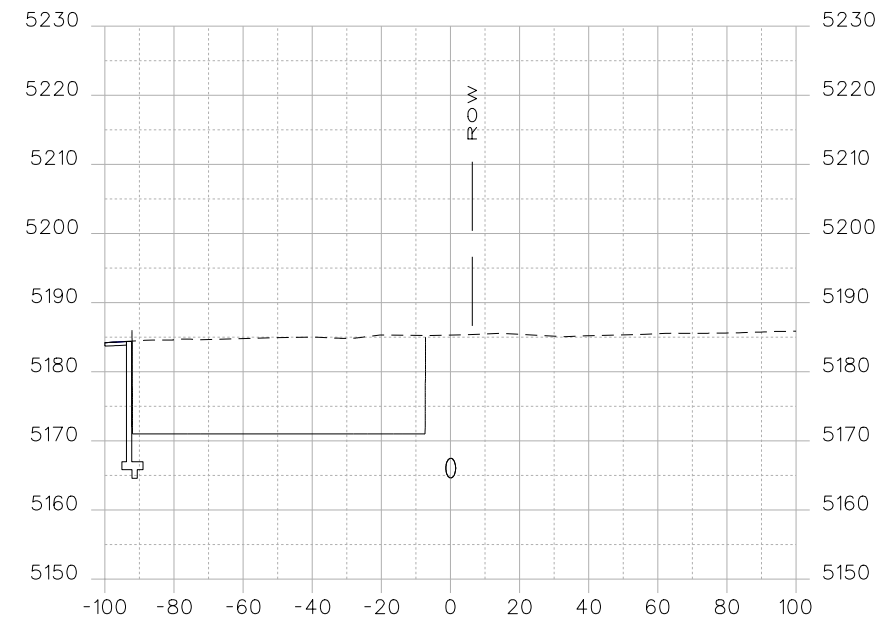
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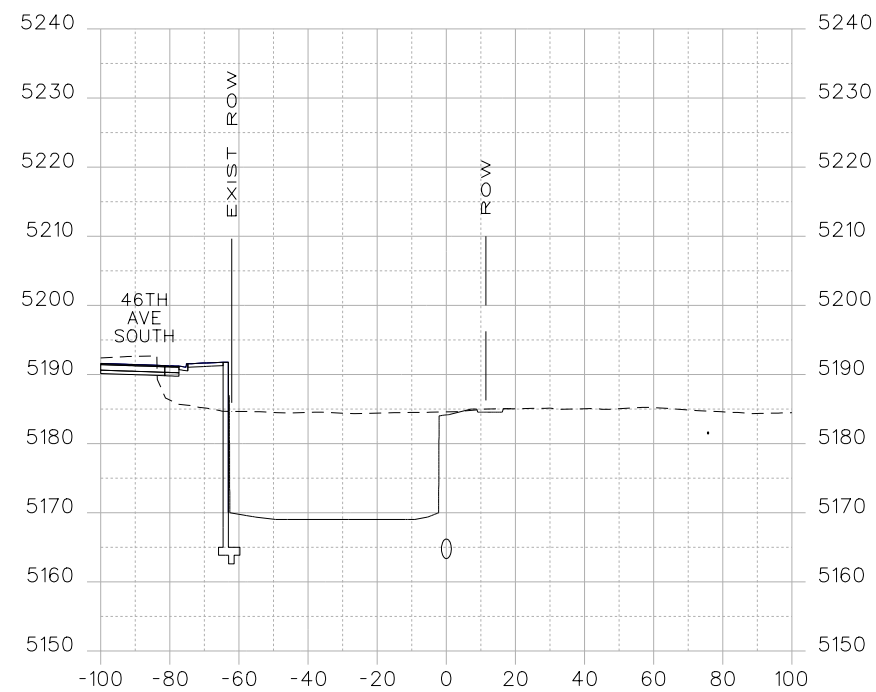




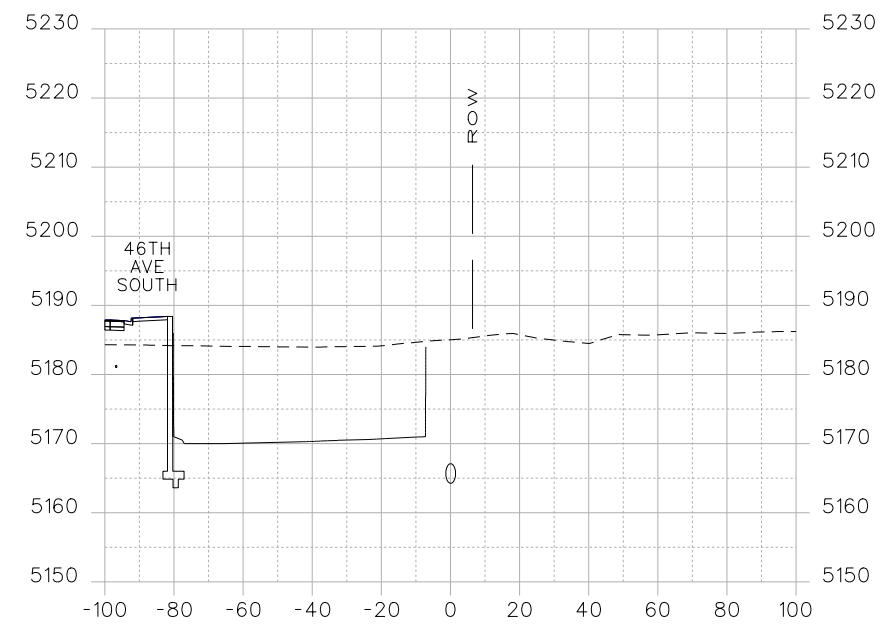
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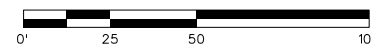
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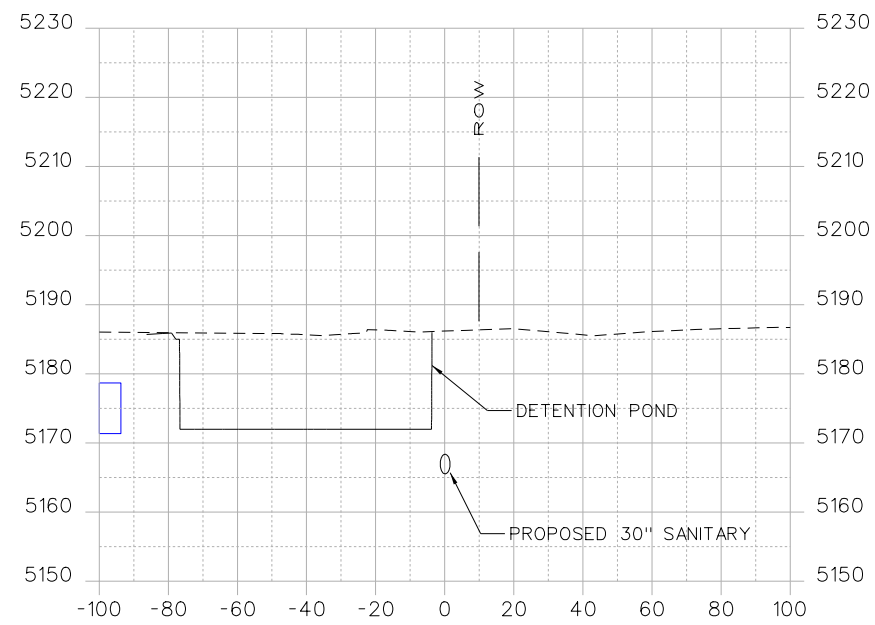
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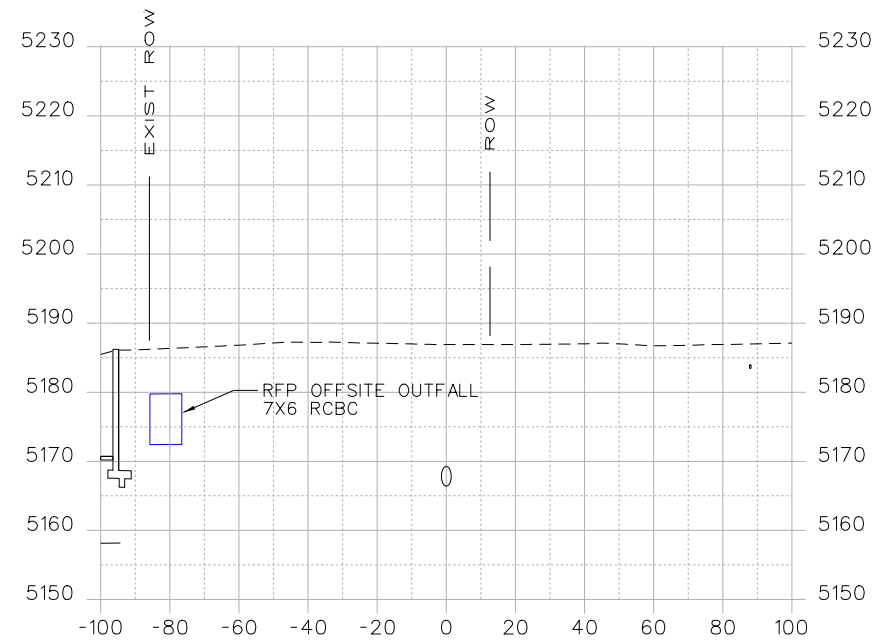
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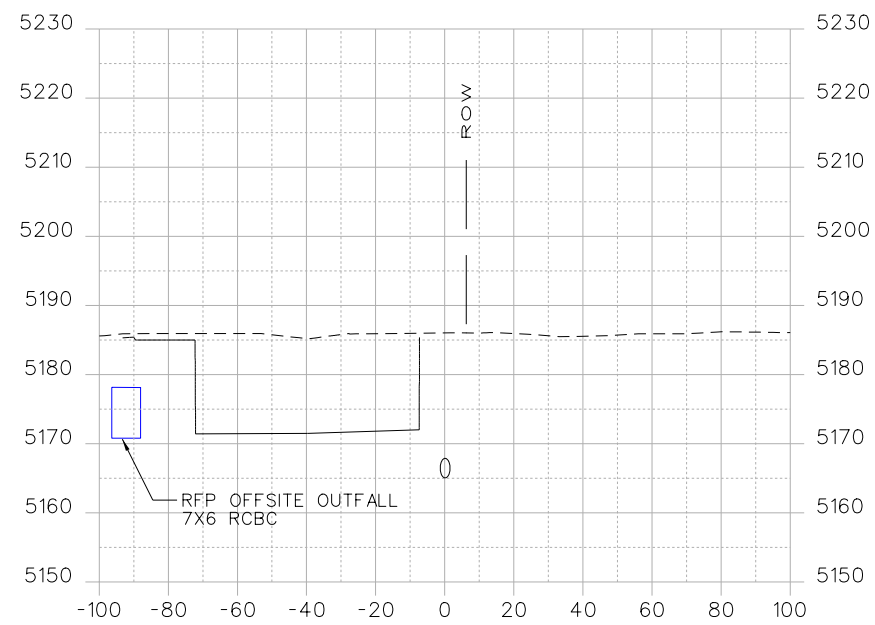
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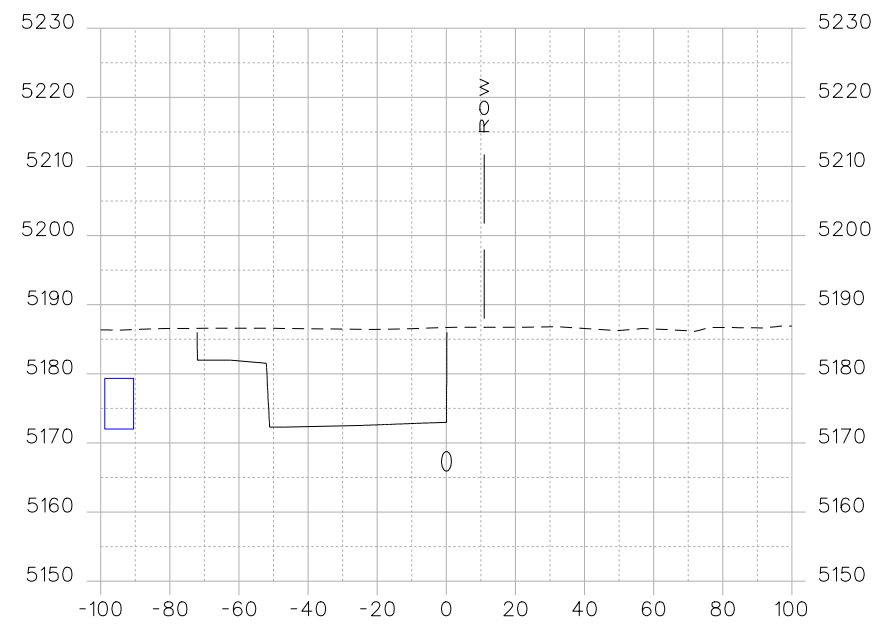
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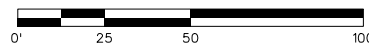
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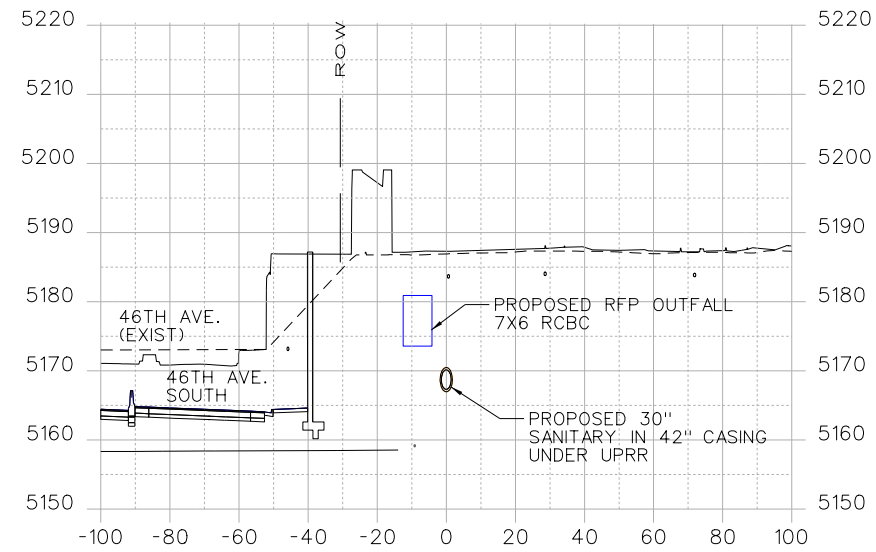
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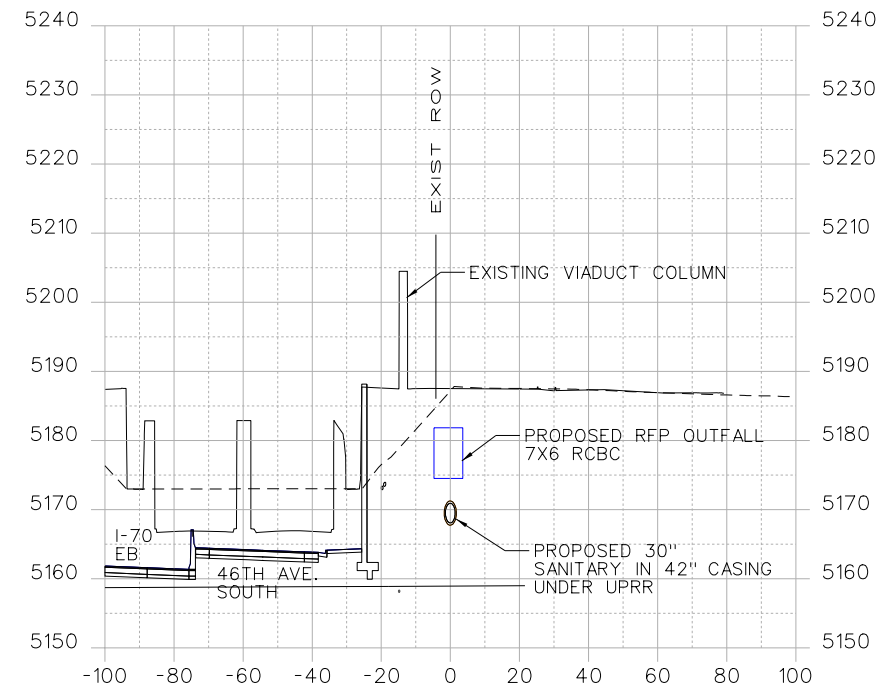
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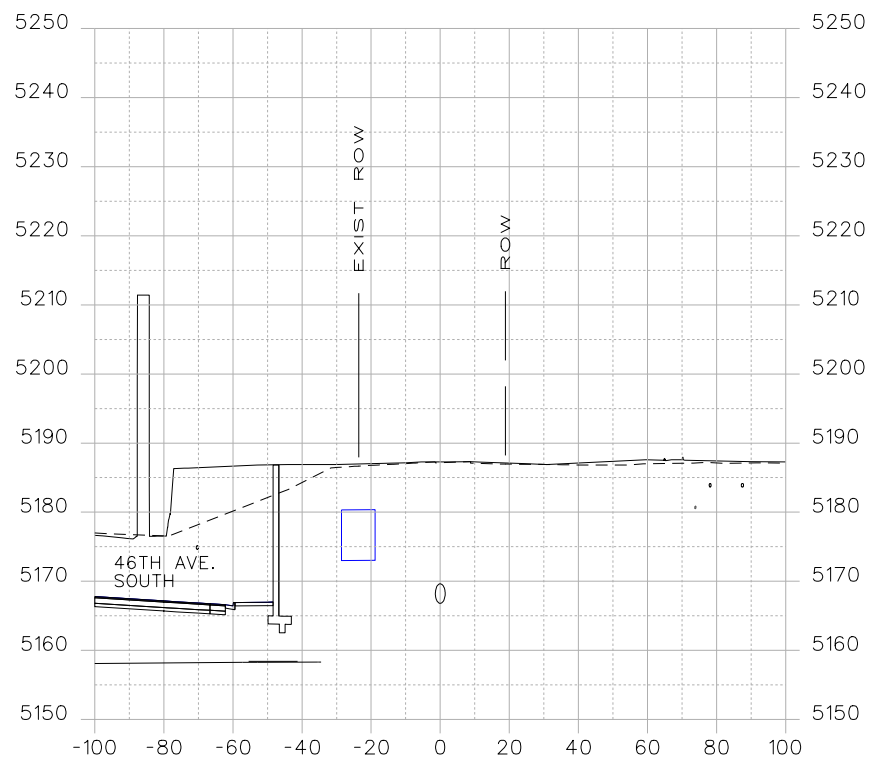
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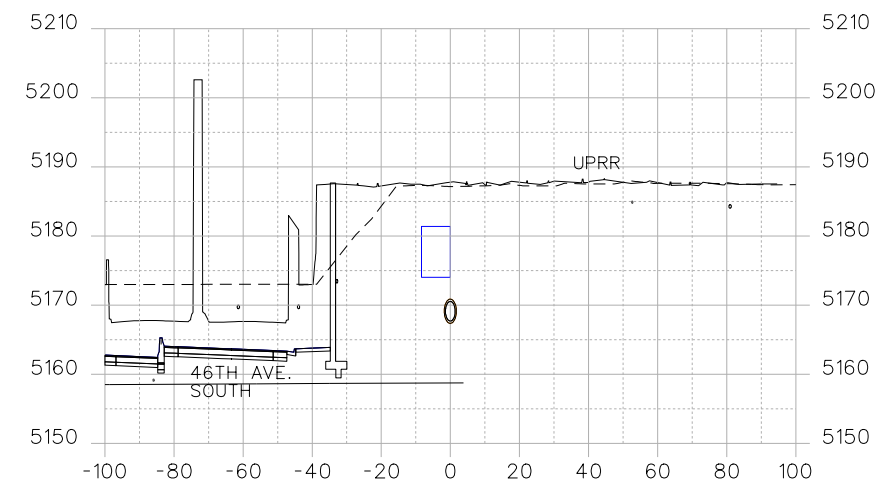
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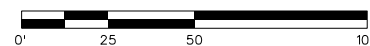
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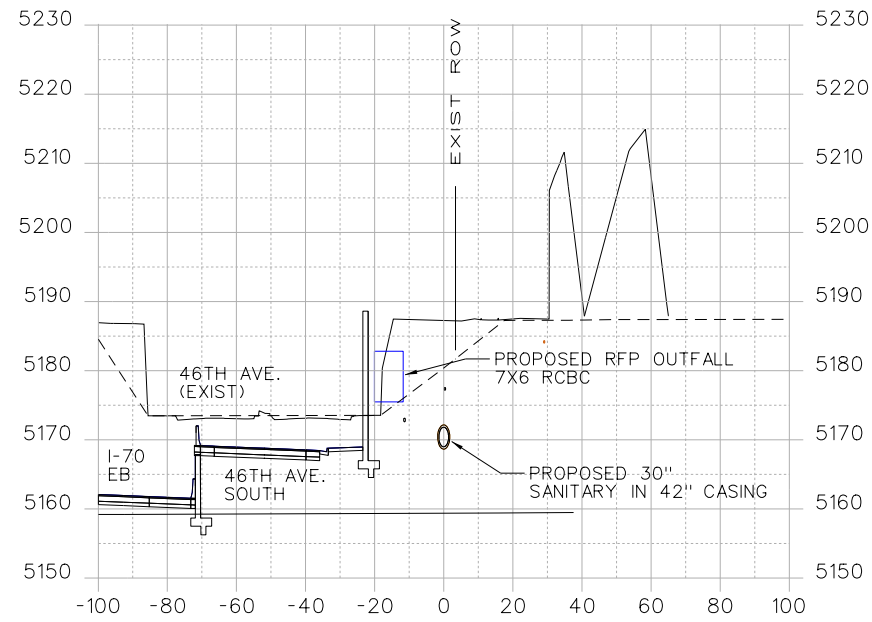
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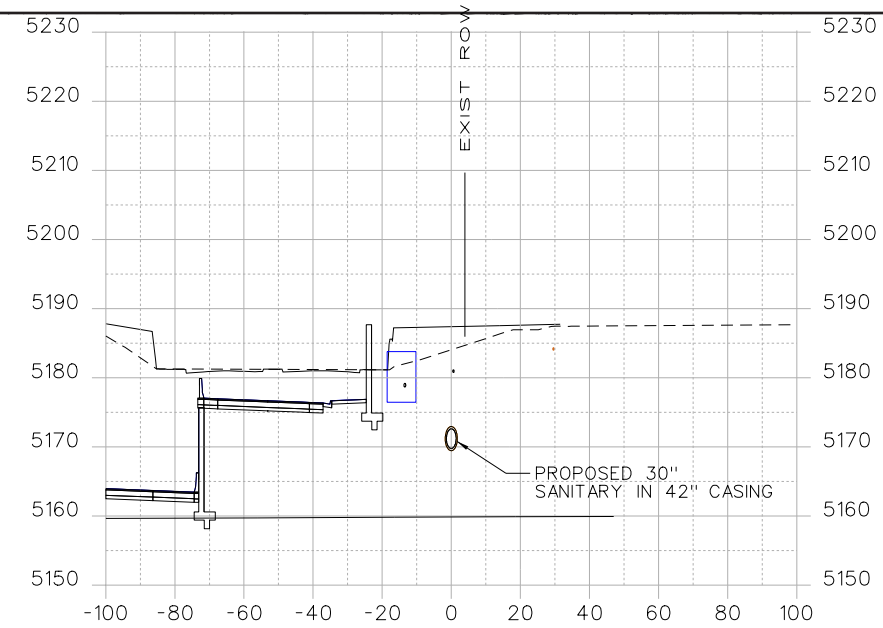
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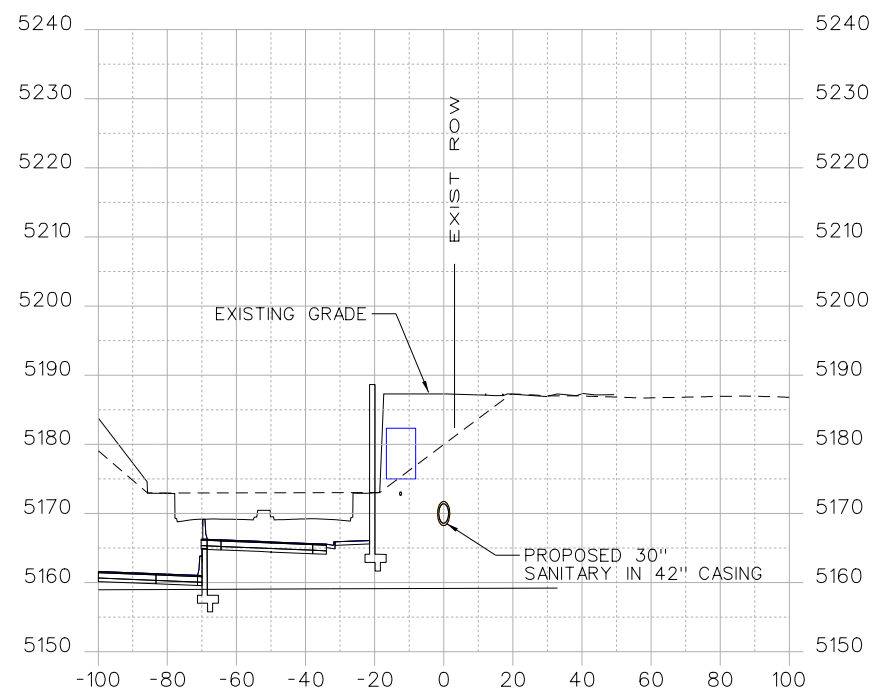
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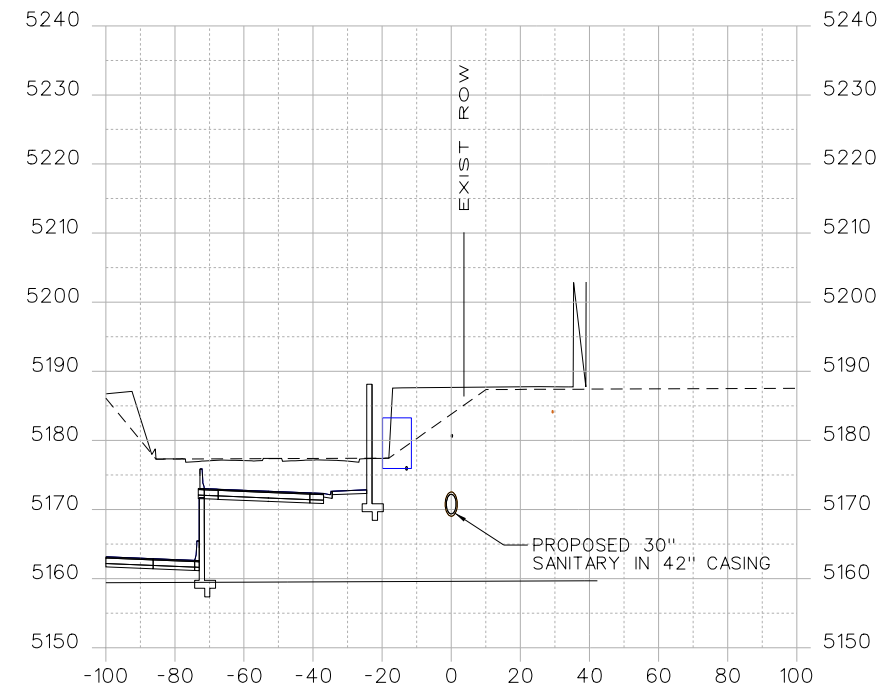
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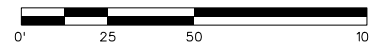
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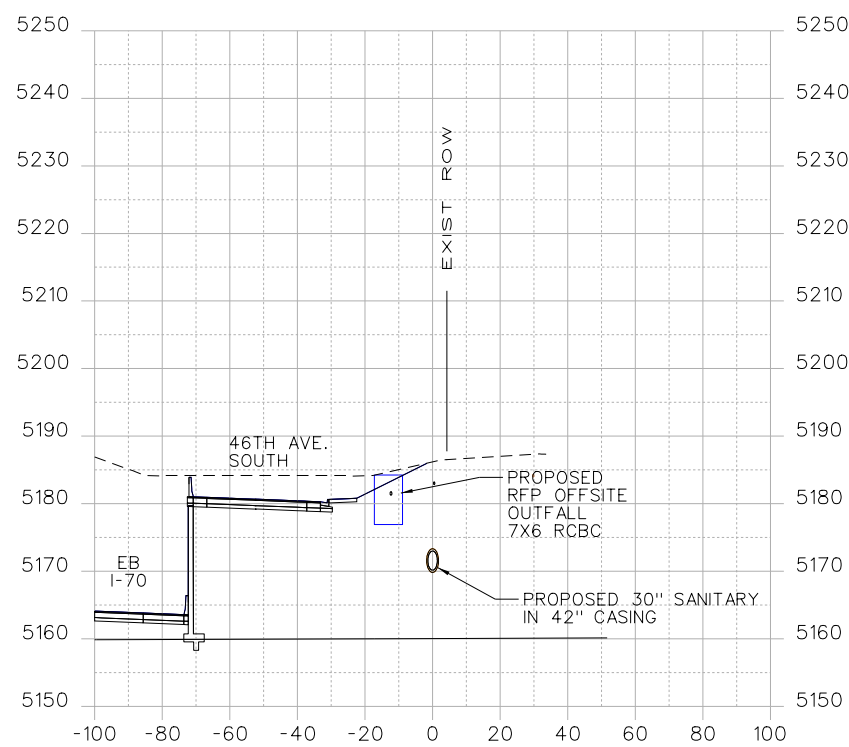
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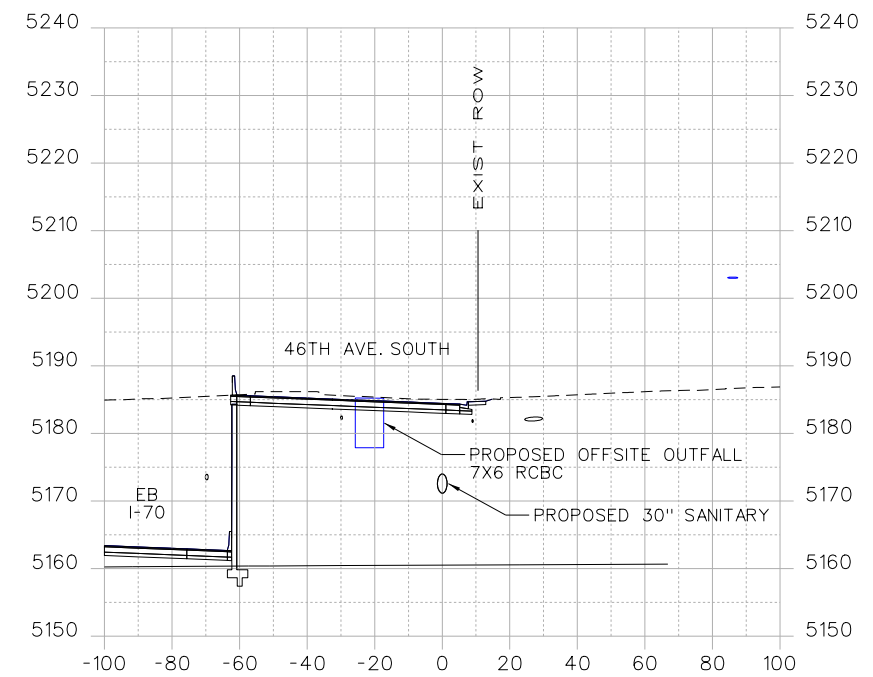
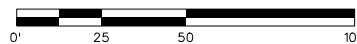
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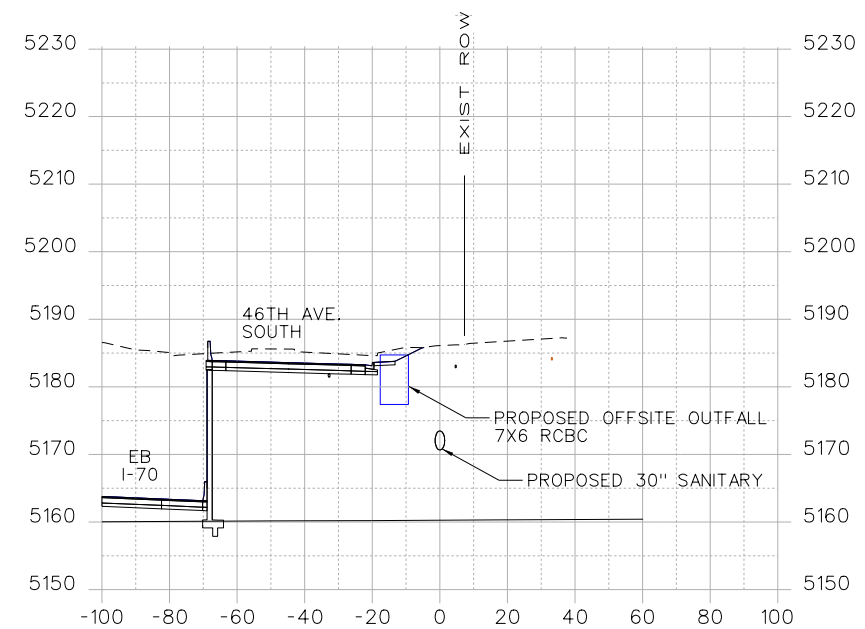
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ALTERNATIVE TECHNICAL CONCEPT  
**SANITARY SEWER REALIGNMENT**

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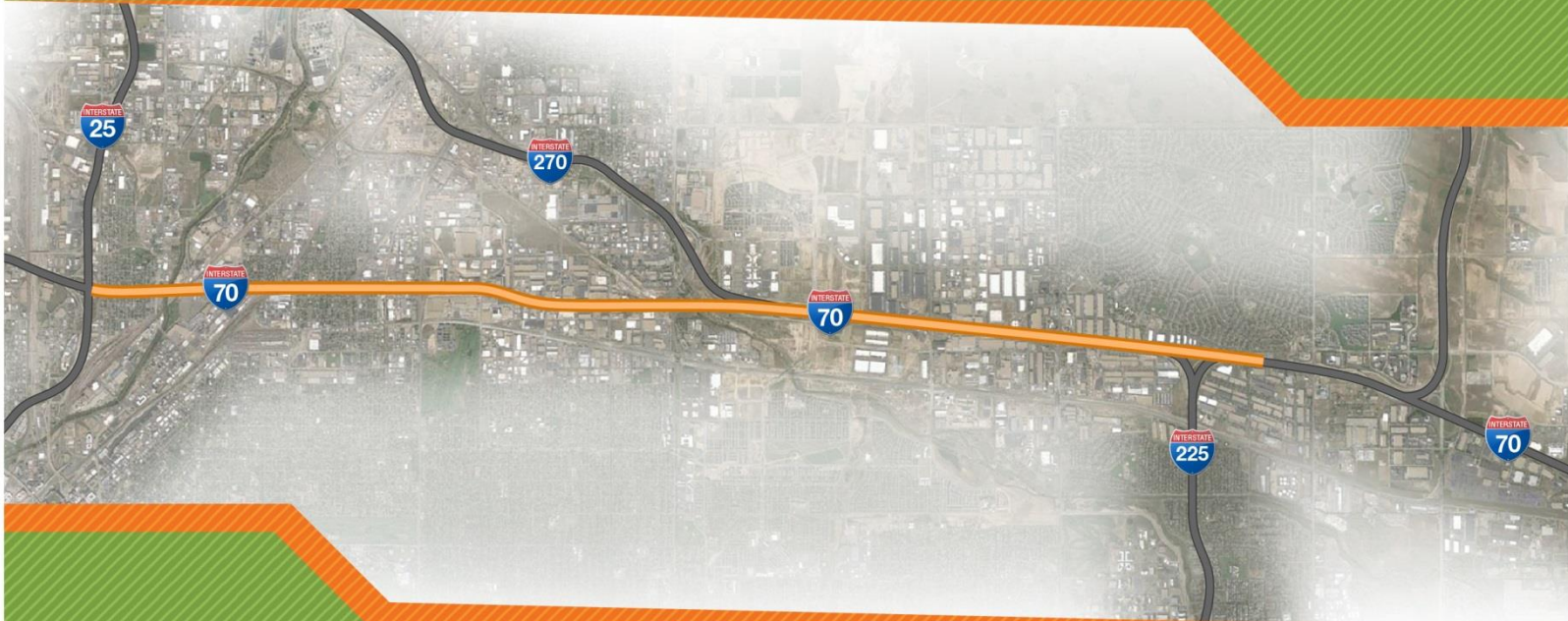
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# Central 70 Project

Attachment F – Tracked Changes to Section 10.10.13.01 of  
Schedule 10B

ATC 11.2



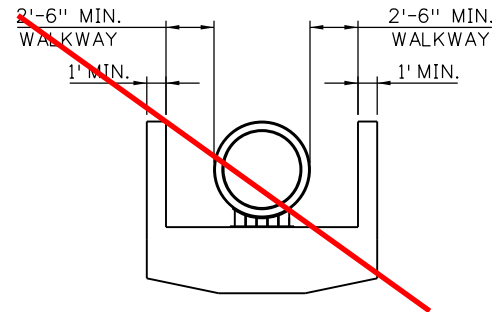
Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

August 16, 2016

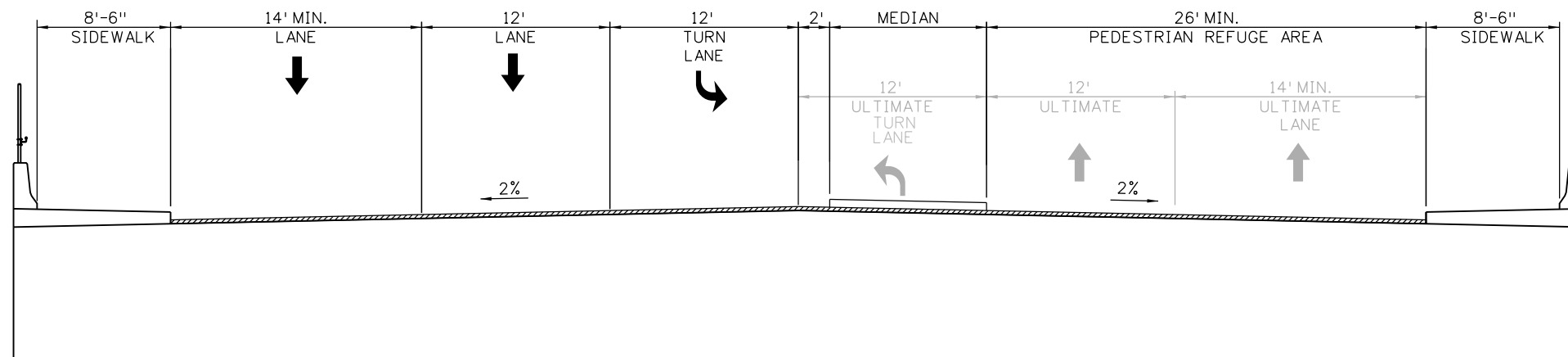




**Sanitary Sewer Bridge over I-70 Mainline Eliminated**

~~SANITARY SEWER BRIDGE OVER I-70 MAINLINE~~

(STR. NO. MISC-E-17-IT)




**YORK STREET OVER I-70 MAINLINE**

(STR. NO. E-17-AEY)

Print Date: 2/17/2016	
File Name: I3599BRDG_TypSec01.dgn	
Horiz. Scale: NTS	Vert. Scale: NTS
Unit Information	Unit Leader Initials
<b>ATKINS</b>	7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



2000 South Holly Street  
Denver, CO 80222  
Phone: 303-757-9934 FAX: 303-757-9907

Region 1 KJS

<b>PRELIMINARY</b>
No Revisions:
Revised:
Void:

STRUCTURE TYPICAL SECTIONS			
Designer:	Structure Numbers		
Detailer:			
Sheet Subset: 10B Struct	Subset Sheets: 02 of 12		

<b>Project No./Code</b>
FBR 0704-234
19631
Sheet Number <b>2</b>

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DATE: August 31, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 12.2

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 12.2 has been reviewed by the Procuring Authorities.

Detailed ATC 12.2 proposes to eliminate the 72 inch storm sewer bridge over I-70 Mainline through optimization of the alignment within Project ROW for the offsite drainage to the South Platte River.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. As set forth in the Project Agreement, the Developer shall:
  - a. be responsible for any additional Environmental Approvals required for the ATC
  - b. be responsible to obtain any Additional Right-of-Way required for the ATC
  - c. be responsible to obtain any required Railroad Permits required for the ATC
- 2. The Procuring Authorities reserve the right to require resubmittal of this ATC in the future in order to address changes necessitated by any subsequent modifications to the RFP drainage requirements.

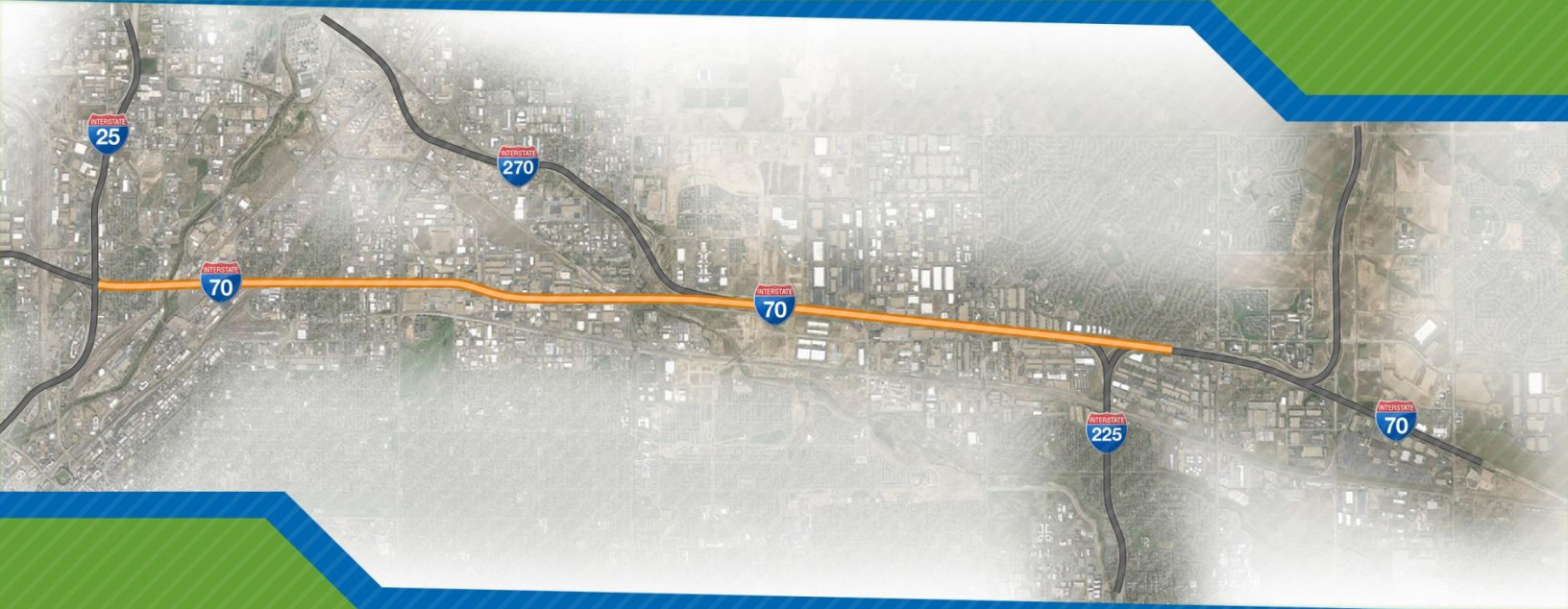




# Central 70 Project

Alternative Technical Concept Submission

ATC 12.2



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 12.2**

**Optimize Offsite Drainage**

### Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission

*Resubmitted to address the Procuring Authorities response to ATC No. 12.1.*
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC to remove references to the Two Basin Drainage Project (TBDP).

Kiewit-Meridiam Partners (KMP) is proposing to eliminate the 72 in. storm sewer bridge over I-70 mainline through optimization of the alignment within Project right-of-way for the offsite drainage to the South Platte River, as shown on **Attachment B**. This ATC will reroute the offsite flows at York St. to the west and utilize the Offsite Outfall System on the south side of I-70 as shown in the Project Agreement (PA). Ultimately, the flows will discharge into the South Platte River.

By rerouting the contributing flows to the west, full capacity of the existing 72 in. storm system in York St. on the north side of I-70 mainline will be available for additional future utilization. This will allow KMP to connect the proposed westbound 46<sup>th</sup> Ave. North storm system into the 72 in. storm system in York St. as opposed to the PA concept design connection point at Race St.

#### 2. Relevant RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC to clarify which subsection of the PA is relevant.

### ATC 12.2 Benefits

- ✓ Lower initial and future capital and maintenance costs
- ✓ Equal or better performance and reliability
- ✓ Shorter schedule duration
- ✓ Improved public safety
- ✓ Reduced traffic and community impacts
- ✓ Optimized scope
- ✓ Enhances community values and project benefits
- ✓ Comprehensive stormwater management



The current Draft Master Drainage Report from the PA shows the offsite outfall system discharging west of York St.; included in the storm system is a proposed 72 in. storm sewer bridge crossing I-70 mainline. Additionally, the PA references the York St. storm crossing in Schedule 10, Section 8.4.9. *Area Specific Drainage Requirements and/or Information*, Paragraph (f), *Storm Drain over the Lowered Section near York Street*.

This ATC eliminates the 72 in. storm sewer bridge structure crossing over I-70 in the Lowered Section while maintaining the historic flow capacity in the existing storm drain north of the I-70 mainline.

### 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC. References to the TBDP have been removed, and the offsite drainage outfall system has been re-analyzed without consideration of the TBDP.

KMP has performed a new scenario of the Storm Water Management Model (SWMM) to analyze the effects of removing the proposed storm sewer bridge. In the new scenario, the routing element for the 72 in. storm sewer bridge (Routing Element York\_Bridge, downstream of Node SV-20) was removed. In the PA design, the proposed storm sewer bridge was conveying the westbound flows from the 84 in. RCP within 46<sup>th</sup> Ave. South (Routing Element SV\_19). The new routing scenario will convey this system to the west which will add approximately 230 cfs to the offsite outfall system.

To accommodate the additional 230 cfs to the offsite outfall system, the concrete box culvert (CBC) will be upsized west of York St. from 7 ft. x 6 ft. to 11 ft. x 6 ft. The new total routed flow in the system will be approximately 2490 cfs which is an increase of approximately 220 cfs to the PA design. This increase in flow is consistent throughout the outfall system thereby requiring the system to be upsized accordingly throughout. The double 20 ft. x 6 ft. CBC will be increased to an equivalent of a 22 ft. x 6 ft. box for each barrel (triple 15 ft. x 6 ft.), and the quadruple celled CBC (three 11 ft. x 6 ft. and one 12 ft. x 6 ft.) near the outfall will be widened to quadruple celled 12 ft. x 6 ft. CBC. The updated SWMM routing schematic, with revised flow rates and culvert sizes, are shown on **Attachment A**.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** By eliminating the storm sewer bridge over I-70 mainline, routine maintenance of the bridge will not be required over live traffic, which eliminates the inherent dangers to the public and maintenance workers.
- **Optimize the Scope:** This ATC utilizes an outfall system to the South Platte River that is already planned within the Project. Through the utilization of this outfall system, KMP has optimized scope and eliminated the need for the 72 in. storm bridge which facilitates raising the grade of I-70 mainline to minimize construction quantities and impacts associated with groundwater. Additionally, this ATC will eliminate approximately 1,200 linear ft. of pipe run associated with the 72 in. westbound system to Race St. This ATC will also facilitate a reduction in size from 72 in. to 36 in. of over 400 linear ft. of pipe from Race St. to 47<sup>th</sup> Ave.
- **Optimize Operating and Life Cycle Maintenance Costs:** Through elimination of the 72 in. storm bridge, this ATC facilitates raising the grade of I-70 mainline which will decrease groundwater impacts and lower construction and permanent dewatering costs. Additionally, it will remove all costs associated with the PA required storm sewer bridge and the associated reduction in maintenance of nearly a quarter mile of 72 in. pipe.

- **Minimize Impacts to Businesses and nearby Communities:** This ATC eliminates a storm sewer jack/bore beneath the UPRR. This ATC also moves the connection point of the westbound 46<sup>th</sup> Ave. North storm system into the 72 in. storm system at York St. and eliminates the neighborhood impacts associated with the PA's connection point in Race St.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC to further elaborate on the positive impacts associated with this ATC.

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** This ATC will minimize the environmental concerns associated with handling, disposal, and treatment of groundwater through the construction and operations and maintenance period. Additionally, this ATC decreases length of pipe to be installed which will reduce equipment operating times and will require less haul trucks through the cycle of producing, delivering, laying, and backfilling of the pipe, thereby reducing Project emissions.
- **Neighborhood Impacts:** Decreasing localized construction durations and traffic will minimize impacts to the local neighborhoods.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC to update the estimated cost savings amount.

This ATC reduces Project cost by eliminating the storm sewer bridge structure, 1,200 linear ft. of large storm sewer pipe, reducing the size of 400 linear ft. of storm sewer pipe, and minimizing costs associated with handling, treating, and disposing of groundwater for the construction and maintenance term.

**Initial cost analysis indicates an overall savings to the Project of approximately \$5 million.**

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC reduces localized construction durations and allows for resources to be reallocated to critical path operations. The total schedule savings is estimated to be between six and nine months.

## 7. Conceptual Drawings

This information **has been** amended since the submission of the previous version of this ATC.

**Attachment A:** provides a revised SWMM routing schematic and graphic representation of the proposed changes.

**Attachment B:** shows the optimized routing scheme for the offsite outfall system, and also notes the RFP drainage elements that are no longer required as a result of this ATC.

**Attachment C:** tracked changes to Section 8 of Schedule 10

**Attachment D:** cross-sections for the box culvert stretch between York St. and UPRR

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

N/A

## 9. Additional Information

This information ***has been*** amended since the submission of the previous version of this ATC to address comments on the Detailed ATC No. 12.1 response.

### **ATC No. 12.0 Comment**

*The Procuring Authorities have determined that it is premature at this time to include drainage improvements being planned by the City and County of Denver. To the extent that Projects being implemented separately by Denver alter the design of the I-70 East Project, the Procuring Authorities will conduct a re-evaluation to determine and disclose the environmental impacts caused by those alterations, and incorporate such alterations into the base design of the Project at that time.*

**KMP response:** References to other proposed improvements by the City and County of Denver have been removed from this analysis. This ATC is not dependent on any proposed improvements by others. However, the overall benefits of the ATC may be more robust if the planned drainage improvements in the area are realized.

### **ATC No. 12.1 Comment No. 1**

*Provide cross sections (including existing and proposed infrastructure) for the box culvert stretch between York Street and UPRR.*

**KMP response:** Please reference **Attachment D**.

## C. **Detailed ATC Requirements**

### 1. Risks

This information *has not been* amended since the submission of the previous version of this ATC.

There are no substantial changes anticipated to the overall risk profile of the Project associated with the proposed ATC. However, given the reduction of the impacts and general safety improvements for the public and the workforce there will be an incremental improvement of the overall project risk profile. As with all project elements, KMP will implement proven methods and procedures to mitigate any short term and long term risks through proven engineering and construction practices.

KMP is confident that long term risks will be minimized by producing a quality design that meets CDOT and UDFCD performance criteria for the drainage system, including the pipes, box culverts, detention ponds, and outfall at the South Platte River.

## 2. Handback

This information *has not been* amended since the submission of the previous version of this ATC.

Changes to handback requirements will not be required. The proposed system components will remain unchanged; they have only been optimized to accommodate the increased flows contributing to the system.

## 3. Right-of-Way

This information *has not been* amended since the submission of the previous version of this ATC.

This concept will not require additional right-of-way.

## 4. List of Required Approvals

This information *has not been* amended since the submission of the previous version of this ATC.

As noted in Section 8.4.4.b, Paragraph (v.) of the PA, drain outfalls to major drainage ways shall be designed for maintenance eligibility from the UDFCD. As the design is finalized, UDFCD will need to review and approve the proposed design. The boulder drop structure at the outlet is an example that will be refined based on final design. No issues are anticipated, as KMP team members have extensive experience in working with UDFCD on similar projects and river outfall applications.

## 5. Proposed Drafting Revisions

This information *has not been* amended since the submission of the previous version of this ATC.

### a) RFP Requirements that are Inconsistent with Proposed ATC

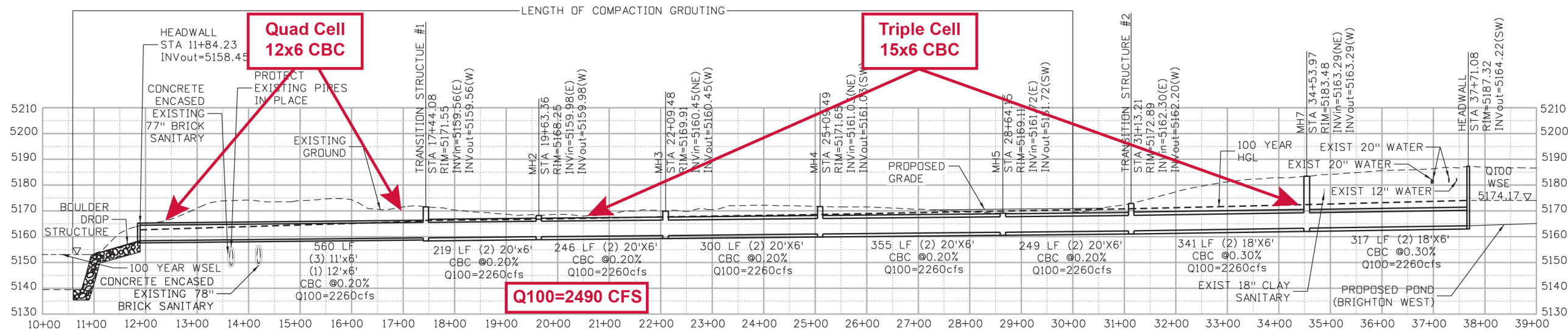
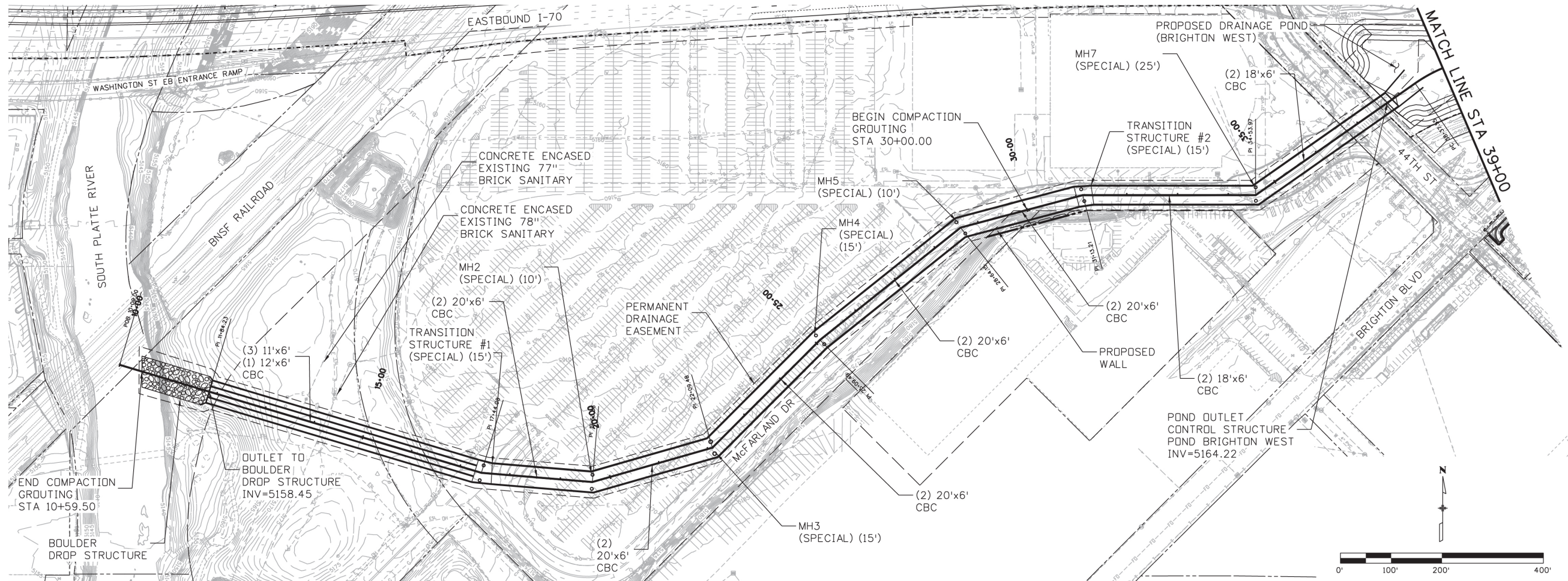
KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10 Section 8.4.9.f of the PA

### b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment C** with tracked changes for the changes in the section listed above.



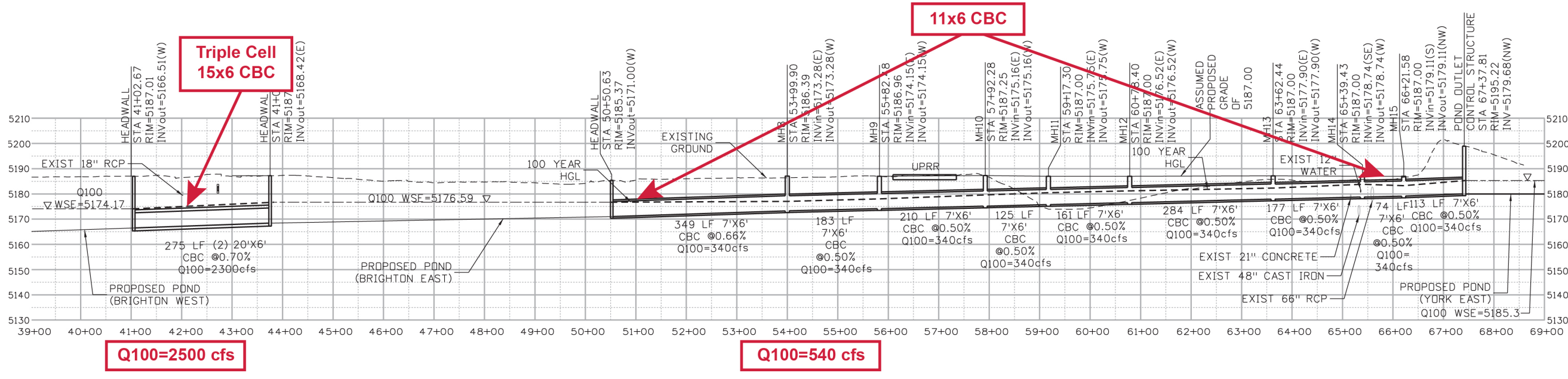
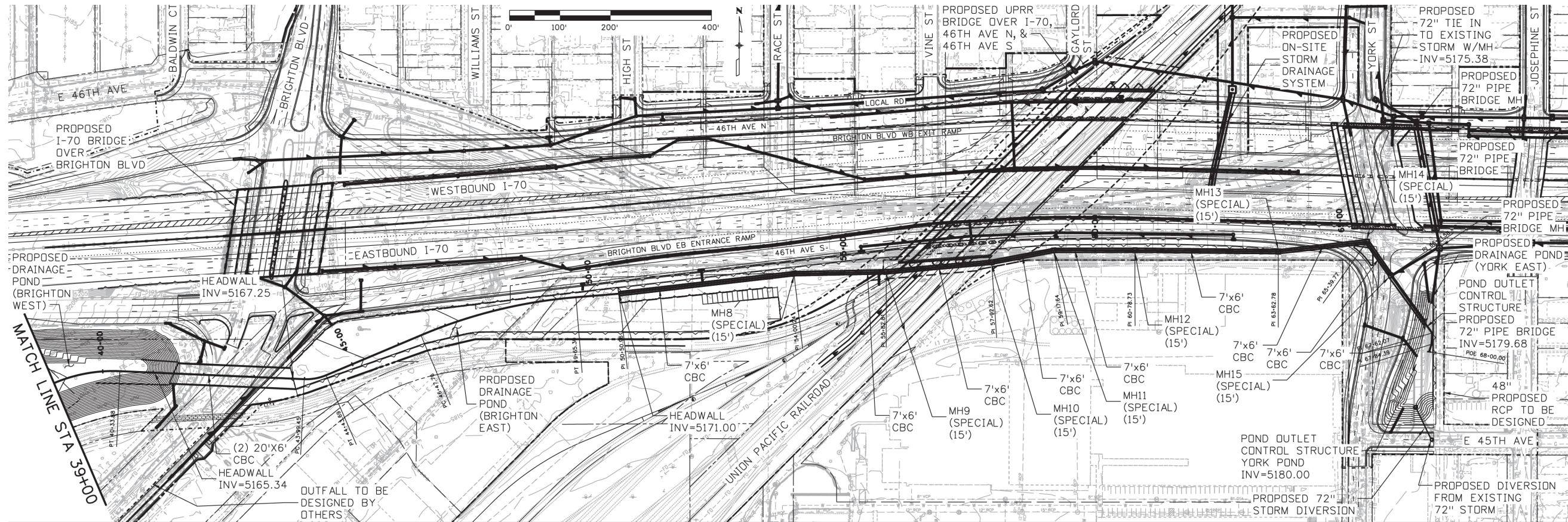


REFERENCE	SECTION	PAGE
B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	3

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT A

ATC NUMBER  
**12.2**  
 SHEET NUMBER 1 OF 3





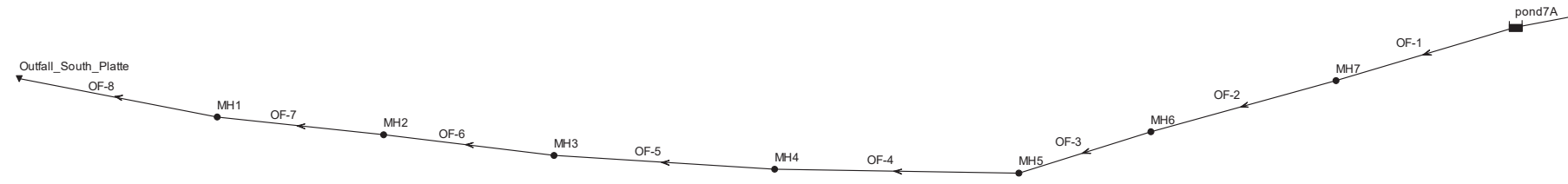
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B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	3

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT A

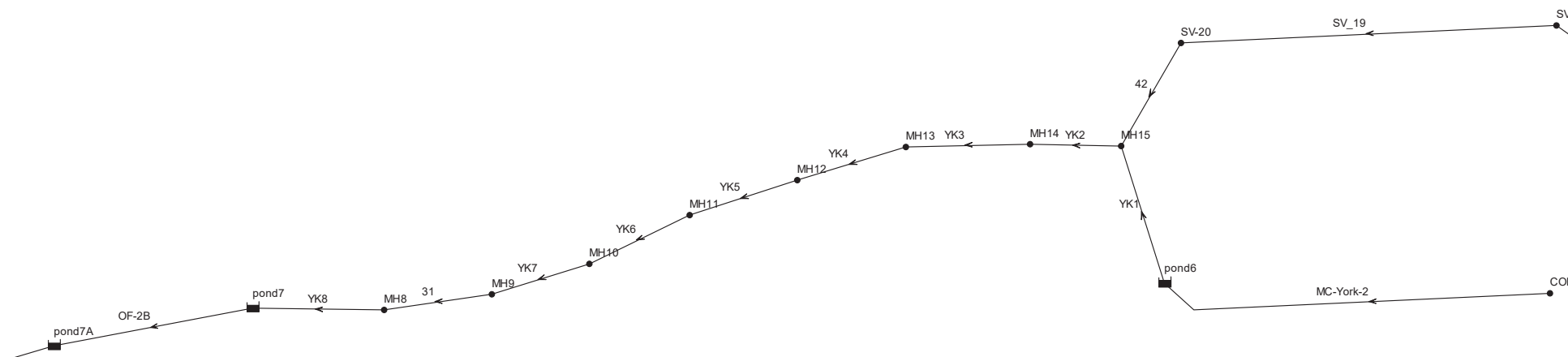
ATC NUMBER  
**12.2**  
 SHEET NUMBER 2 OF 3



**Preliminary Model for CDOT I-70 Offsite outfall with ponds SV - Removal of York St. outfall option**



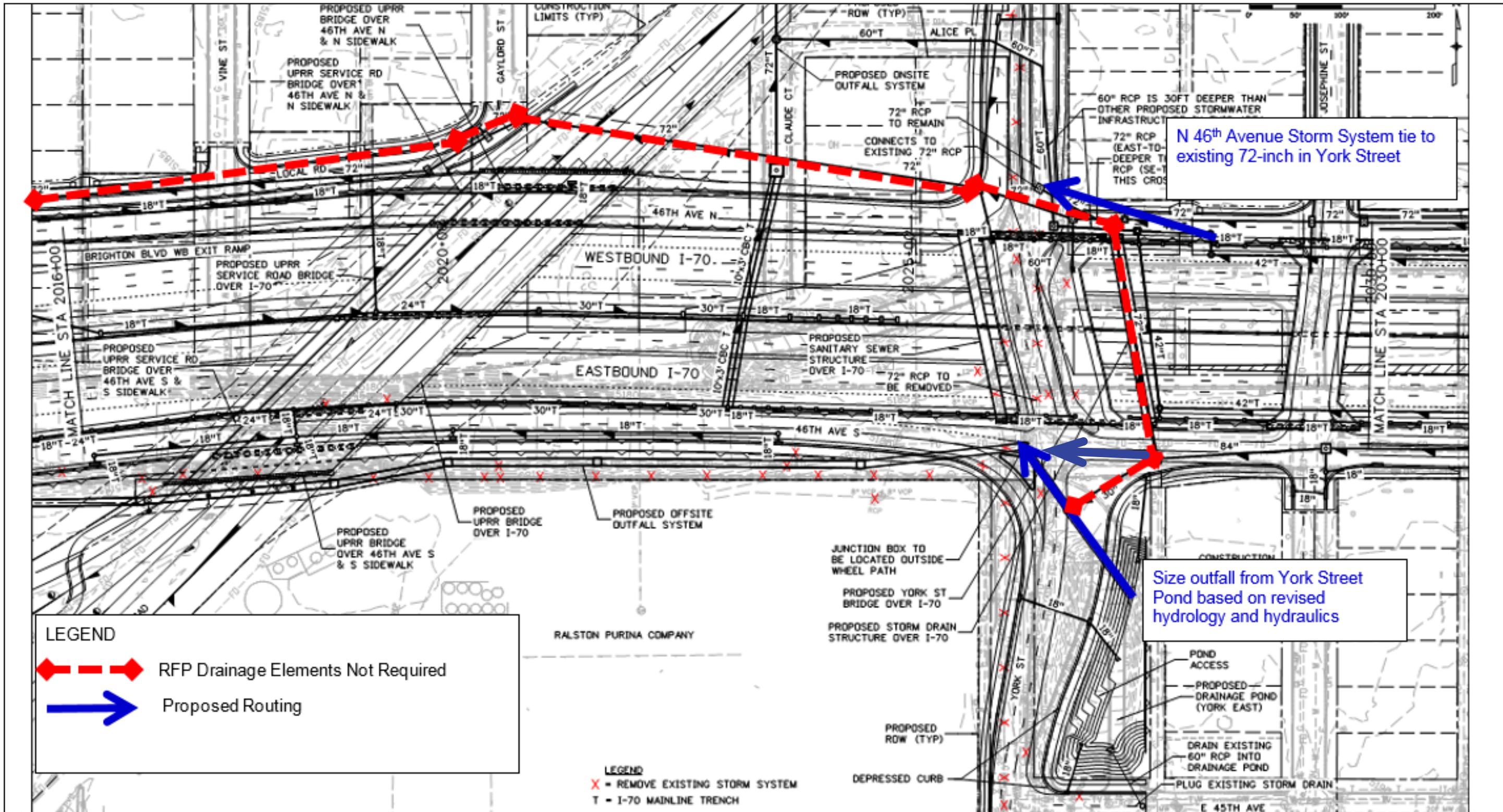
**Preliminary Model for CDOT I-70 Offsite outfall with ponds SV - Removal of York St. outfall option**



REFERENCE	SECTION	PAGE
B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	3

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT A

ATC NUMBER  
**12.2**  
 SHEET NUMBER 3 OF 3



REFERENCE	SECTION	PAGE
B.1	OVERVIEW DESCRIPTION	1
B.7	CONCEPTUAL DWGS	4

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**

ATTACHMENT B

ATC NUMBER  
**12.2**

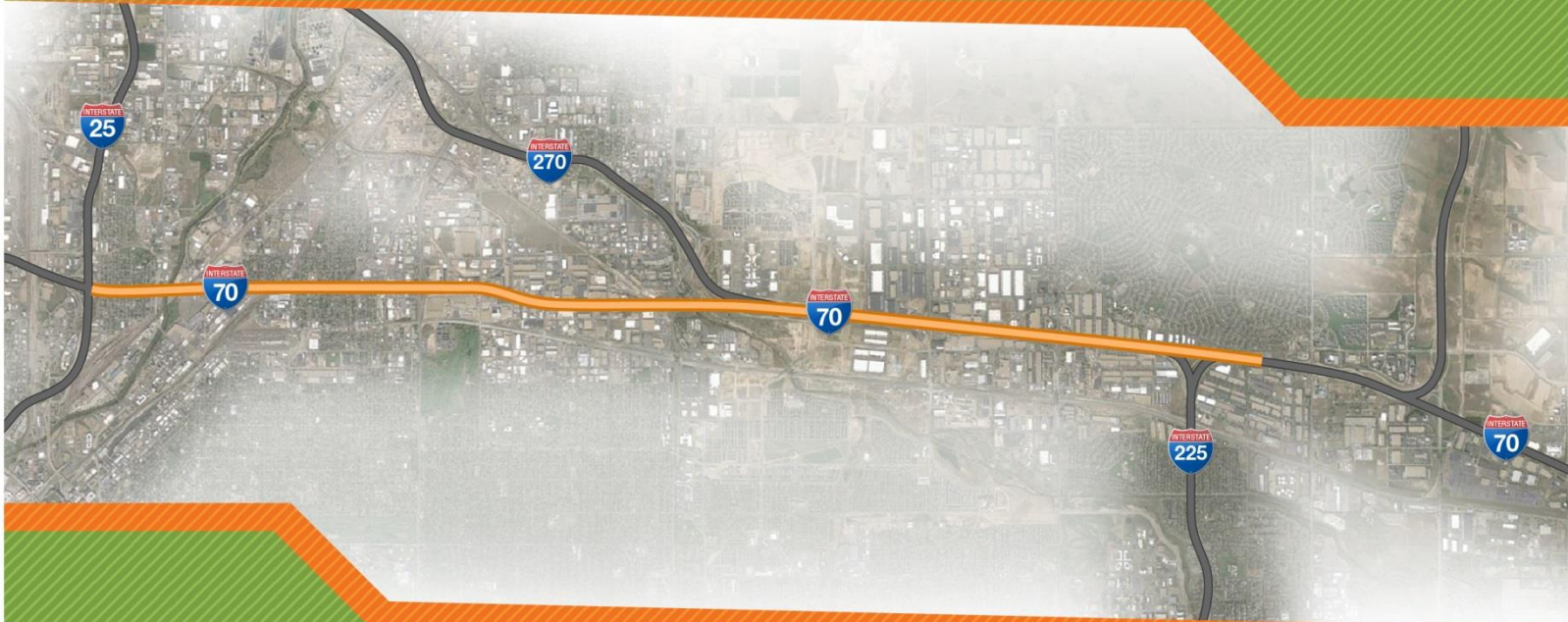
SHEET NUMBER 1 OF 1



# Central 70 Project

Attachment C- Tracked Changes to Section 8 of Schedule 10

ATC 12.2



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016

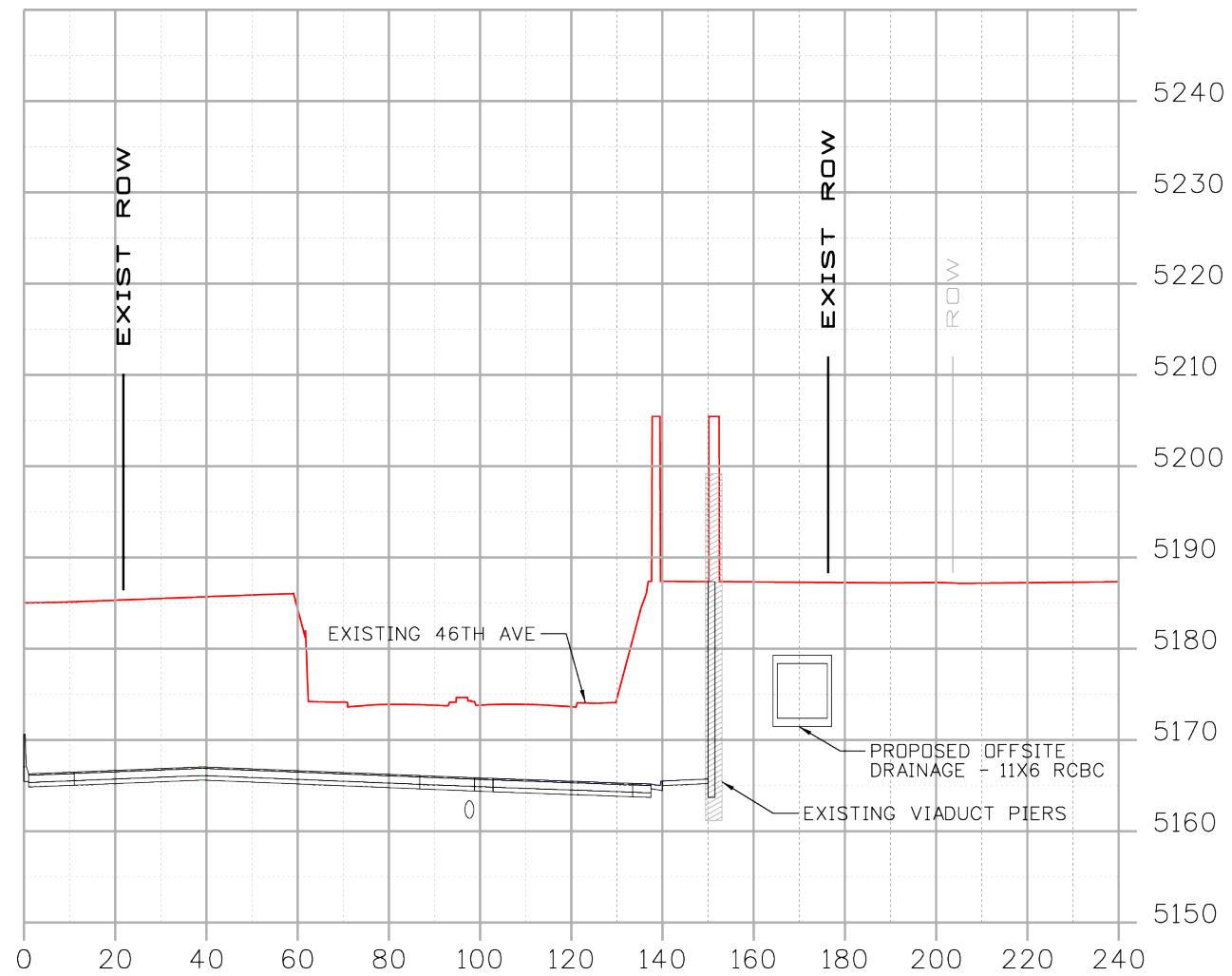


- f. Storm Drain over the Lowered Section near York Street  
The Developer shall continue to utilize the historic flow capacity in the existing storm drain in York Street, north of the I-70 Mainline, ~~with a structure over the Lowered Section.~~
- g. Sand Creek  
The Developer shall design and reconstruct the overflow channel for Sand Creek adjacent to the south side of the I-270 flyover. The Developer shall coordinate with CCD, UDFCD and Local Agency floodplain administrator.
- h. Groundwater  
The Developer shall provide the necessary analysis and design for temporary dewatering during construction and permanent treatment of groundwater for the Site. Additional information regarding groundwater conditions and requirements is included in Schedule 17 Environmental Requirements.
- i. Cover  
The Developer shall design, construct and install the necessary drainage infrastructure required to drain the Cover and protect the Lowered Section between Columbine Street to Clayton Street from the 100 year event. Additional information and requirements regarding the Cover are included in Schedule 10, Section 12 Cover MEP System.
- j. Micro Tunneling and Pipe Jacking  
Micro tunneling or pipe jacking shall be permitted in areas where open cut installation of Storm Drains and Cross Drains is prohibitive. The use of rectangular pipe is prohibited. The Developer shall:
  - i. Consider the use of steel, concrete, or centrifugally cast fiberglass-reinforced, polymer mortar pipe. Pipe material shall be submitted by the Developer to the Department for Acceptance;
  - ii. Submit to the Department, for Acceptance, the materials, means, and methods of installation, including but not limited to the following:
    - A. Plan and profile with all Utilities shown and labeled with appropriate Utility ID number. All clearances between Storm Drains or Cross Drains and Utilities shall be clearly labeled;
    - B. Jack and boring pit locations;
    - C. Excavation Material Management Plan;
    - D. Traffic Control Plan;
    - E. Dewatering Plan; and
    - F. Quality Control Plan.

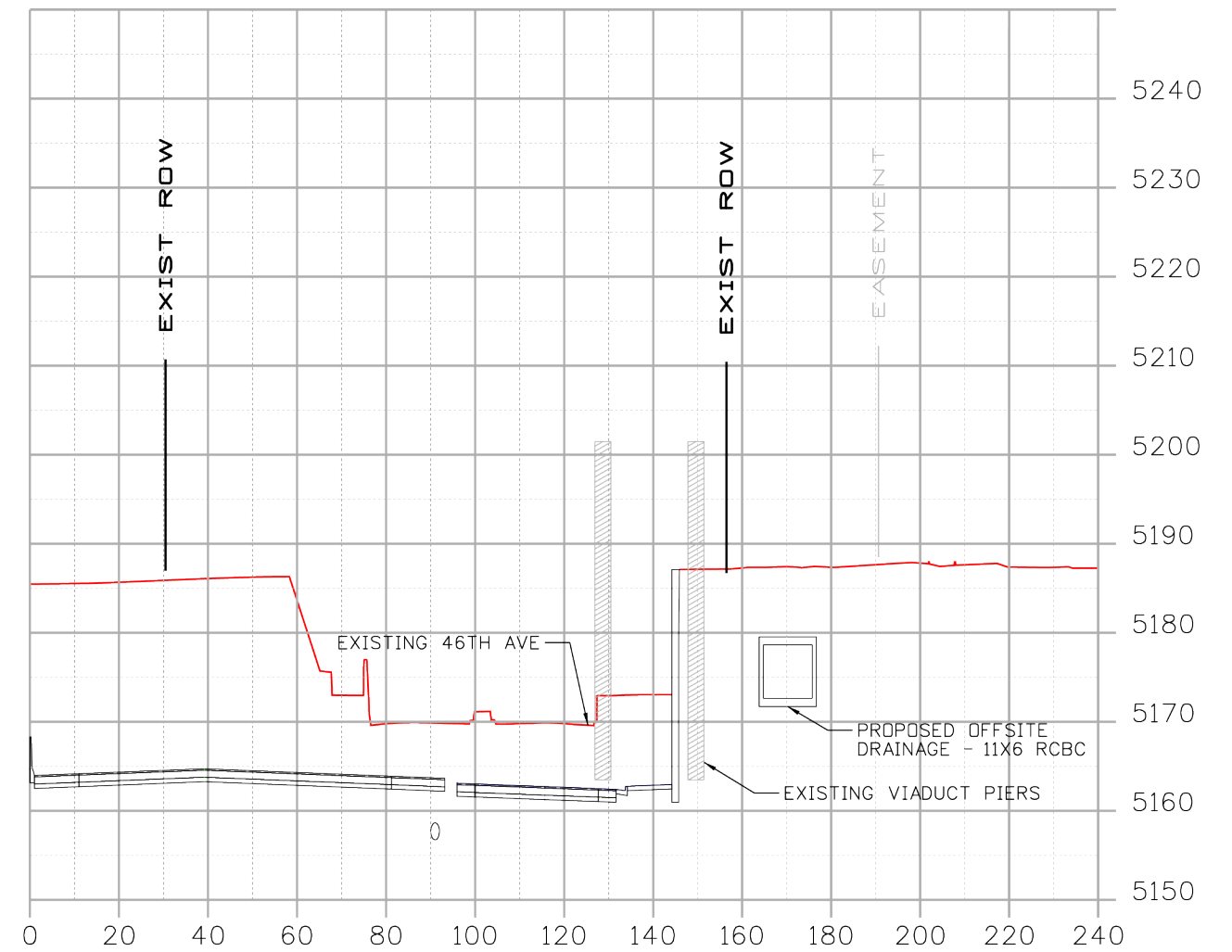
#### **8.5. Construction Requirements**

- 8.5.1. The Developer shall be aware that the Project is within two large existing flood-prone basins; the Montclair Basin and Park Hill Basin. The Developer shall be responsible for protecting and preserving public and private property from damage resulting directly or indirectly from stormwater runoff along or adjacent to the Site during construction of all improvements, including upstream and downstream properties.
- 8.5.2. The Developer is advised to coordinate with Local Agencies, including but not limited to the UDFCD, for flows that affect drainage within the Site. The Developer shall evaluate construction methods and staging during the design phase and include provisions to maintain positive drainage at all times during construction.
- 8.5.3. The Developer shall:





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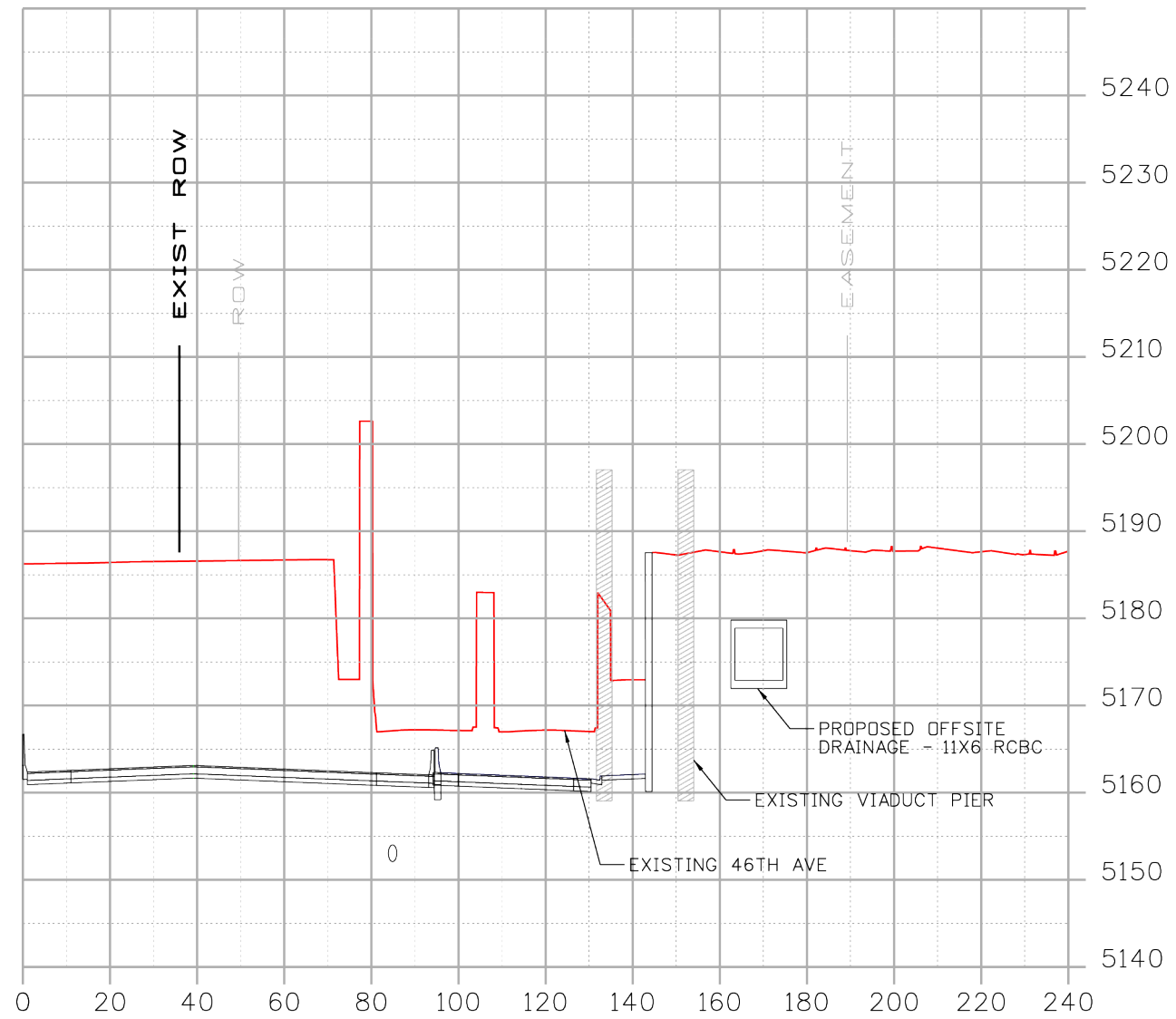
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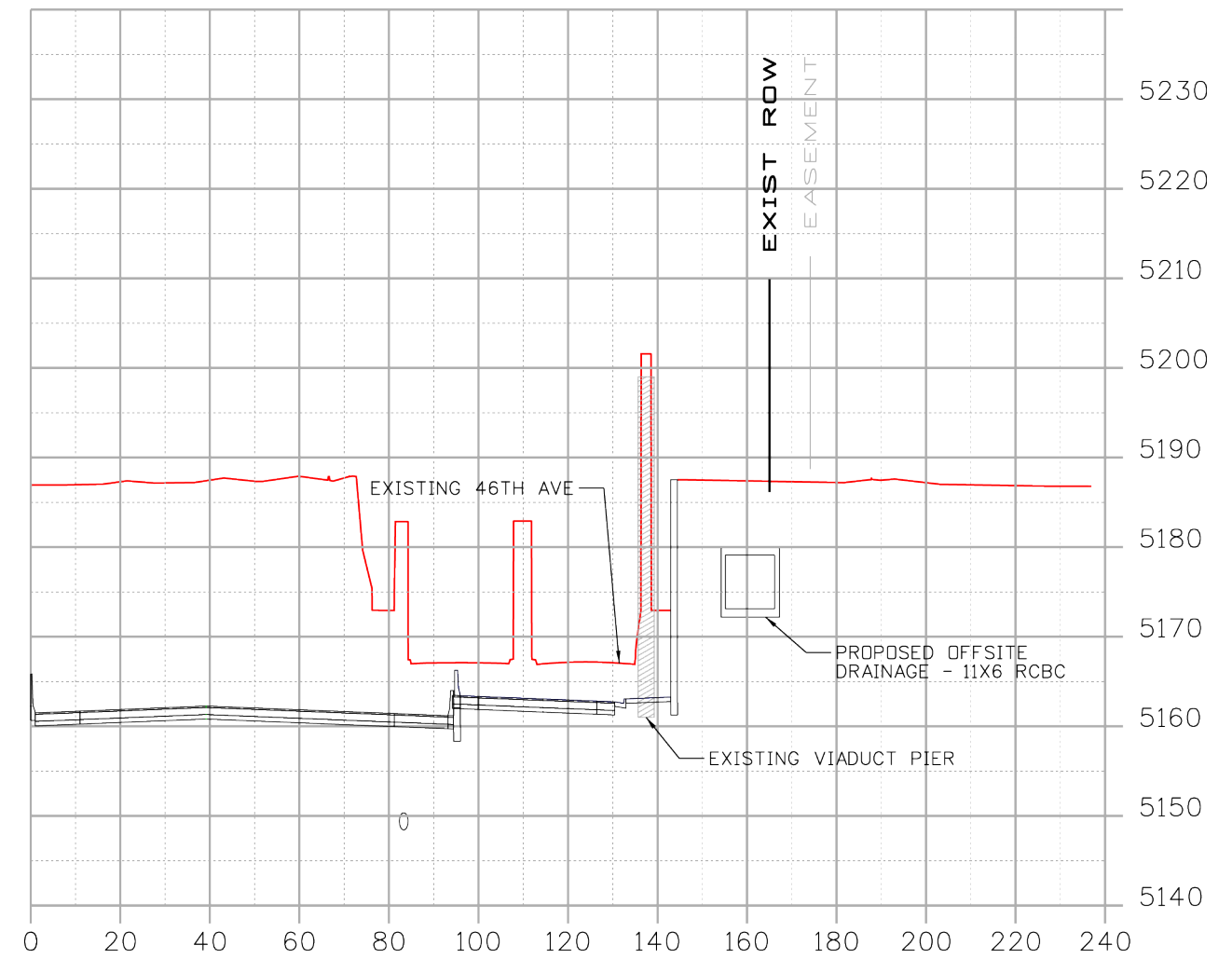
REFERENCE	SECTION	PAGE
B9	ADDITIONAL INFORMATION	4
B7	CONCEPTUAL DRAWINGS	4

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT D

ATC NUMBER  
**12.2**  
 SHEET NUMBER 1 OF 5



STA. 2018+00.0000



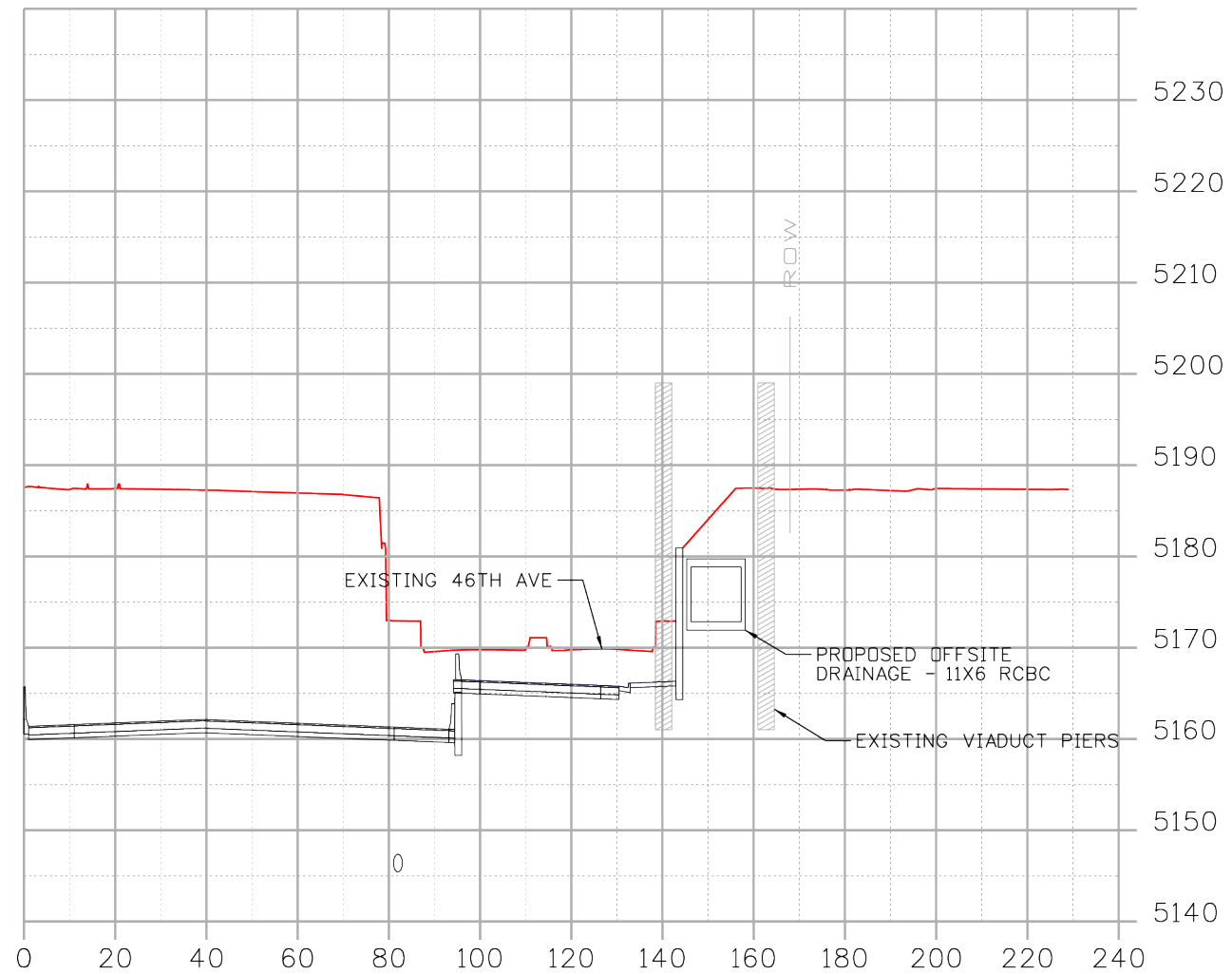
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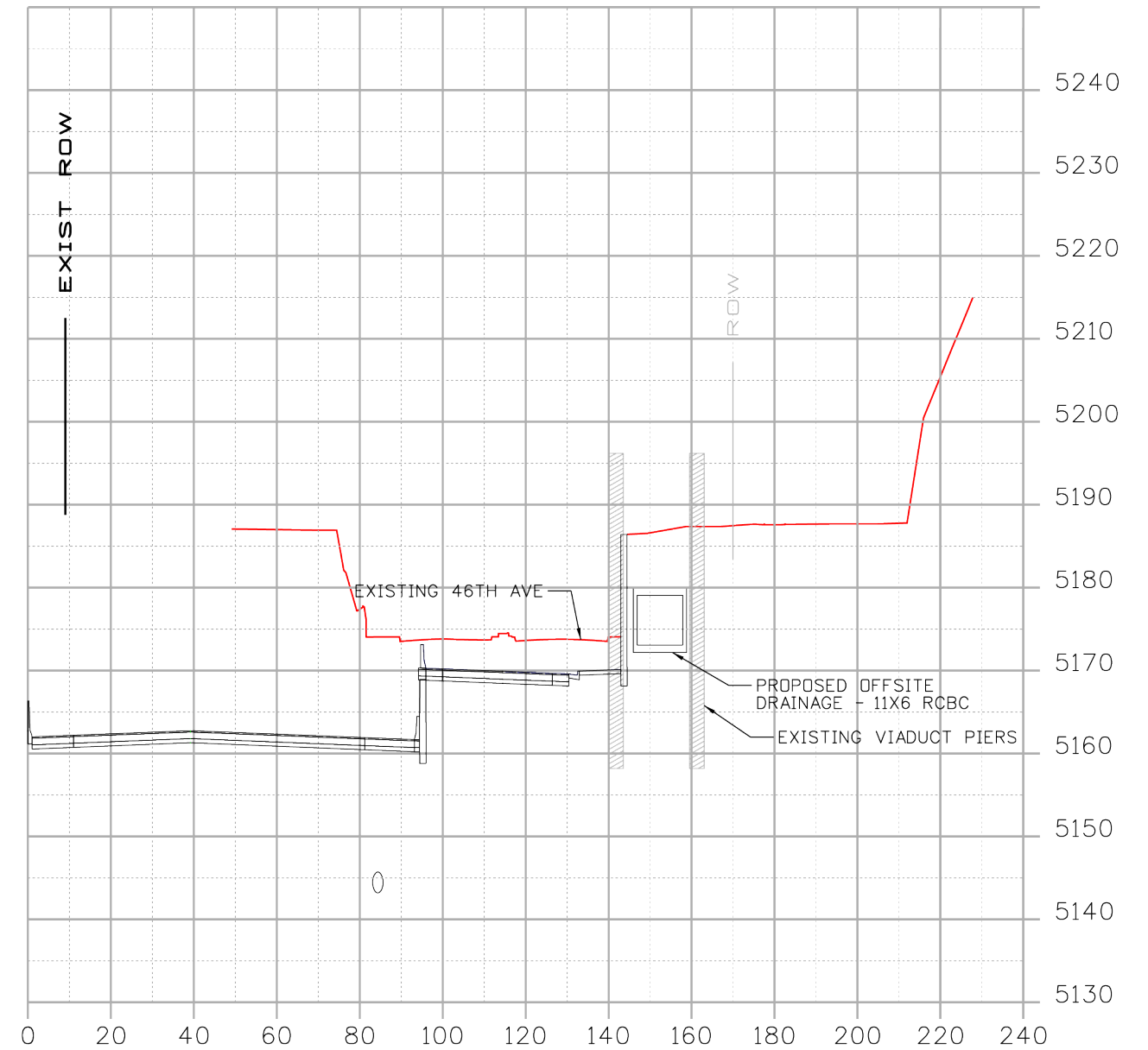
REFERENCE	SECTION	PAGE
B9	ADDITIONAL INFORMATION	4
B7	CONCEPTUAL DRAWINGS	4

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT D

ATC NUMBER  
**12.2**  
 SHEET NUMBER 2 OF 5



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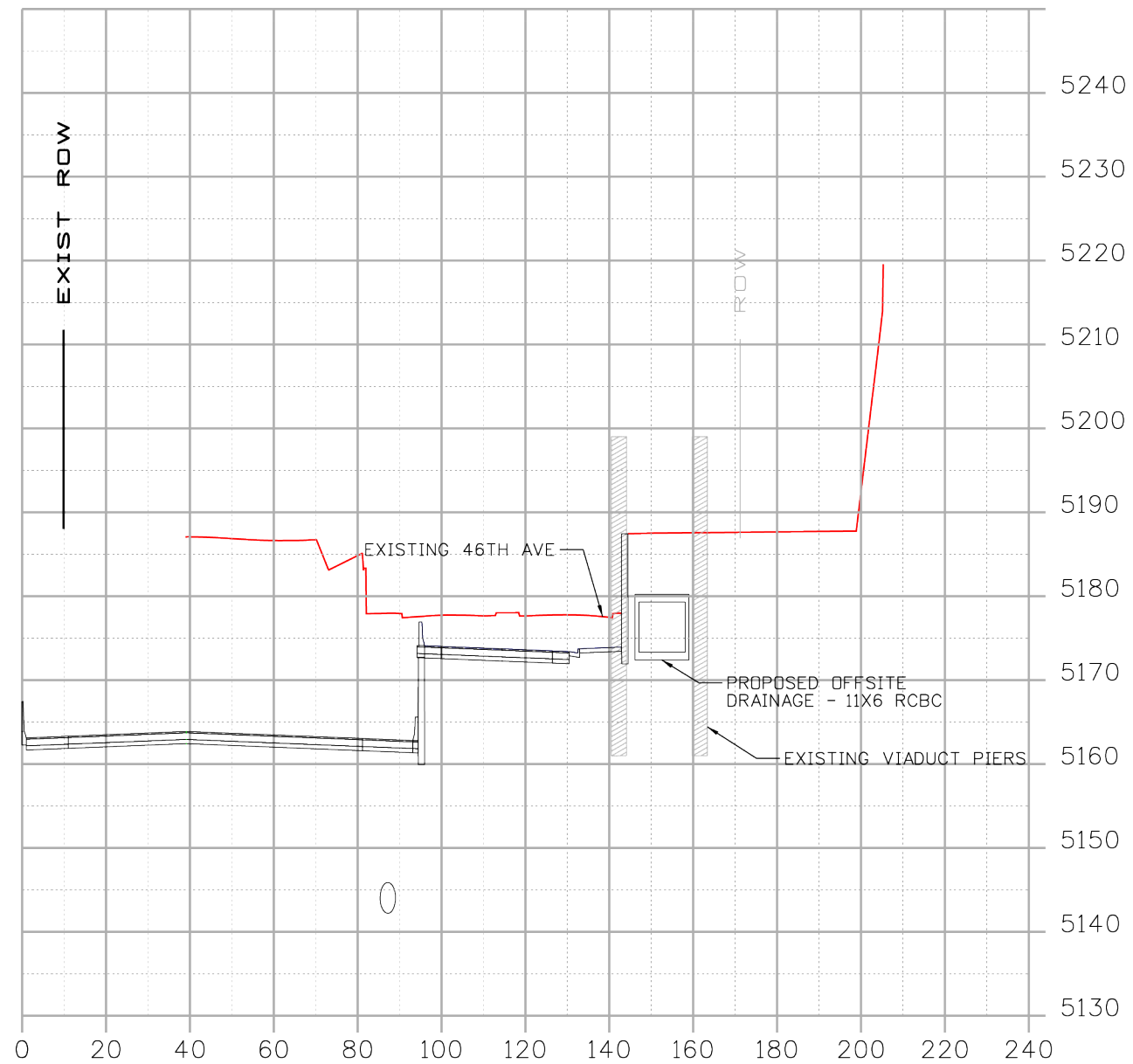
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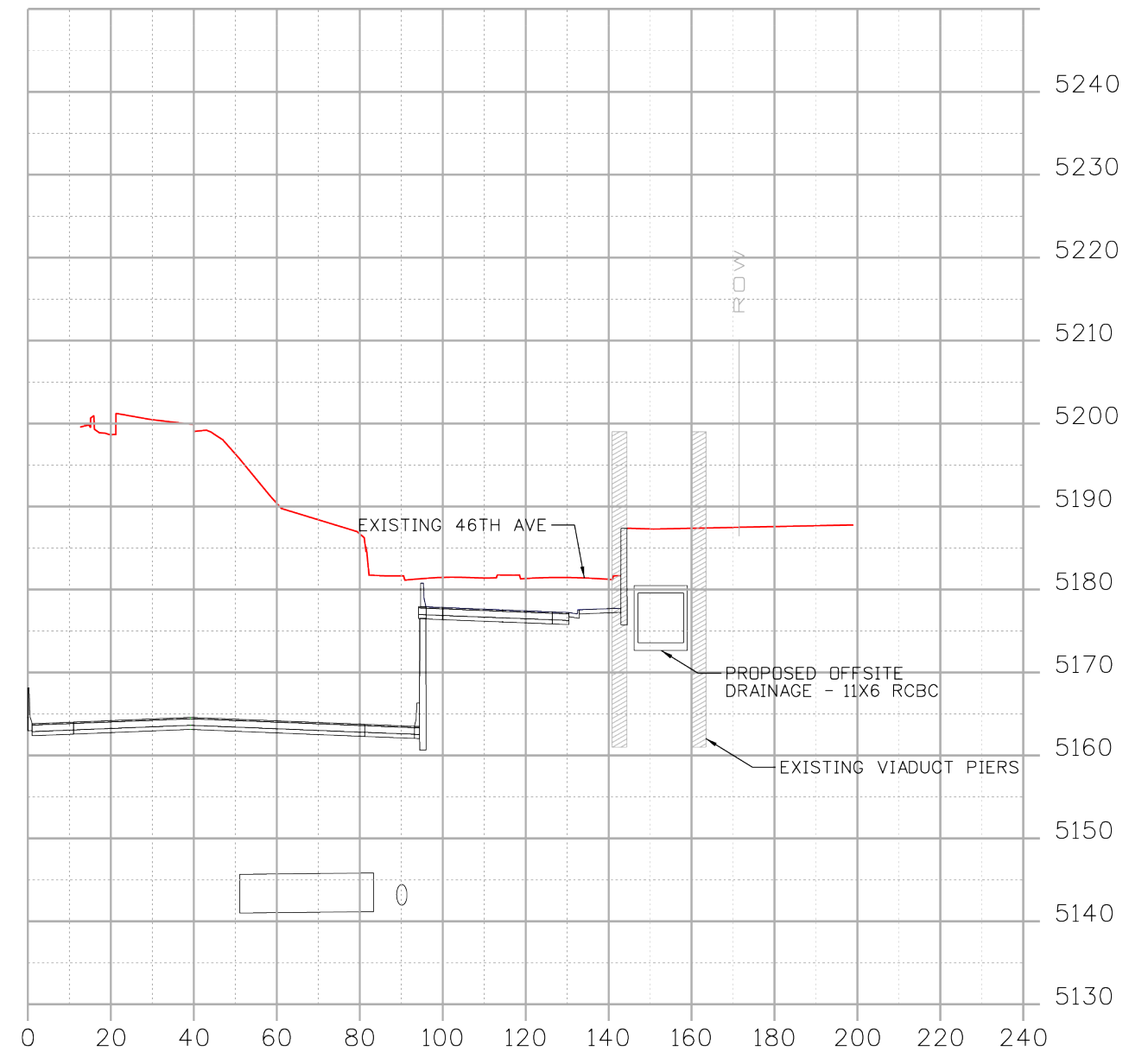
REFERENCE	SECTION	PAGE
B9	ADDITIONAL INFORMATION	4
B7	CONCEPTUAL DRAWINGS	4

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT D

ATC NUMBER  
**12.2**  
 SHEET NUMBER 3 OF 5



STA. 2022+00.0000



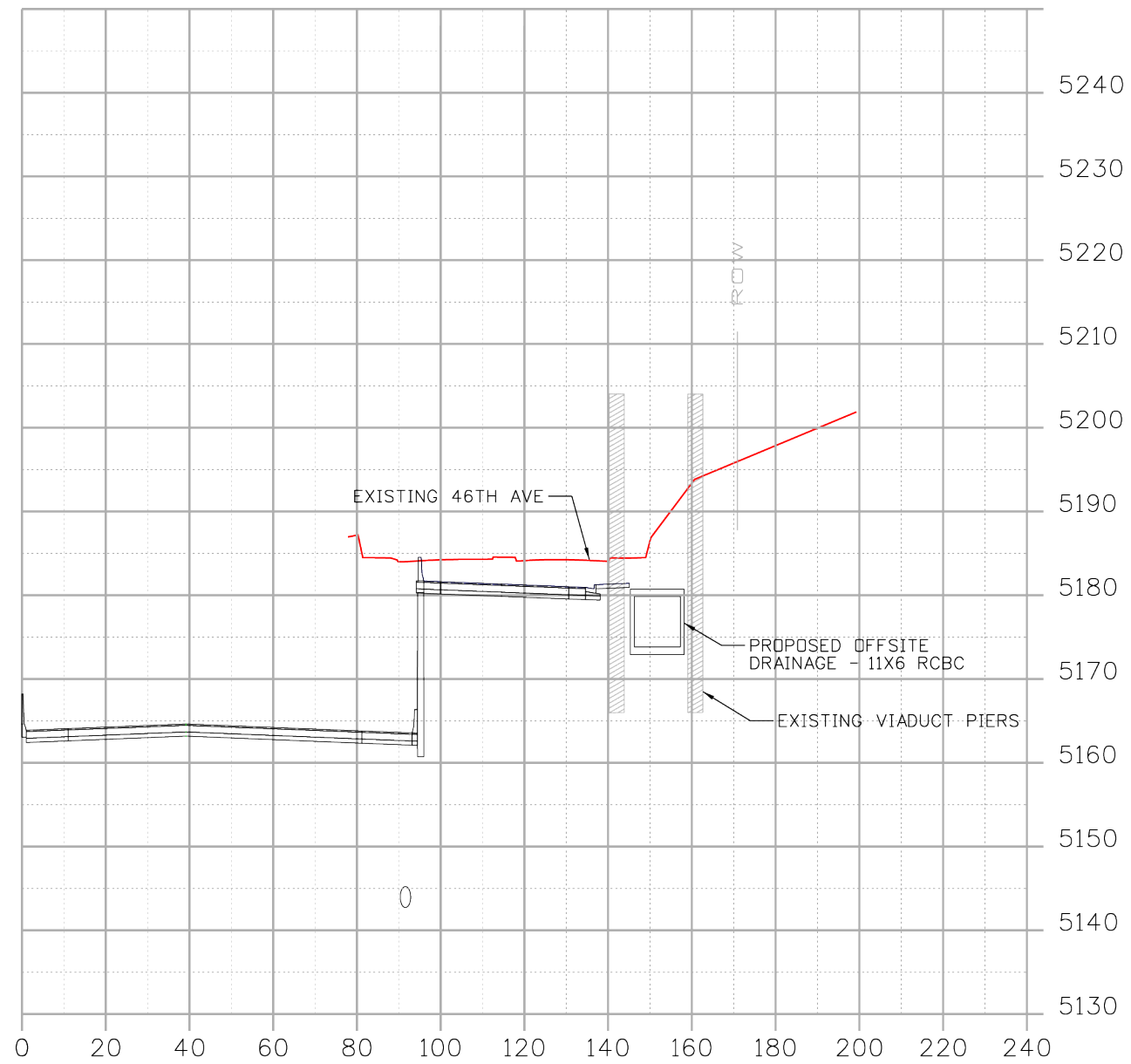
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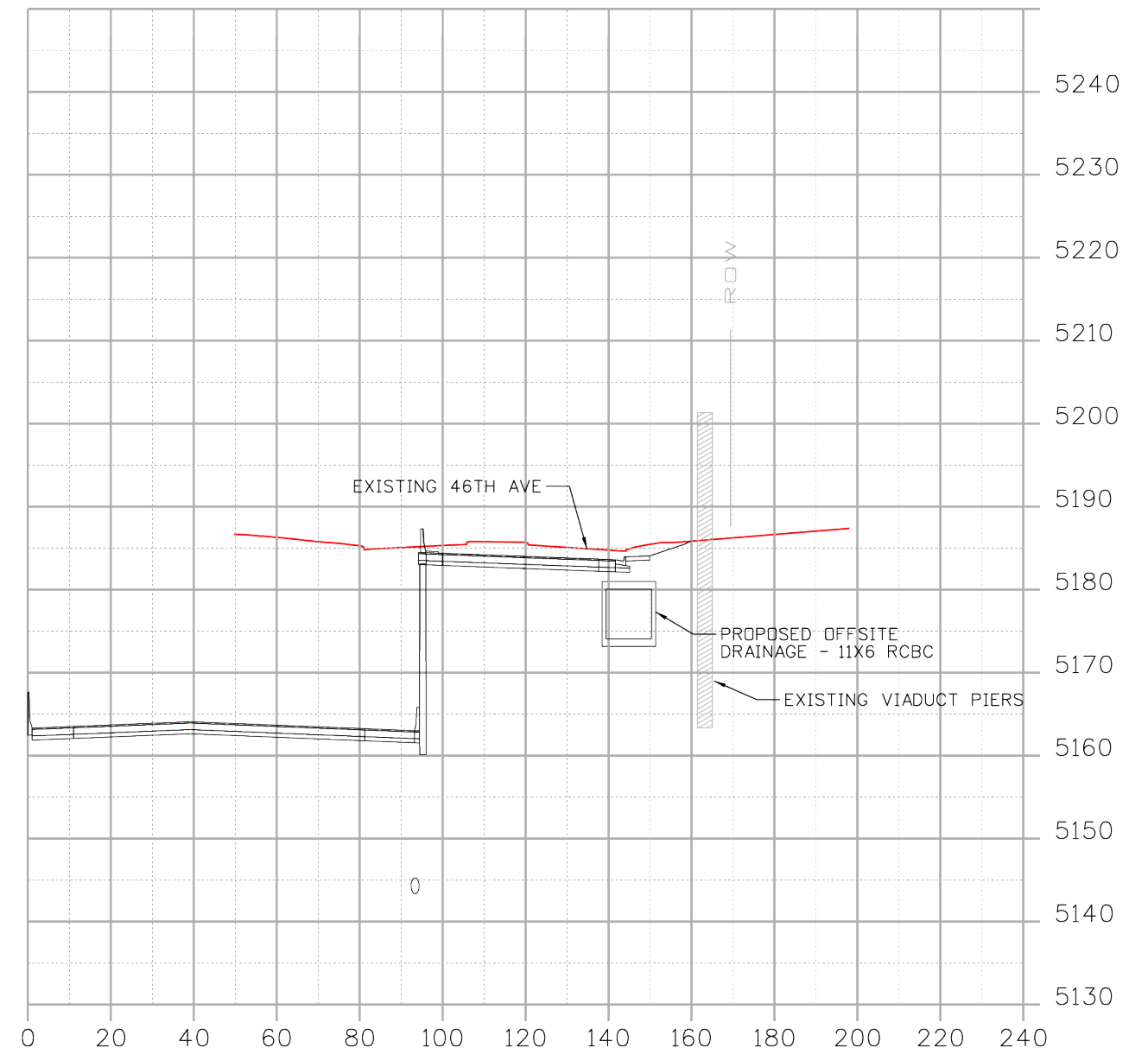
REFERENCE	SECTION	PAGE
B9	ADDITIONAL INFORMATION	4
B7	CONCEPTUAL DRAWINGS	4

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT D

ATC NUMBER  
**12.2**  
 SHEET NUMBER 4 OF 5



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REFERENCE	SECTION	PAGE
B9	ADDITIONAL INFORMATION	4
B7	CONCEPTUAL DRAWINGS	4

ALTERNATIVE TECHNICAL CONCEPT  
**OPTIMIZE OFFSITE DRAINAGE**  
 ATTACHMENT D

ATC NUMBER  
**12.2**  
 SHEET NUMBER 5 OF 5





DATE: August 4, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 14.2

Dear Mr. John Dionisio:

Your Team's ATC Submission Form for Detailed ATC 14.2 has been reviewed by the Procuring Authorities.

Detailed ATC 14.1 proposes to modify the I-70 typical section to allow for independent profiles of WB and EB traffic and shift the axis of rotation/pivot point for superelevation.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

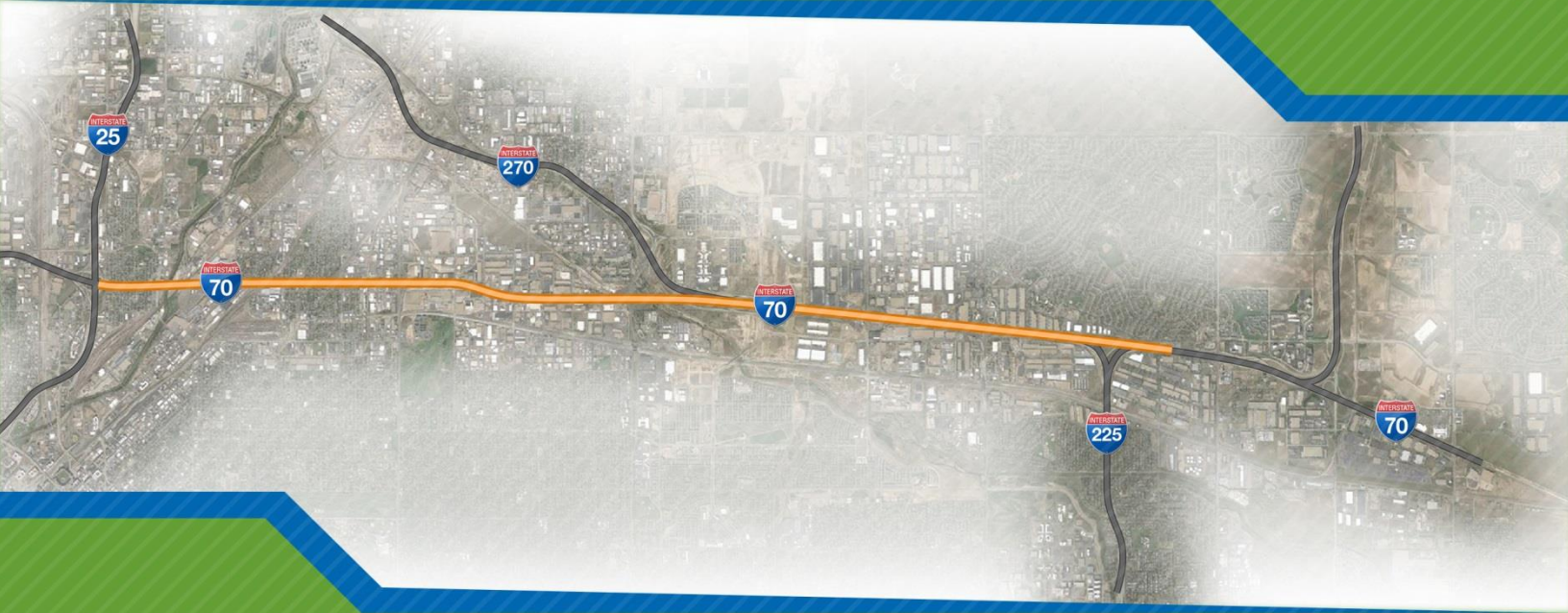




# Central 70 Project

Alternative Technical Concept Submission

ATC 14.2



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 06, 2016

**Central 70 Project RFP: ATC Submission No. 14.2**

### Modified Typical Section

#### A. Background Information

1. Type of Submission

- Conceptual ATC
- Detailed ATC

2. Prior Submission

- None (initial submission of ATC)
- Previously Submitted as Conceptual ATC
- Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions

4. Request for Discussion at One-on-One Meeting

- Meeting Requested
- Meeting Not Requested

#### B. General ATC Submission Requirements

##### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

Kiewit Meridiam Partners (KMP) proposes to modify the I-70 typical section to allow for independent profiles of WB and EB traffic and shift the axis of rotation/pivot point for superelevation. This modification will provide a normal crown pavement section for both WB and EB directional roadways. **Attachment A** shows the typical section as defined by the Project Agreement (PA) and the proposed modified typical section. The modified typical section has been successfully implemented throughout the United States.

##### 2. Relevant RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

### ATC 14.2 Benefits

- ✓ Improves safety by reducing potential for hydroplaning
- ✓ Improves safety by reducing snow thaw/freeze next to median barrier
- ✓ Reduces groundwater impacts by raising pavement elevation
- ✓ Reduces wall quantities
- ✓ Reduces excavation requirements
- ✓ Optimizes storm drain system
- ✓ Provides improved temporary snow storage area next to the median after a large snow event

This ATC requests a modification to the Schedule 10, Section 9.2.b of the PA which states “Conform to the Roadway Typical Sections as provided in Schedule 10B Contract Drawings.” Contract Drawings Schedule 10B Section 10B.10.9.01 Roadway Typical Sections of the PA show normal crown at the I-70 centerline with a 2% cross-slope from the median barrier sloping downward to the outside shoulder in each direction of travel. The modified typical section presented in this ATC deviates from Schedule 10B Contract drawings and also deviates from the CDOT Standard Plan M-203-11 Superelevation Crowned and Divided Highways, which shows the superelevation pivot at either the center point or the inside shoulder.

Contract Drawings Schedule 10.B Section 10B.10.13.01 Structure Typical Sections of the PA will also be updated to reflect the modified typical section cross slopes.

### 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC. The inside shoulder width has been changed to take into account the approved Design Exceptions and additional clarifications are included.

The modified typical section would be utilized for the length of the full reconstruction of I-70 from Brighton Blvd. to Sand Creek. This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public**
  - **Reduces the likelihood of icy patches on the roadway:** This ATC will result in less sheet flow water which will reduce the likelihood of snow melt refreezing across the travel lanes.
- **Optimize the Scope**
  - **Reduces the height of the retaining walls and excavation required through the Lowered Section:** With the modified typical section, the outside edge of pavement is approximately 10 in. higher than the PA typical section due to the shift of the crown point to the outside edge of the buffer.
  - **Reduces the number of catch basins required by approximately 25%:** The modified typical section diverts nearly half of the storm water towards the median where a wider 10 ft. inside shoulder, versus a 6 ft. outside shoulder, is available for spread. The number of catch basins required on the outside is reduced by half, and the median catch basins are spaced further apart.
- **Optimize Operating and Life Cycle Maintenance Costs:**
  - **Lowers snow and ice control service costs:** The application of liquid and solid deicers and anti-icers is reduced due to the thaw/freeze of snow remaining next to the median barrier. This thaw/freeze cycle is a common and prolonged issue for roadways located in canyons where the barriers are shaded; the tall cut retaining walls of the Lowered Section will create a similar environment.
  - **Reduces O&M costs:** O&M costs are reduced because of the reduced number of catch basins requiring cleaning. Continued savings will also be realized by Department after Handback.
- **Minimize Impacts to the Travelling Public, Businesses and nearby Communities:**
  - **Reduced construction traffic:** The reduction in quantities of retaining walls, excavations, and catch basins will reduce construction related truck traffic on the

I-70 mainline and local roadways which will reduce traffic impacts. This will also assist in decreasing the emissions associated with the Project.

- **Reduced snow and ice maintenance:** The reduction in applications of deicers, anti-icers, and snow plowing will also reduce construction related truck traffic and emissions.
- **Ensure Reliable Travel Speeds:**
  - **Reduces the depth of sheet flow storm water across the outside travel lanes:** The outside general purpose lanes typically carry more traffic than the inside managed lanes. Lessening the depth of sheet flow in the outside lanes will improve operations and safety.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC. Further clarifications have been included.

No long term adverse impacts will result from implementation of this ATC. The 4% grade-break in cross-slope located at the outside edge of the buffer and the general purpose lanes is within allowable tolerances in the AASHTO “Green Book”, and has been implemented in Utah along I-15.

The safety of the travelling public is enhanced by reducing the likelihood of hydroplaning. The modified roadway typical section creates a highpoint at the outside edge of the buffer, resulting in the width of pavement draining to the outside being reduced by nearly half. This results in an equivalent adjustment to the depth of sheet flow across the pavement during a storm event. The reduced depth of sheet flow on the pavement allows for better friction between tires and the roadway pavement thus reducing the likelihood of hydroplaning.

The modified roadway typical section also reduces the potential for icy road conditions by eliminating the potential for snow melt from the median to cross into the travel lanes and refreeze. Safety for the travelling public will be enhanced and environmental impacts will be reduced due to the minimized application of liquid and solid deicers and anti-icers. This is especially relevant for the Lowered Section where snow and icing conditions are likely to remain for a longer duration since pavement will be in the shadow of the retaining walls.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

ATC 14 reduces the project costs by approximately \$1.1 million.

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

The construction schedule will be expedited by reducing the exposed height of the retaining walls, reducing the required number of catch basins, and reducing the amount of excavation to be hauled out of the cut section. Allowing independent profiles for WB and EB corridors will keep the proposed pavement elevations closer to the existing pavement, which reduces the fill required and improves the maintenance of traffic phasing.



## 7. Conceptual Drawings

This information ***has been*** amended since the submission of the previous version of this ATC adding Attachment D to address the Procuring Authorities comments in response to Detailed ATC No. 14.1.

**Attachment A** presents the PA and the proposed modified roadway typical sections. Both typical sections have been updated to incorporate the design exceptions provided in the PA for narrowed inside shoulder widths. Changes to the Attachment are shown in red.

**Attachment B** presents the typical MOT Sections.

**Attachment C** presents the changes required to Schedule 10B of the PA.

**Attachment D** presents glare screen barrier effectiveness for various design vehicle headlight projections.

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

The modified typical section has been successfully implemented throughout the United States and is the UDOT standard typical section for interstates with more than three lanes in each direction. UDOT has implemented this typical section for a majority of I-15 along the Wasatch Front from Provo to Ogden. UDOT prefers this typical section due to improved safety conditions and ease of maintenance. This typical section improves roadway drainage and reduces the potential for hydroplaning. It also eliminated the potential for snow in the median to melt across the travel lanes and then freeze.

## 9. Additional Information

This information ***has been*** amended since the submission of the previous version of this ATC to address the Procuring Authorities comments in response to Detailed ATC No. 14.1.

### **ATC No. 14.0 Comment #1**

*Provide additional detail on how the proposed typical section will function during construction phasing and maintenance of traffic operations (i.e. location of crown in relation to wheel paths, compatibility of typical section and superelevation with crossovers, location and number of inlets related to wheel paths).*

**KMP Response: Attachment B** shows the typical section layout of KMP's current MOT design in the Lowered Section between Brighton Blvd. and Colorado Blvd. The phasing is such that KMP will construct the WB lanes of I-70 and shift mainline traffic onto the newly constructed pavement. Traffic will run in a head-to-head configuration separated by barrier to facilitate the demolition of the viaduct and construction of the new EB I-70 lanes. The example cross section demonstrates KMP's current MOT phasing concept in relation to the proposed crown point. Through the Lowered Section, the temporary lane configuration does not locate a wheel path on the proposed crown point of the modified typical section.

The outside shoulder for WB traffic will meet or exceed an 8 ft. width and emergency pullouts will not be required in the WB direction of travel. This WB outside shoulder will vary from 9 ft. to

15 ft. in width dependent on the locations of the permanent auxiliary lanes. This eliminates the wheel path from running over the WB outside shoulder inlets during construction phasing.

By providing a variable width WB outside shoulder, the EB inside lane line will coincide with the crown point of the proposed modified typical section. This configuration prevents the EB traffic from crossing over the crown point through the Lowered Section. For EB traffic, the outside shoulder will vary from 3 ft. at bridge columns to 5 ft. in width through the normal roadway section. Emergency pullout locations have been preliminarily located to satisfy the PA requirements. This eliminates the wheel path from running over the WB inside shoulder (median) inlets during construction phasing, except potentially during use of the emergency pullout. Through the Cover, there will be several instances where the lane line crosses the edge of an inlet, but the designed wheel paths will not be over the grate.

KMP's MOT phasing plan for the above-grade section of I-70 between Colorado Blvd. and Sand Creek is still being developed and evaluated. Due to the constrained right-of-way, it is expected to have narrow 2 ft. outside shoulders with emergency pullouts for both travel directions. In all typical MOT layouts (excluding crossover locations), KMP will not place a temporary lane configuration where a wheel path lands on proposed crown point unless there is no other viable option. Regardless of the cross section, standard normal crown section or modified crown typical section, both will likely have temporary traffic running on catch basin inlets due to narrow 2 ft. outside shoulders during construction. Since there are fewer overall inlets required with the proposed modified typical section less inlets will be driven over as a result of this ATC.

Crossovers locations have not yet been fully designed so the number of inlets potentially to be driven over is not yet determined. Concerted effort will be made to locate crossovers in locations that minimize traffic impacts. Crossover transition design will be similar to MOT crossovers on similar construction projects. Crossovers transitioning over the modified crown point are the same as transition crossovers over the centerline of a normal crown typical section. This occurs on most highway projects of a similar nature.

For any catch basin inlet that KMP expects traffic to drive over, the grate will be physically attached to the catch basin frame either through a bolted system or temporary welds. These methods have been successfully used by KMP's lead contractor, Kiewit, on numerous other projects throughout the United States including Utah, which utilizes the modified typical section. The inlets will be closely monitored during the temporary phasing periods when traffic is running on them; a detailed inspection and any necessary repairs will be done after phasing takes traffic off of the grates.

## **ATC No. 14.1 Comment #1**

*The Department would like additional information regarding the impact of ATC 14.1 on the effectiveness of the glare screen that is required to be installed on top of the median barrier. The Department asks that KMP resubmit Detailed ATC 14.1 with an analysis of the effectiveness of the glare screen given that the top elevation of the screen will be lowered by implementing this ATC.*

**KMP Response:** KMP has reviewed applicable roadway design standards and guidelines, automobile standards, and numerous research papers to analyze the effectiveness of the PA median barrier glare screen used in conjunction with our proposed modified roadway typical section. KMP's review of the various documents did not find a roadway design equation to directly calculate glare screen height that would allow KMP to analyze the effectiveness of the

proposed glare screen layout. However, as referenced below, research papers and standards were able to provide relevant background information including the average height of vehicle headlamps, headlamp aiming specifications, and effects of roadway geometry on glare. KMP used this information to develop the visual representations of various vehicles types and the standardized headlight projections as presented in **Attachment D**. This analysis demonstrates that the CDOT 52" Concrete Glare Screen will effectively block opposing traffic vehicle headlight glare for a vast majority of vehicles.

## Background Information

The TRB National Cooperative Highway Research Synthesis of Highway Practice No. 66: *Glare Screen Guidelines* (Sivek et al. 1979) is the principal study referenced in AASHTO design guidelines and nearly all subsequent research papers related to the effects of headlight glare. At the time that the paper was written, it assumed height of headlamp of 24 in. and height of driver's eye of 45 in". Three conclusions were provided (Sivek et al. 1979) for the recommended glare screen heights:

- Cutoff angle
  - This recommendation is not applicable to Type I glare screens which are continuous opaque glare screen (including concrete glare screen as specified in the PA).
- Height – normal 50 in., sag curves up to 80 in.
  - KMP is proposing to use the CDOT standard median barrier glare screen of 52 in. height which exceeds the recommended 50 in. height. For sag curves, Sivek et al. (1979) recommends increasing the height of the glare screen up to 80 inches, but recognizes that many jurisdictions do not attempt to provide for screening in the larger sag verticals. The paper stated the height in sag locations could be calculated using the Virginia Department of Highways and Transportation program or by "eyeballing" the installation in the field. A review of the VDOT roadway design manual and standard plans did not find any glare screen height calculation program and their standard glare screen barrier height is 50", 2" less than the CDOT standard. KMP's roadway design team has never designed a taller glare screen height due to sag vertical curves on any past project in the United States. Standard industry practice is to use the state standard for median glare screen as KMP is proposing.
- Width of median – 20 feet or less
  - The minimum median width as specified in the PA is 22 feet (two 10 ft. shoulders and a 2 foot wide median barrier). The proposed median width exceeds the recommended minimum median width for roadways without glare screen.

Recent research papers recognize that there have been changes to automobile design since the paper was published in 1979 including the height of the driver's eye, height of headlamps, and the design and type of headlamps. The design height of the driver's eye has been lowered to 42 in. from 45 in. for a typical passenger vehicle. The lower 42 in. height of driver's eye is used in AASHTO to provide a more conservative stopping sight distance. The other significant difference is that the average height of vehicle (and correspondingly the height of headlamps) has increased since 1979 with a much higher percentage of LTR's (light trucks, SUVs, vans, etc.) rising from 10% in 1979 to nearly 50% today. A more recent research paper, *The Locations of Headlamps and Driver Eye Positions in Vehicles Sold in the U.S.A* (Sivek et al. 1996) determined the average height of headlamps for cars and light trucks/vans as shown in Table 1.

KMP measured trucks and SUVs for a random, unscientific sample to verify that this height of headlamp is consistent on vehicles that are newer than 1997.

*Table 1: Average height of headlamps for cars and light trucks/vans*

Vehicle Type	Height of Headlamp (in)	Height of Driver's Eye (in)
Cars	24.4	43.7
Light Trucks and Vans*	32.7	55.9

\* Based on typical classifications, SUV's would be included.

This same paper provided assumed average height of headlamps and driver's eye for other vehicles based on previous studies as shown in Table 2.

*Table 2: Average height of headlamps and driver's eye for other vehicles*

Vehicle Type	Height of Headlamp (in)	Height of Driver's Eye (in)
Motorcycle	31.5	39.4
Large Bus	33.5	85.4
Heavy Truck	33.5	91.7

The United States automobile industry is regulated on headlamp height and aim inspection limits as set forth in SAE J599 - *Lighting Inspection Code*. All vehicles must have the low-beam center of headlamps located between 22 in. and 54 in. above the ground. The nominal vertical aim (top edge of high intensity zone) and aim inspection limits for low-beam headlamps are provided in Table 3.

*Table 3: Nominal vertical aim and aim inspection limits for low-beam headlamps*

Headlamp (centerline) Mounting Height	Nominal Vertical Aim	Aim Inspection Limits for Vertical Aim
22 in. to 36 in.	0 Vertical	4 in. Up to 4 in. Down
36 in. to 48 in.	2 in. Down	2 in. Up to 6 in. Down
48 in. to 54 in.	4 in. Down	1.5 in. Up to 6.5 in. Down

### Visual Representations of Glare Screen Effectiveness

**Attachment D** provides visual representations of cars (Figure 1), light trucks (Figure 2), light trucks with lift (Figure 3), and 48 in. maximum height of headlamp (Figure 4) that opposing traffic headlights would be blocked by the CDOT glare screen in conjunction with our proposed roadway typical section. Each of these Figures shows both the nominal vertical aim for the top edge of the high intensity light zone and the highest acceptable aim inspection limits.

Typical buses and heavy truck headlamps heights are significantly lower than the max height shown in Figure 4. In addition, even light trucks with "lift kits" have headlamps approximately 6 in. lower than the max shown in Figure 4. A premium "lift kit" will raise the body of the truck approximately 6 in. and allow tires up to 6 in. greater diameter providing an overall headlamp rise of 9 in. This results in a calculated headlamp height of approximately 42 in.

Figures 1-4 demonstrate that the vast majority of vehicles on the road today would have their headlights effectively blocked.

## C. Detailed ATC Requirements

### 1. Risks

This information *has not been* amended since the submission of the previous version of this ATC.

There are no risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

This information *has not been* amended since the submission of the previous version of this ATC.

There are no changes in handback procedures and/or the Handback Requirements associated with implementation of this ATC.

### 3. Right-of-Way

This information *has not been* amended since the submission of the previous version of this ATC.

No additional right-of-way is expected to be required to implement this ATC.

### 4. List of Required Approvals

This information *has not been* amended since the submission of the previous version of this ATC.

No new approvals are expected to be required to implement this ATC.

### 5. Proposed Drafting Revisions

This information *has not been* amended since the submission of the previous version of this ATC.

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests the following sections be revised for the exclusive use by KMP upon acceptance of this ATC.

- Schedule 10B (Contract Drawings) of the Project Agreement
  1. Section 10B.10.9.01
  2. Section 10B.10.13.01

Inside shoulder widths requirements have not been modified, KMP assumes that narrower widths will be allowed per approved Design Exceptions 2 and 3.

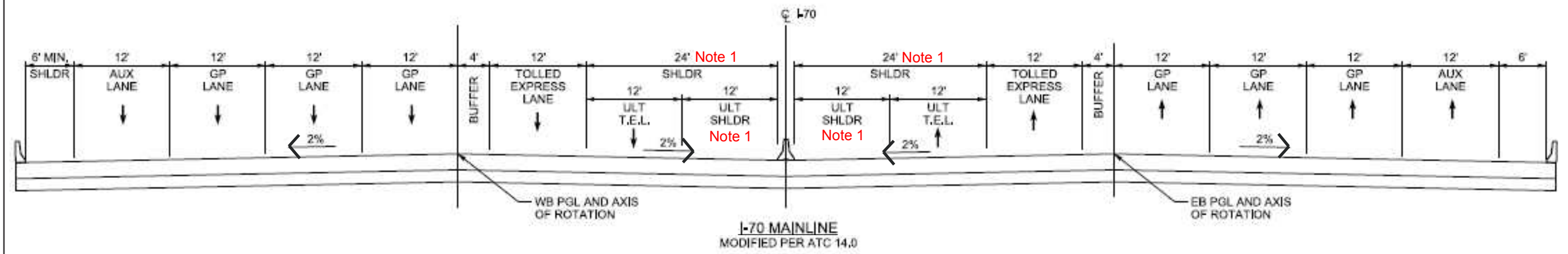
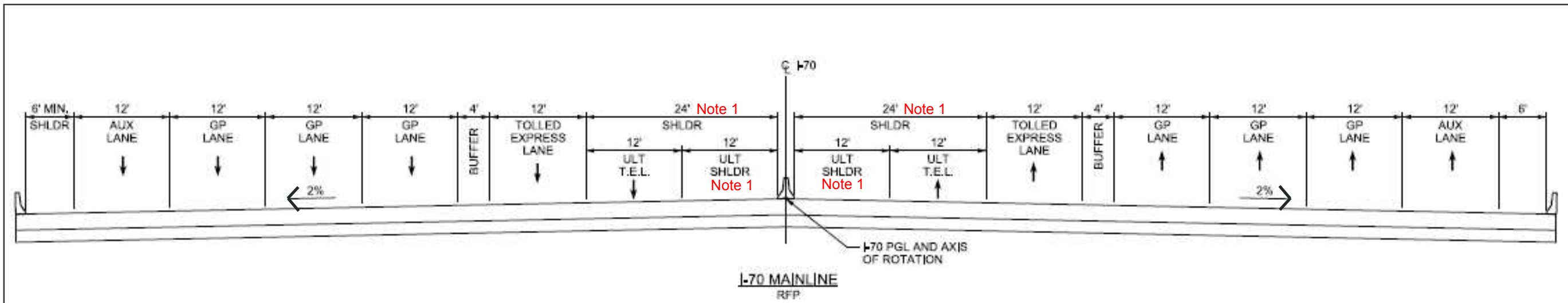
#### b) Proposed Revisions to address Inconsistencies

KMP has included the following attachments with tracked changes for the changes in the sections listed above.

- Section 10B.10.9.01 of Schedule 10B (Contract Drawings) of the Project Agreement **Roadway Typical Sections** as shown in **Attachment C**.



Section 10B.10.13.01 of Schedule 10B (Contract Drawings) of the Project Agreement **Structure Typical Sections** as shown in **Attachment C**.



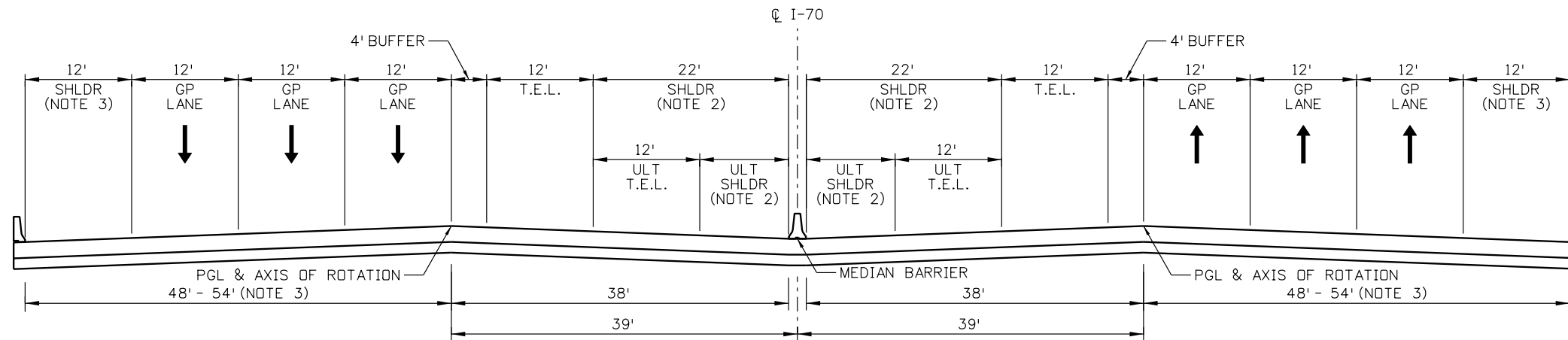
Note 1. Shoulder dimensions will be modified to match widths approved in Design Exception 2 (Brighton Blvd. to Steele/Vasquez Blvd.) and Design Exception 3 (Steele/Vasquez Blvd. to Dahlia St.)



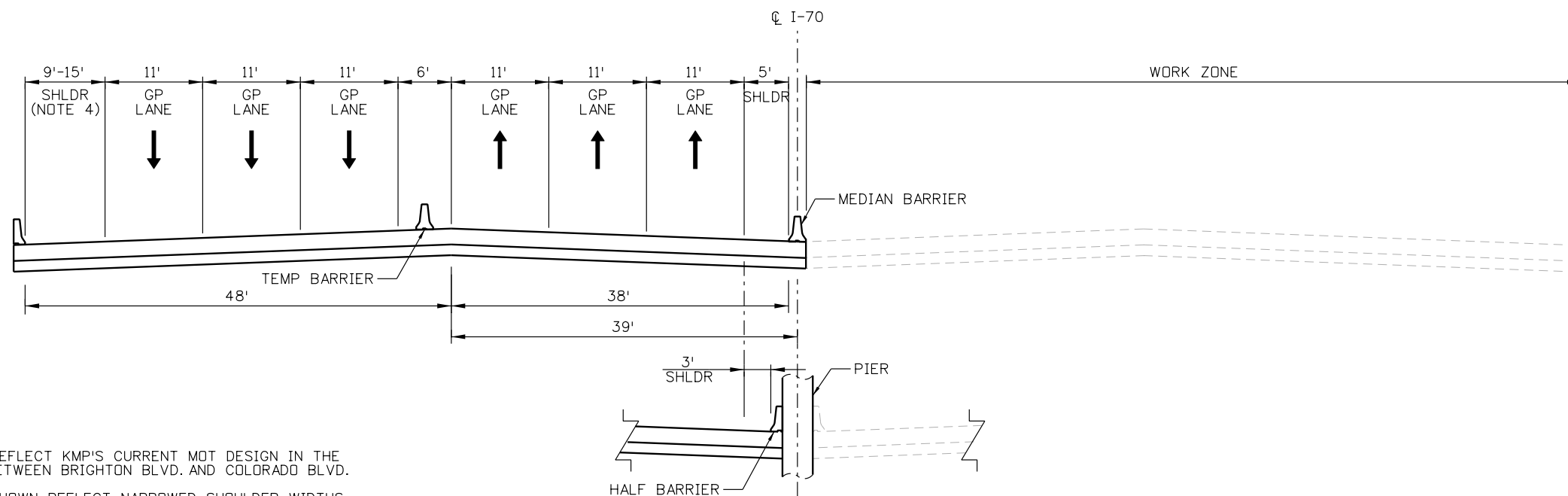
REFERENCE	SECTION	PAGE
B.1	Overview Description	1
B.7	Conceptual Dwgs	4

ALTERNATIVE TECHNICAL CONCEPT  
**MODIFIED TYPICAL SECTION**  
 ATTACHMENT A

ATC NUMBER  
**14.2**  
 SHEET NUMBER 1 OF 1



MODIFIED TYPICAL SECTION ULTIMATE CONFIGURATION



MODIFIED TYPICAL SECTION TEMPORARY CONFIGURATION

NOTES

1. TYPICAL SECTIONS REFLECT KMP'S CURRENT MOT DESIGN IN THE LOWERED SECTION BETWEEN BRIGHTON BLVD. AND COLORADO BLVD.
2. TYPICAL SECTIONS SHOWN REFLECT NARROWED SHOULDER WIDTHS APPROVED WITH DESIGN EXCEPTIONS 2 AND 3 BETWEEN BRIGHTON BLVD. AND DAHLIA ST.
3. TYPICAL SECTION ILLUSTRATES THE GENERAL PURPOSE LANE CONFIGURATION. THE OVERALL PAVEMENT WIDTH WILL INCREASE 6' IN LOCATION OF AN AUXILIARY LANE.
4. WB TRAFFIC OUTSIDE SHOULDER WIDTH DURING TEMPORARY CONFIGURATION WILL VARY BETWEEN 9' AND 15' DEPENDENT ON LOCATIONS OF ULTIMATE CONFIGURATION AUXILIARY LANES.



REFERENCE	SECTION	PAGE
B.7	Conceptual Dwg	4
B.9	Additional Info.	4

ALTERNATIVE TECHNICAL CONCEPT  
MODIFIED TYPICAL SECTION

ATTACHMENT B

ATC NUMBER  
**14.2**

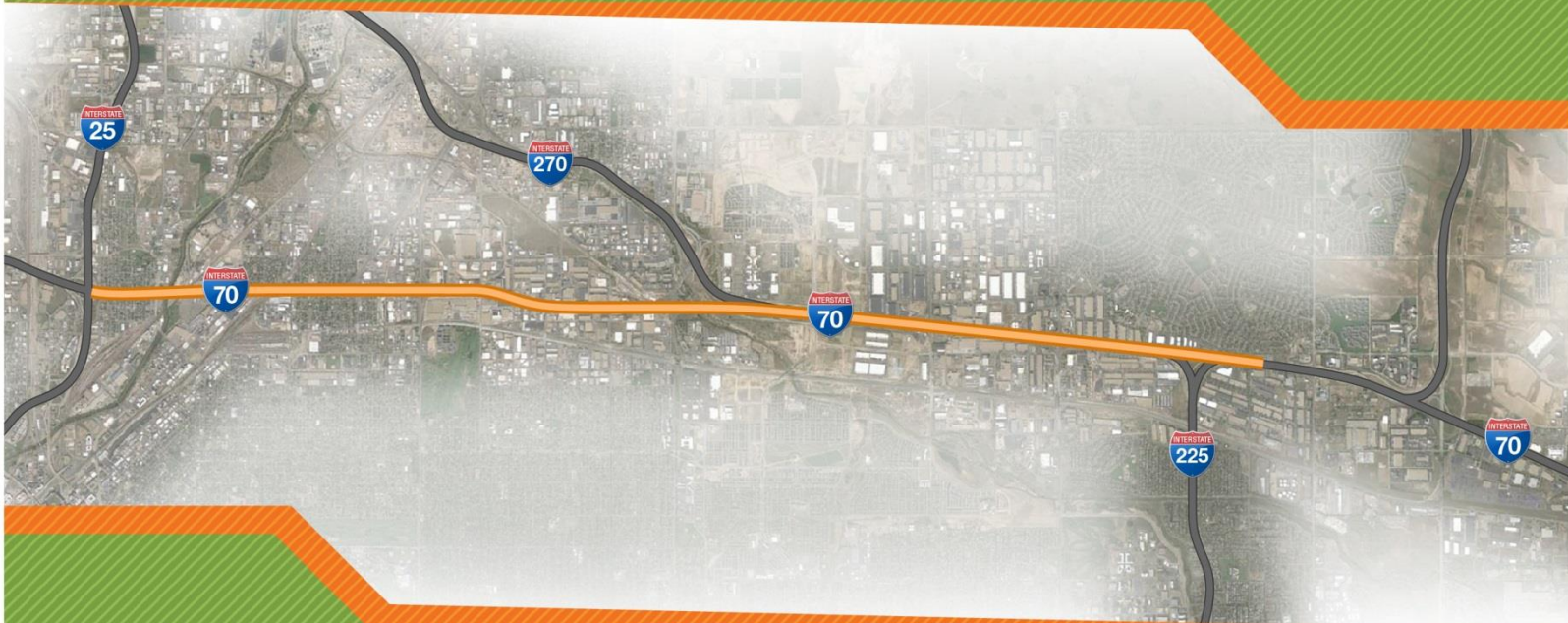
SHEET NUMBER 1 OF 1



# Central 70 Project

ATC 14.2

Attachment C- Tracked Changes to Schedule 10B



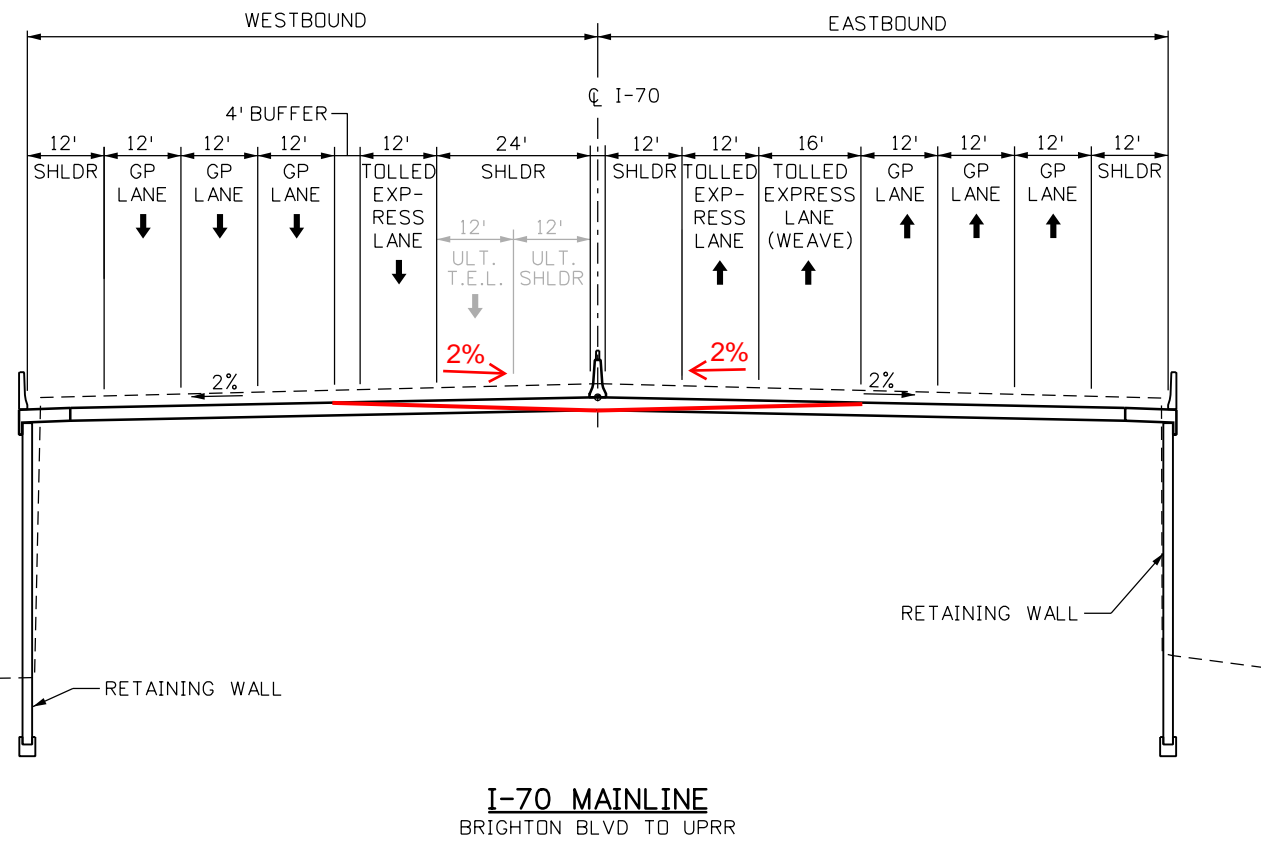
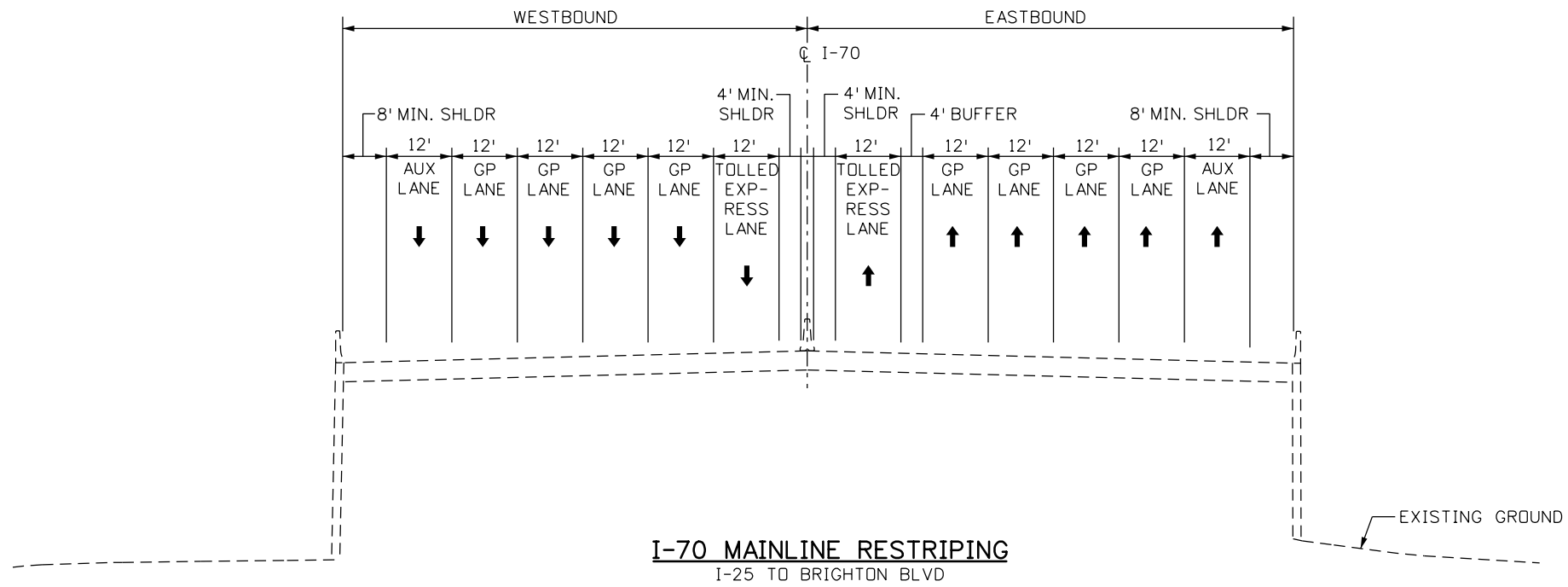
Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 06, 2016





- NOTES:
1. IN LOCATIONS WHERE AN AUXILIARY LANE IS NOT PRESENT, PROVIDE A 12' OUTSIDE SHOULDER.
  2. WITHIN MAINLINE RESTRIPING SECTION MATCH THE SAME NUMBER OF EXISTING GENERAL PURPOSE AND AUXILIARY LANES. ROADWAY STRIPING IS TO ACCOMMODATE ADDITIONAL TOLLED EXPRESS LANE.
  3. THE TOLLED EXPRESS LANE STRIPING INCLUDES A WEAVE LANE AT MOST INGRESS/EGRESS LOCATIONS.

Print Date: 2/12/2016  
 File Name: I3599DES\_Procurement\_TypicalSect-01-Section 10B\_I-70 Mainline.dgn  
 Horiz. Scale: NTS Vert. Scale: NTS  
 Unit Information Unit Leader Initials  
**ATKINS** 7604 Technology Way, Suite 400  
 Denver, CO 80237  
 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

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 Region 1 **KJS**

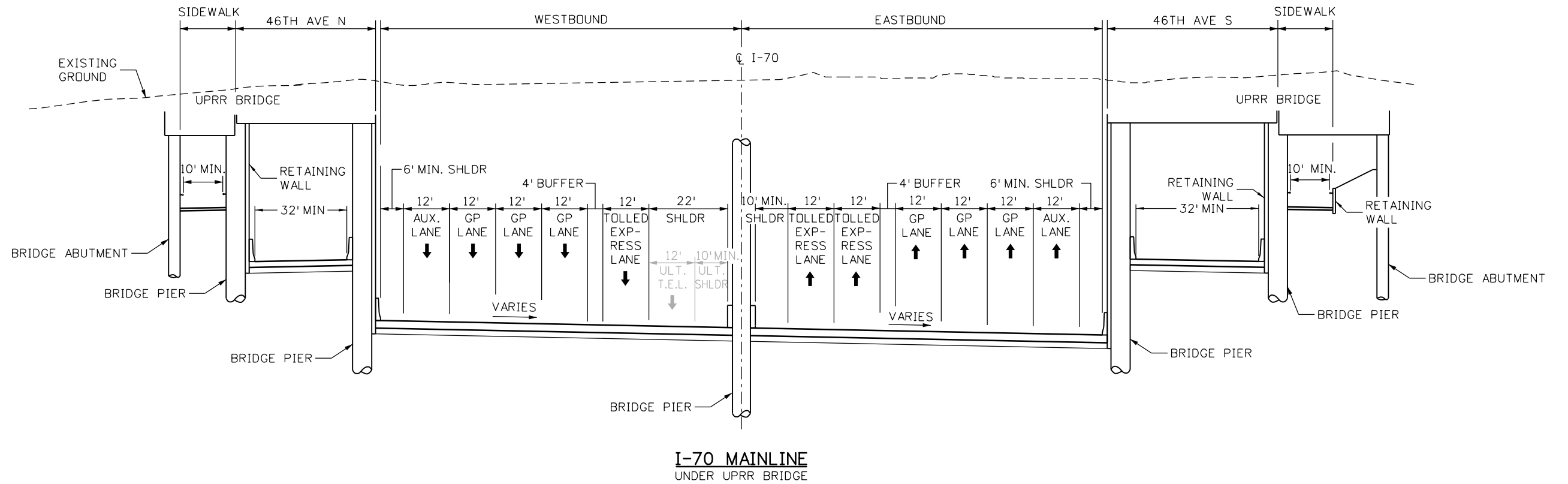
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 Revised:  
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**I-70 MAINLINE TYPICAL SECTIONS**  
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 Detailer:  
 Sheet Subset: 10B Rdwy  
 Structure Numbers  
 Subset Sheets: 1 of 17

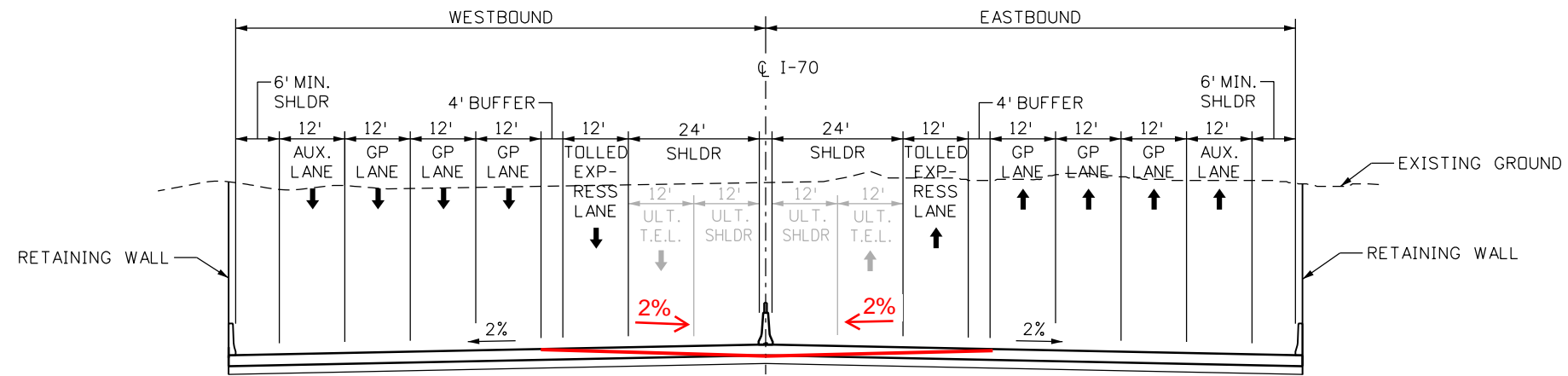
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 Sheet Number 1

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**I-70 MAINLINE**  
UNDER UPRR BRIDGE




**I-70 MAINLINE**  
UPRR TO COLORADO BLVD

- NOTES:
1. AT LOCATIONS WHERE A CONTINUOUS AUXILIARY LANE IS NOT PROVIDED, PROVIDE A 12' OUTSIDE SHOULDER.
  2. THE TOLLED EXPRESS LANE STRIPING INCLUDES A WEAVE LANE AT MOST INGRESS/EGRESS LOCATIONS.

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Region 1 KJS

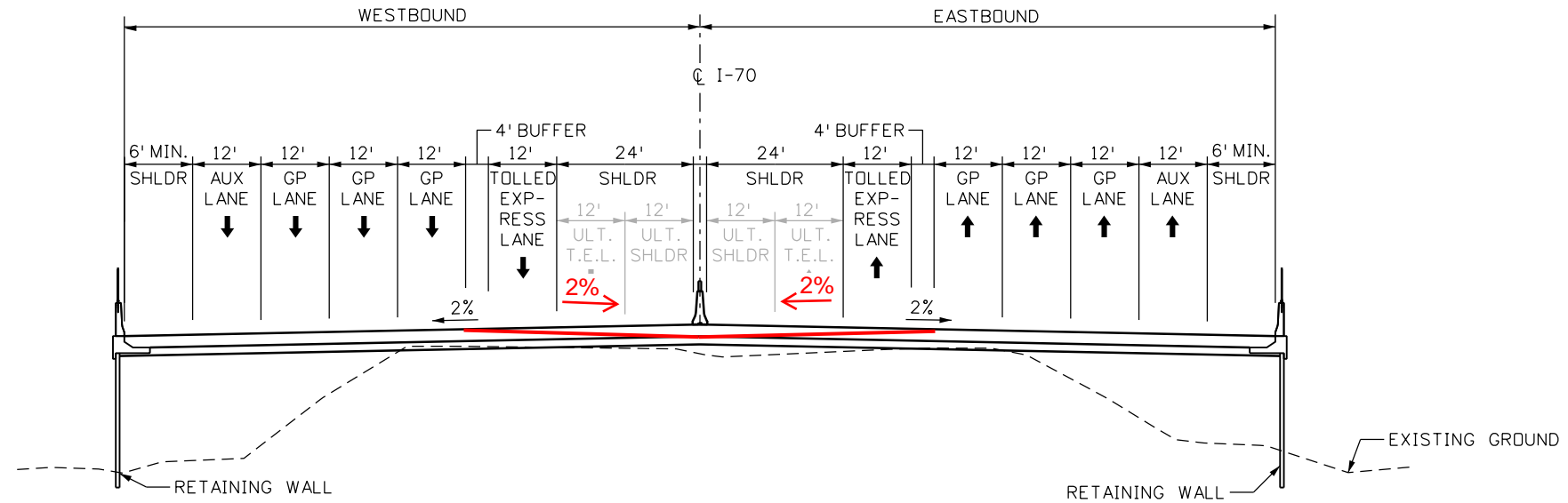
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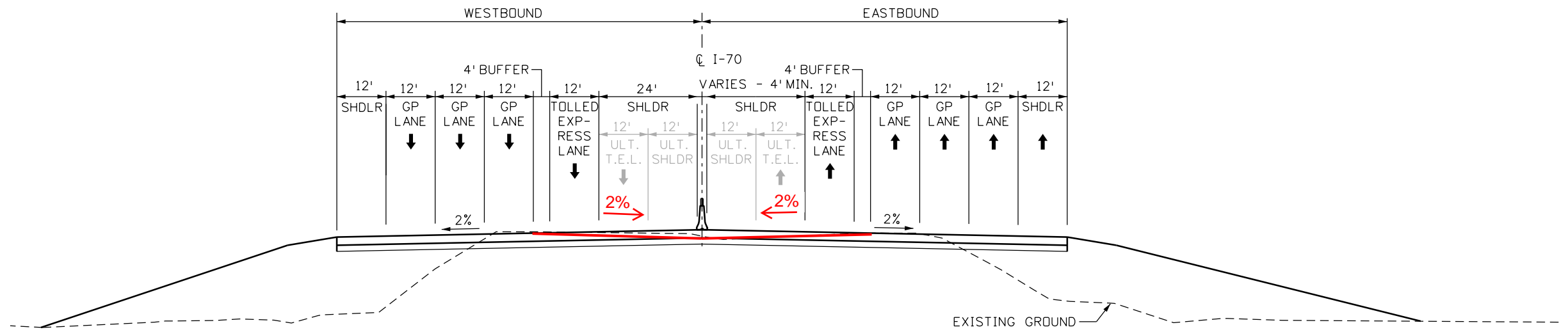
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**I-70 MAINLINE**  
COLORADO BLVD TO QUEBEC ST




**I-70 MAINLINE**  
QUEBEC ST TO SAND CREEK

- NOTES:
1. THE TOLLED EXPRESS LANE STRIPING INCLUDES A WEAVE LANE AT MOST INGRESS/EGRESS LOCATIONS.
  2. AT LOCATIONS WHERE A CONTINUOUS AUXILIARY LANE IS NOT PROVIDED, PROVIDE A 12' OUTSIDE SHOULDER.
  3. STRIPING FOR PROJECT TRANSITIONS FROM ULTIMATE STRIPING TO WIDENING ONLY AT QUEBEC ST. PAVEMENT WIDTH BETWEEN QUEBEC ST AND SAND CREEK SHALL MATCH ULTIMATE WIDTH.

Print Date: 2/12/2016	
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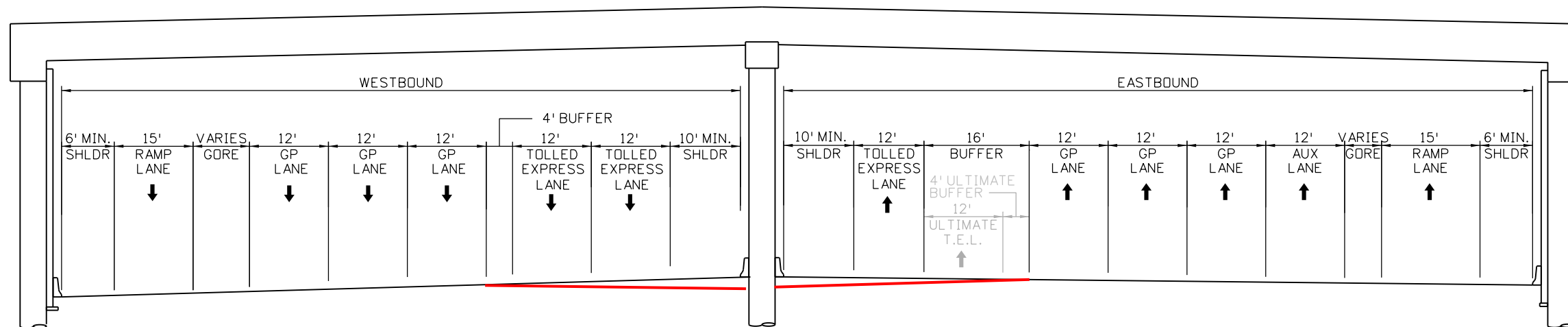
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19631
Sheet Number <b>3</b>

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**I-70 COVER**  
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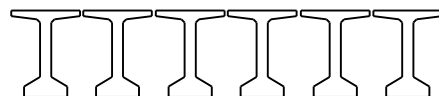
WEST BOOKEND LOADING OVER I-70 COVER

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LP (COMPOSITE) = PEDESTRIAN LOADING, 75 PSF
DC (COMPOSITE) = MISC. DEAD LOAD (SDL), 20PSF
DC (COMPOSITE) = FANS LOADING, 10PSF
DC (COMPOSITE) = FIRE PROTECTION LOAD, 20PSF
DC (COMPOSITE) = SOIL LOAD, 75PSF
DC (NON COMPOSITE) = 5" DECK + 2" HAUNCH



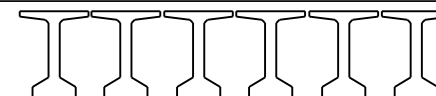
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DC (COMPOSITE) = FIRE PROTECTION LOAD, 20PSF
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DC (NON COMPOSITE) = 8" DECK + 2" HAUNCH + SIP FORMS



EAST BOOKEND LOADING OVER I-70 COVER

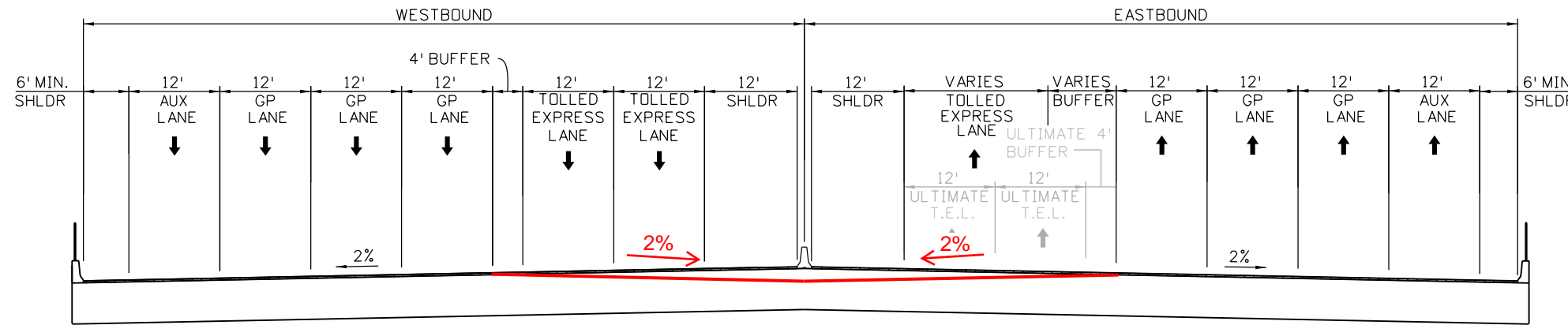
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DC (COMPOSITE) = MISC. DEAD LOAD (SDL), 20PSF
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DC (COMPOSITE) = SOIL LOAD, 75PSF
DC (NON COMPOSITE) = 8" DECK + 2" HAUNCH



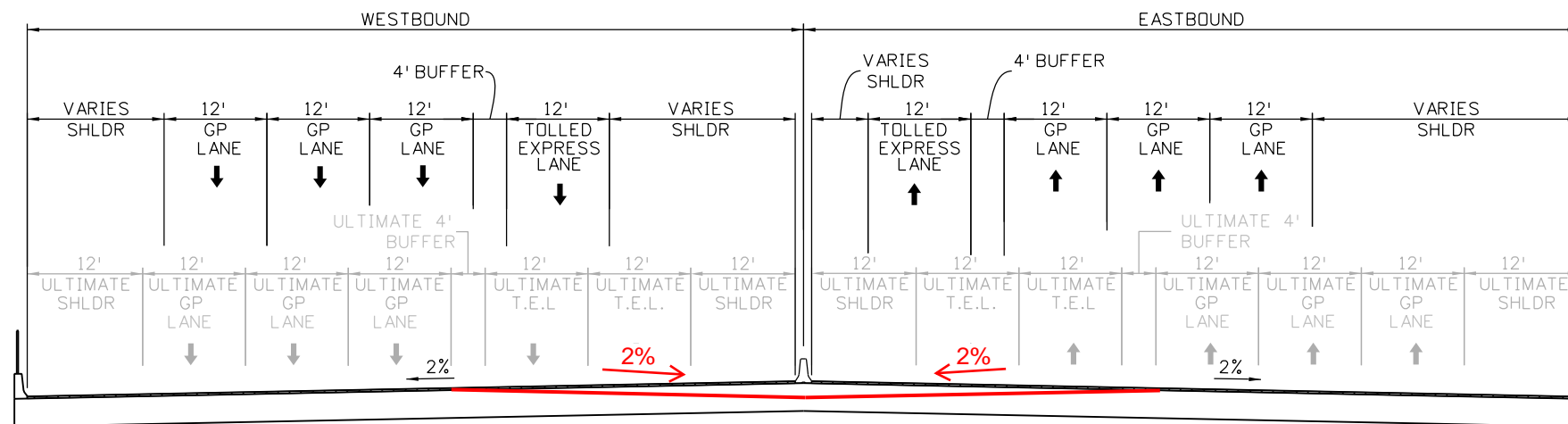
NOTES:

- REFER TO ROADWAY PLAN SHEETS LOCATED IN SCHEDULE 29 REFERENCE DOCUMENTS FOR ROADWAY GEOMETRY WITHIN COVER.
- THE PROVIDED DESIGN LOADS WERE USED FOR THE DEPARTMENT'S REFERENCE DESIGN AND SHALL BE CONSIDERED AS MINIMUM LOADS TO BE USED FOR THE DEVELOPER'S DESIGN. THE DEVELOPER'S STRUCTURAL DESIGN LOADING FOR THE COVER SHALL BE THE MINIMUM DESIGN LOADS PROVIDED OR THE DEVELOPER'S ACTUAL DESIGN LOADING; WHICHEVER IS GREATER.

Print Date: 2/17/2016		<b>Sheet Revisions</b> Date:      Comments      Init.				<b>PRELIMINARY</b> No Revisions:  Revised:  Void:	<b>STRUCTURE TYPICAL SECTIONS</b>			Project No./Code	
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<b>ATKINS</b> 7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276			2000 South Holly Street Denver, CO 80222 Phone: 303-757-9934 FAX: 303-757-9907	Region 1			KJS	Designer: Detailer: Sheet Subset: 10B Struct	Structure Numbers Subset Sheets: 05 of 12	19631	Sheet Number <b>5</b>



**I-70 MAINLINE OVER MONACO**  
(STR. NO. E-17-AFJ WB, E-17-AFK EB)



**I-70 MAINLINE OVER QUEBEC STREET**  
(STR. NO. E-17-AFQ WB, E-17-AFR EB)

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Unit Information Unit Leader Initials	
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Sheet Revisions		
Date:	Comments	Init.

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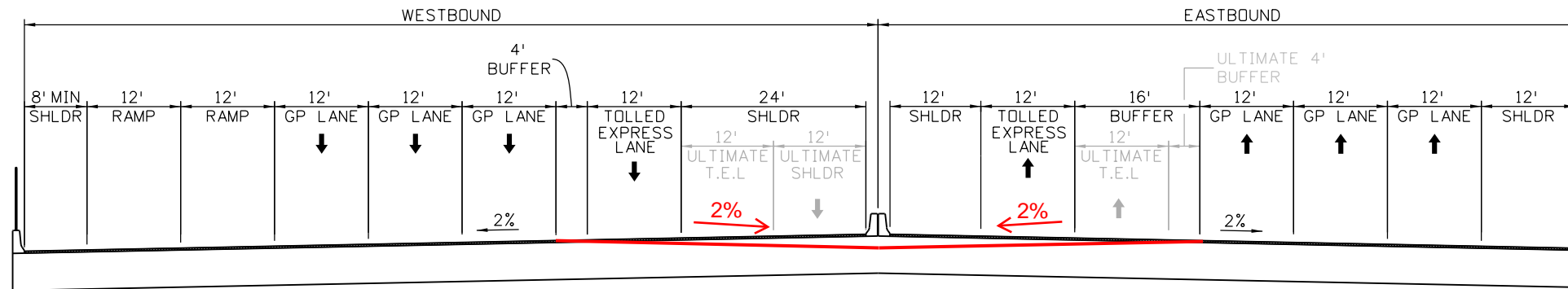
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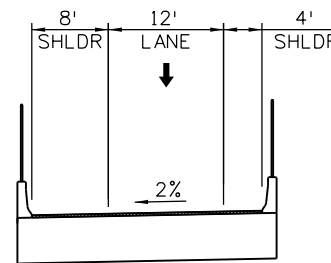
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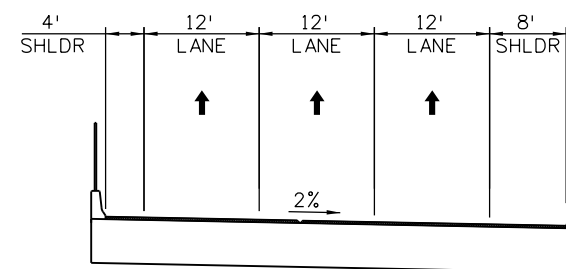
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**I-70 OVER DENVER ROCK ISLAND RR**  
(STR. NO. E-17-AFN WB, E-17-AFD EB)



**STAPLETON DR. N. OVER DENVER ROCK ISLAND RR**  
(STR. NO. E-17-ADT)



**QUEBEC EASTBOUND EXIT RAMP OVER DENVER ROCK ISLAND RR**  
(STR. NO. E-17-ADU)

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Sheet Revisions		
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Detailer:			
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**Sedan**

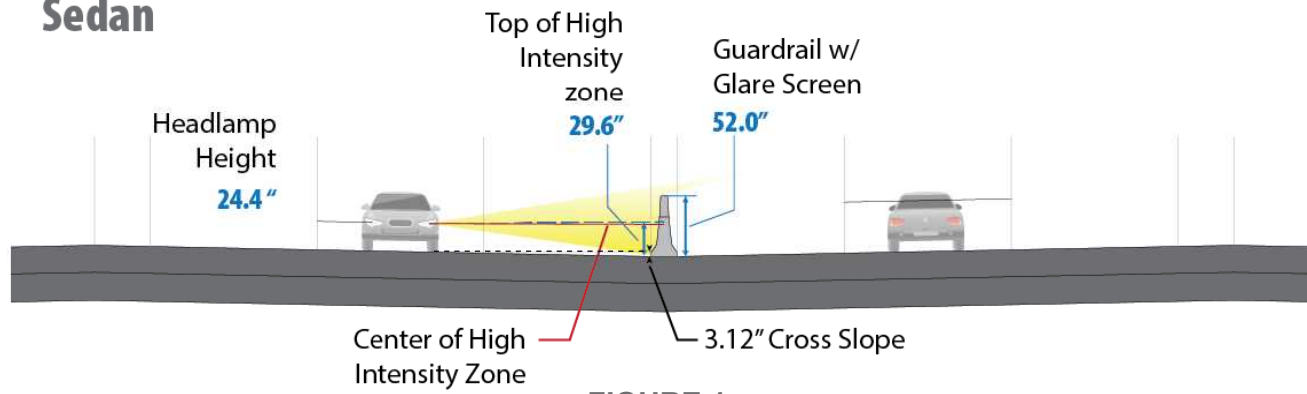


FIGURE 1

**Light Truck With Lift**

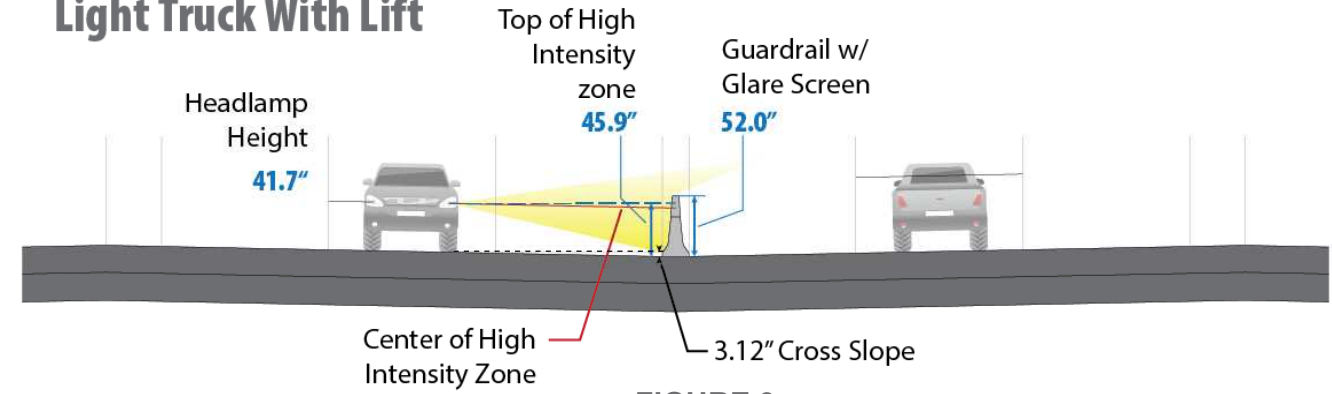


FIGURE 3

**Light Truck**

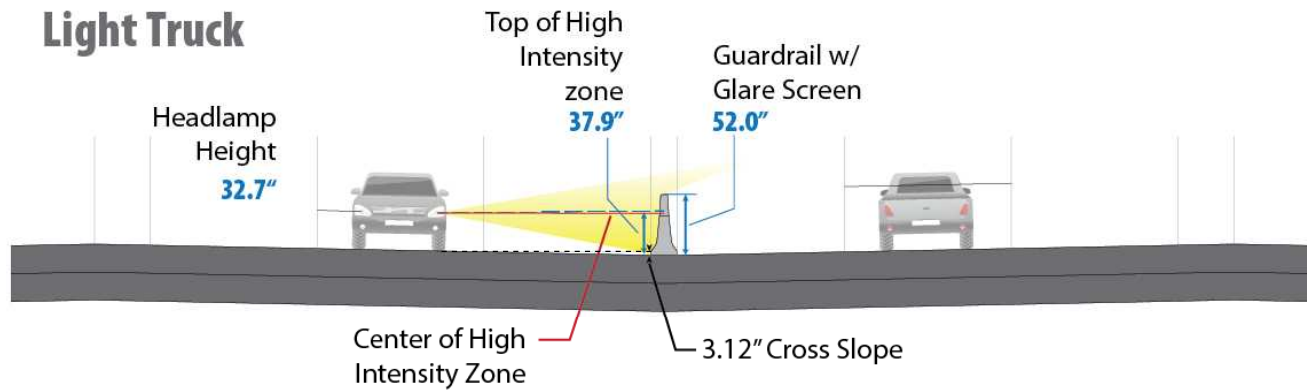


FIGURE 2

**Max Possible**

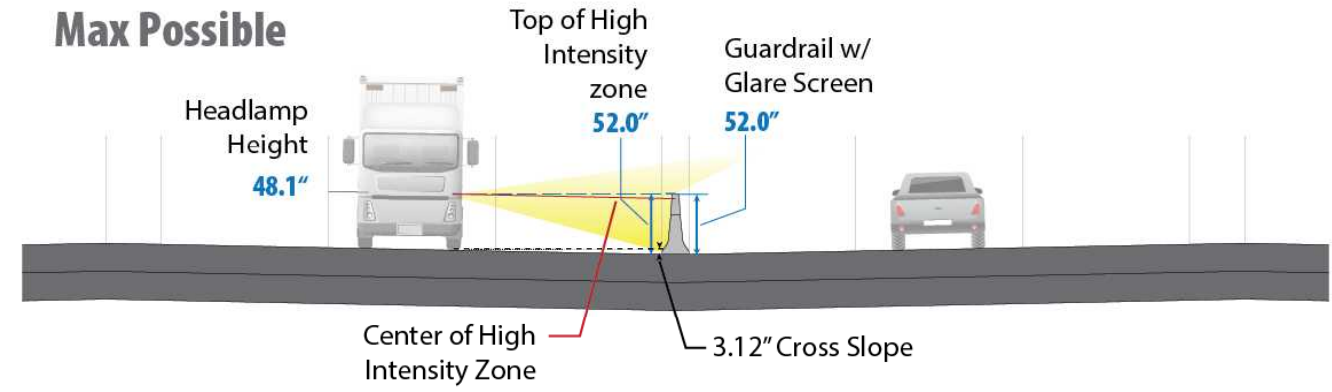


FIGURE 4

Vehicle Type	Vehicle Headlamp Height	Pavement Cross-Slope	Max Aim Inspection Limit *(13/25)	Top of High Intensity Zone
Sedan	24.4"	3.12"	2.08"	29.6"
Light Truck	32.7"	3.12"	2.08"	37.9"
Light Truck w/ Lift	41.7"	3.12"	1.04"	45.9"
Max Possible	48.1"	3.12"	1.04"	52.0"



DATE: August 31, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 17.1

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 17.1 has been reviewed by the Procuring Authorities.

Detailed ATC 17.1 proposes to revise the 100% UPRR Trackwork Plans by modifying the construction phasing for the UPRR Grade Separation Structure and the related design for temporary trackwork phasing.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. The Procuring Authorities would like to make KMP aware that we have not vetted this concept with the UPRR. We are currently pursuing the trackwork plans shown in the Project Agreement and do not want to confuse the issue with UPRR by showing them KMP's approach.
- 2. KMP shall be responsible for any schedule impacts from the UPRR plan approval process, altered ROW acquisition process, and the anticipated amendment to the fully negotiated UPRR RRA.
- 3. KMP shall be responsible for the obtaining approval for this ATC concept from the UPRR.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to



Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



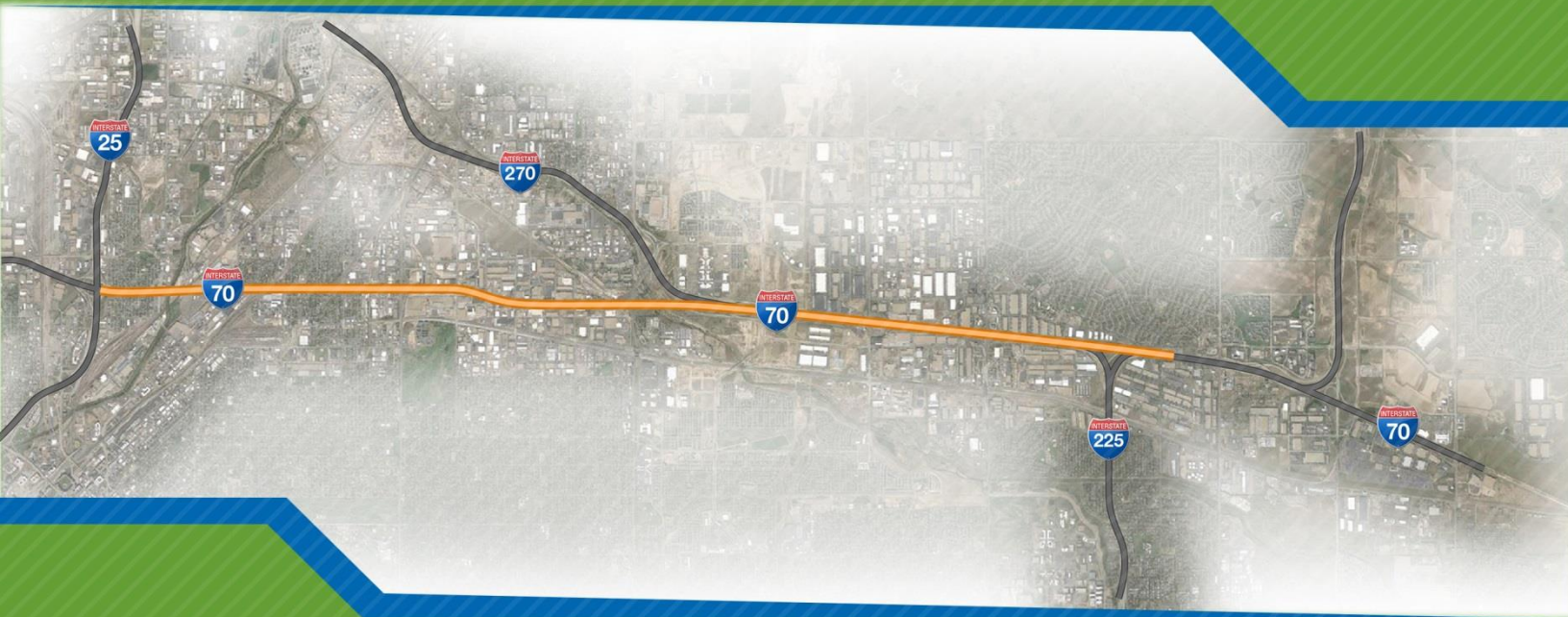




# Central 70 Project

Alternative Technical Concept Submission

ATC 17.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 17.1**

**Revised UPRR Track Phasing**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

The response to ATC No. 17.0 requested a re-submission as a detailed ATC

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

Kiewit-Meridiam Partners (KMP) is proposing to revise the 100% UPRR Trackwork Plans by modifying the construction phasing for the UPRR Grade Separation Structure and the related design for temporary trackwork phasing. This ATC is not proposing modifications to the permanent trackwork design.

The revised construction phasing would reconfigure the temporary trackwork so that the new UPRR Grade Separation Structure and Service Road Bridge could be constructed in two phases without active tracks on both sides of the construction zone. KMP's temporary track configuration provides enhanced safety benefits to both the construction team and the UPRR operations by eliminating construction work within confined areas and located between multiple active tracks. In addition to the improved safety, the revised phasing also results in significant construction schedule savings and UPRR operations will perform in an equal or better manner than the phasing presented in the Project Agreement (PA).

### ATC 17.1 Benefits

- ✓ Improves worker safety during construction for KMP and UPRR
- ✓ Decreases initial construction cost and Project schedule
- ✓ Reduces construction duration within UPRR ROW
- ✓ Improves construction coordination with UPRR operations
- ✓ Minimizes bridge construction restrictions imposed due to train operations



## 2. Relevant RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC will modify the temporary trackwork design and construction phasing for the UPRR Grade Separation Structure to be provided in the 100% UPRR Trackwork Plans referenced in Schedule 10 Sections 10.1.2.b.i and 10.1.2.f. of the PA. The permanent trackwork design will not be modified under this ATC.

## 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC.

The temporary trackwork design for the construction phasing presented in the PA includes two active shoofly tracks which straddle the UPRR Grade Separation Structure footprint. The PA also includes multiple track shifts to allow for phased construction of the UPRR Grade Separation Structure and the Service Road Bridge. The PA phasing is challenging and inefficient from a construction standpoint; requiring the contractor to work within an envelope confined by two active tracks. At the UPRR Topic Meeting on April 5<sup>th</sup>, Proposers were advised that as many as 26 trains a day pass the site on the mainline tracks and any number of train movements would occur on the yard tracks. The proposed revisions will allow for predictable, safe access across these tracks, as well as defined construction work windows within 25 feet of an active track, allowing construction to proceed within a reasonable timeframe, appears problematic under the phasing presented in the PA.

In developing this ATC, KMP first optimized the geometric layout of I-70, 46th Ave. North, and 46th Ave. South between Brighton Blvd. and York St. This optimization was necessary because the construction of the UPRR Grade Separation Structure abutment creates the critical pinch points for the temporary track layout. KMP's optimization resulted in a slight adjustment to the location of both the southern and northern abutments of the new UPRR Grade Separation Structure which relieves alignment pinch points. KMP's adjustment to the bridge layout also provides sufficient area to fit the temporary track alignments to one side of the UPRR Grade Separation Structure construction area during each phase.

The proposed temporary track alignment meets current UPRR and AREMA criteria and offers an alternative phasing plan that eliminates the concurrently active shoofly tracks that straddle the UPRR Grade Separation Structure construction area. In KMP's proposed construction phasing, the mainline tracks are first shifted to an eastern shoofly track, and the Pepsi Lead and yard tracks will remain on the eastern side of the existing UPRR bridge. Partial demolition of the existing UPRR bridge allows the western portion of the proposed UPRR Grade Separation Structure to be constructed completely to the west of active UPRR operations using safe access from the west side of the work zone. At the completion of the first phase of construction, the tracks are shifted to the new UPRR Grade Separation Structure and a western shoofly track is constructed. This shift, combined with the western shoofly track allows the remaining eastern half of the existing UPRR bridge to be demolished and the remaining half of new UPRR Grade Separation Structure to be constructed completely to the east of the active UPRR operations. This construction phase will again provide safe access, this time from east of the work zone. Following construction of the UPRR Grade Separation Structure, the tracks are then shifted to their permanent locations.

As a result of the modified phasing, constructability and safety are vastly improved because of the unobstructed construction access from one side of the bridge at all times. Safety is improved because construction personnel and equipment are no longer required to cross active tracks during construction of the new UPRR Grade Separation Structure. As discussed in the April 5<sup>th</sup> UPRR Coordination meeting, UPRR desires the shortest UPRR Grade Separation Structure construction schedule possible. This ATC provides a significant shortening of the construction schedule.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

The proposed temporary trackwork design and construction phasing for the UPRR Grade Separation Structure will not result in any adverse impacts for the Department or other Project Stakeholders. This ATC provides significant benefits including:

- **Safety:** Enhanced safety for bridge construction crews, the Department's oversight and inspection staff, and UPRR personnel and operations
- **Minimize Impacts:** Expedited construction schedule for the UPRR Grade Separation Structure through improved constructability because no work will occur between active tracks and reduces the overall construction period by five months
- **Optimize Scope:** This ATC reduces overall costs of the Project by approximately \$12 million and maintains economic vitality through reduced risk of conflicts between UPRR track operations and adjacent construction activities

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

Construction cost savings for this ATC are approximately \$12 million due to efficiencies gained in construction means and methods, reductions in schedule (see Section 6) and reduced railroad flagging costs.

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

The UPRR Grade Separation Structure construction is on the critical path for the Project schedule. Incorporation of this ATC results in an overall construction schedule reduction of approximately 5 months.

## 7. Conceptual Drawings

This information **has been** amended since the submission of the previous version of this ATC to include Attachment B.

**Attachment A:** proposed UPRR Grade Separation Structure construction phasing and temporary track alignments.

**Attachment B:** Tracked changes to Schedule 10 Section 10.1.2 of the PA

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

The proposed construction phasing that limits construction to one side of active railroad tracks is standard practice by all rail owners throughout the U.S. Implementation of this ATC better aligns with standard railroad practice.

## 9. Additional Information

This information *has been* amended since the submission of the previous version of this ATC to include responses to the Procuring Authorities comments on ATC No. 17.0.

### **ATC No. 17.0 Comment No. #1**

*As discussed at the April One-on-One meeting, the Procuring Authorities are proceeding with obtaining the RRA with the UPRR. The RRA will contain track phasing plans that have been agreed to by the UPRR. All risk and responsibility for approval of the revised phasing plans will be KMP's.*

**KMP Response:** KMP understands and accepts all risk and responsibility for approval of the revised phasing plans.

### **ATC No. 17.0 Comment No. #2**

*The Procuring Authorities would like to bring attention to Reference Document 29.10.10.08. This document was recently released as a part of a Reference Document update and it outlines some location specific design requirements that have been required by the UPRR.*

**KMP Response:** KMP appreciates the Procuring Authorities noting the location specific design requirements required by the UPRR in Reference Document 29.10.10.08. KMP has reviewed the specific design requirements and acknowledges that further analysis will need to be completed through the design process to ensure all location specific design requirements are met. KMP accepts all risk and responsibility for any potential changes to the location specific design requirements.

## C. Detailed ATC Requirements

### 1. Risks

KMP will retain all risk of UPRR approval of the final design and phasing plans. There will be no change or additional risk to the Procuring Authorities, CDOT, the State, or third parties associated with the implementation of this ATC.

### 2. Handback

There are no changes in the Handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional right-of-way is required to implement this ATC.

## 4. List of Required Approvals

No change in approvals is required to implement this ATC. KMP will be responsible for obtaining approval from the UPRR for the final design and phasing plans.

## 5. Proposed Drafting Revisions

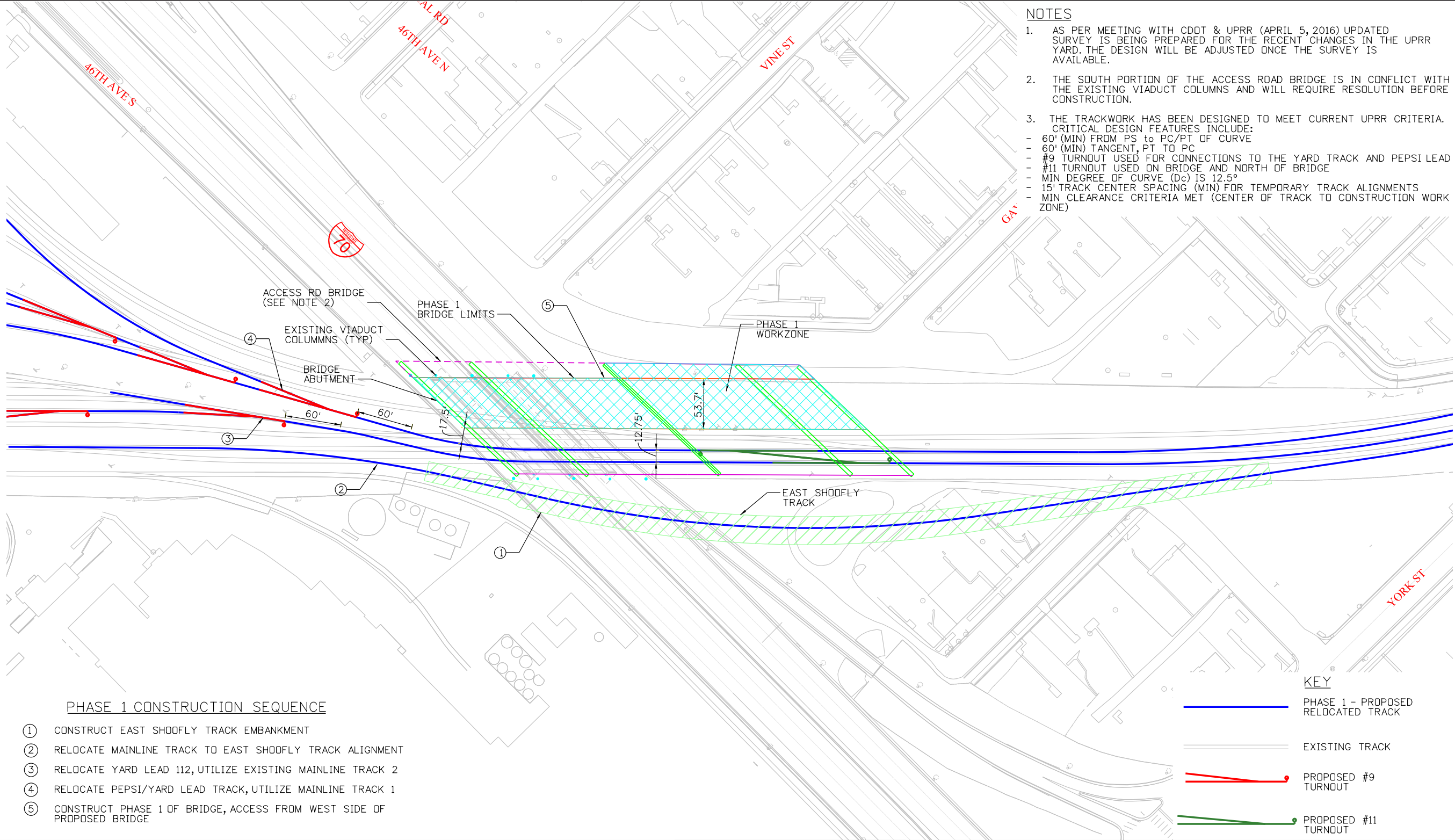
### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10 Section 10.1.2 of the PA

### b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment B** with tracked changes for the changes in the section listed above.



- NOTES**
- AS PER MEETING WITH CDDT & UPRR (APRIL 5, 2016) UPDATED SURVEY IS BEING PREPARED FOR THE RECENT CHANGES IN THE UPRR YARD. THE DESIGN WILL BE ADJUSTED ONCE THE SURVEY IS AVAILABLE.
  - THE SOUTH PORTION OF THE ACCESS ROAD BRIDGE IS IN CONFLICT WITH THE EXISTING VIADUCT COLUMNS AND WILL REQUIRE RESOLUTION BEFORE CONSTRUCTION.
  - THE TRACKWORK HAS BEEN DESIGNED TO MEET CURRENT UPRR CRITERIA. CRITICAL DESIGN FEATURES INCLUDE:
    - 60' (MIN) FROM PS TO PC/PT OF CURVE
    - 60' (MIN) TANGENT, PT TO PC
    - #9 TURNOUT USED FOR CONNECTIONS TO THE YARD TRACK AND PEPSI LEAD
    - #11 TURNOUT USED ON BRIDGE AND NORTH OF BRIDGE
    - MIN DEGREE OF CURVE (Dc) IS 12.5°
    - 15' TRACK CENTER SPACING (MIN) FOR TEMPORARY TRACK ALIGNMENTS
    - MIN CLEARANCE CRITERIA MET (CENTER OF TRACK TO CONSTRUCTION WORK ZONE)

**PHASE 1 CONSTRUCTION SEQUENCE**

- CONSTRUCT EAST SHOOFLY TRACK EMBANKMENT
- RELOCATE MAINLINE TRACK TO EAST SHOOFLY TRACK ALIGNMENT
- RELOCATE YARD LEAD 112, UTILIZE EXISTING MAINLINE TRACK 2
- RELOCATE PEPSI/YARD LEAD TRACK, UTILIZE MAINLINE TRACK 1
- CONSTRUCT PHASE 1 OF BRIDGE, ACCESS FROM WEST SIDE OF PROPOSED BRIDGE

**KEY**

- PHASE 1 - PROPOSED RELOCATED TRACK
- EXISTING TRACK
- PROPOSED #9 TURNOUT
- PROPOSED #11 TURNOUT



REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	3

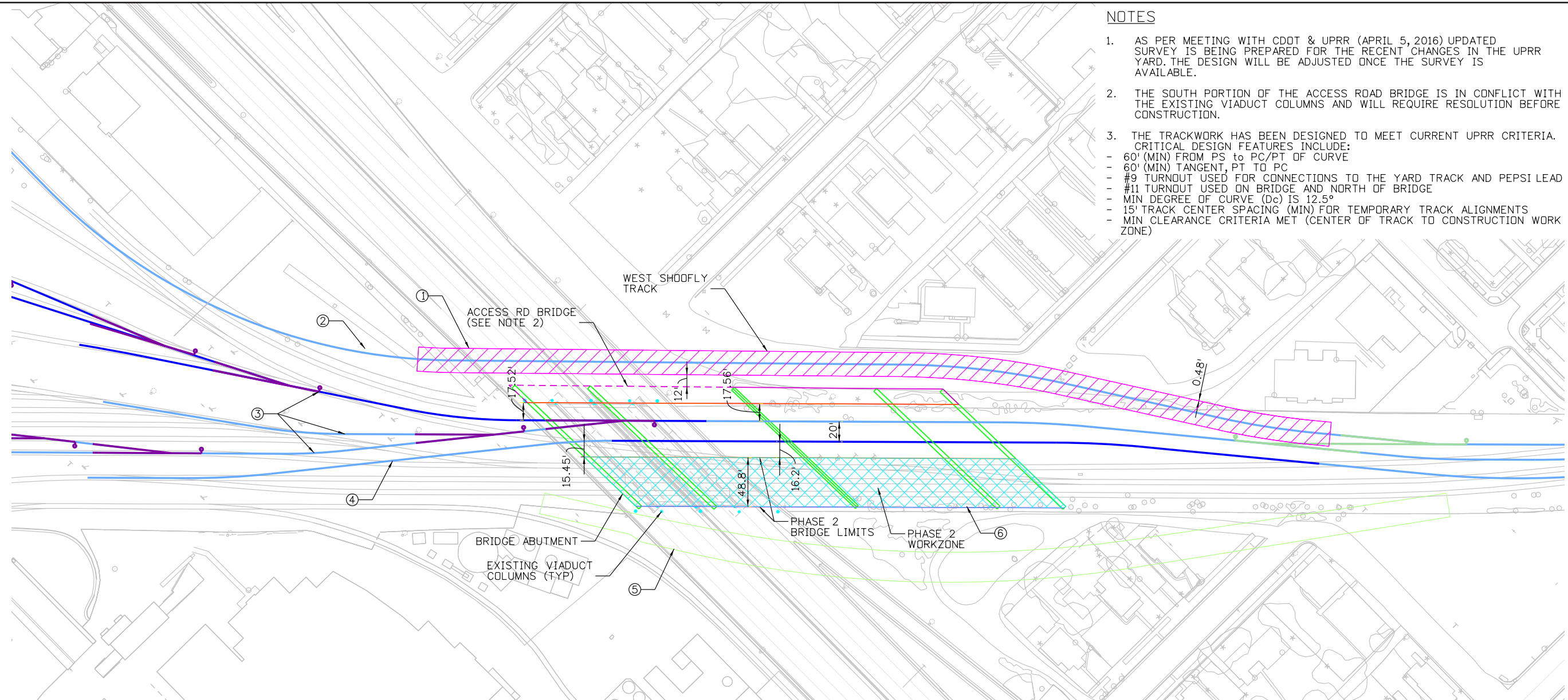
ALTERNATIVE TECHNICAL CONCEPT  
**REVISED UPRR TRACK PHASING**  
 ATTACHMENT A

ATC NUMBER  
**17.1**  
 SHEET NUMBER 1 OF 2



**NOTES**

1. AS PER MEETING WITH CDDT & UPRR (APRIL 5, 2016) UPDATED SURVEY IS BEING PREPARED FOR THE RECENT CHANGES IN THE UPRR YARD. THE DESIGN WILL BE ADJUSTED ONCE THE SURVEY IS AVAILABLE.
2. THE SOUTH PORTION OF THE ACCESS ROAD BRIDGE IS IN CONFLICT WITH THE EXISTING VIADUCT COLUMNS AND WILL REQUIRE RESOLUTION BEFORE CONSTRUCTION.
3. THE TRACKWORK HAS BEEN DESIGNED TO MEET CURRENT UPRR CRITERIA. CRITICAL DESIGN FEATURES INCLUDE:
  - 60' (MIN) FROM PS TO PC/PT OF CURVE
  - 60' (MIN) TANGENT, PT TO PC
  - #9 TURNOUT USED FOR CONNECTIONS TO THE YARD TRACK AND PEPSI LEAD
  - #11 TURNOUT USED ON BRIDGE AND NORTH OF BRIDGE
  - MIN DEGREE OF CURVE (Dc) IS 12.5°
  - 15' TRACK CENTER SPACING (MIN) FOR TEMPORARY TRACK ALIGNMENTS
  - MIN CLEARANCE CRITERIA MET (CENTER OF TRACK TO CONSTRUCTION WORK ZONE)



**PHASE 2 CONSTRUCTION SEQUENCE**

- ① CONSTRUCT WEST SHOOFLY TRACK EMBANKMENT
- ② RELOCATE PEPSI LEAD TRACK TO WEST SHOOFLY TRACK ALIGNMENT
- ③ RELOCATE YARD LEAD TO PROPOSED BRIDGE (CONSTRUCTED IN PHASE 1)
- ④ RELOCATE MAINLINE TRACK TO BRIDGE (PHASE 1)
- ⑤ REMOVE EAST SHOOFLY TRACK EMBANKMENT
- ⑥ CONSTRUCT REMAINING PORTION OF BRIDGE, ACCESS FROM EAST SIDE OF PROPOSED BRIDGE

**KEY**

- PHASE 2 - PROPOSED RELOCATED TRACK
- PERMANENT TRACK LOCATION
- EXISTING TRACK
- PROPOSED #9 TURNOUT
- PROPOSED #11 TURNOUT



REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	3

ALTERNATIVE TECHNICAL CONCEPT  
**REVISED UPRR TRACK PHASING**  
 ATTACHMENT A

ATC NUMBER  
**17.1**

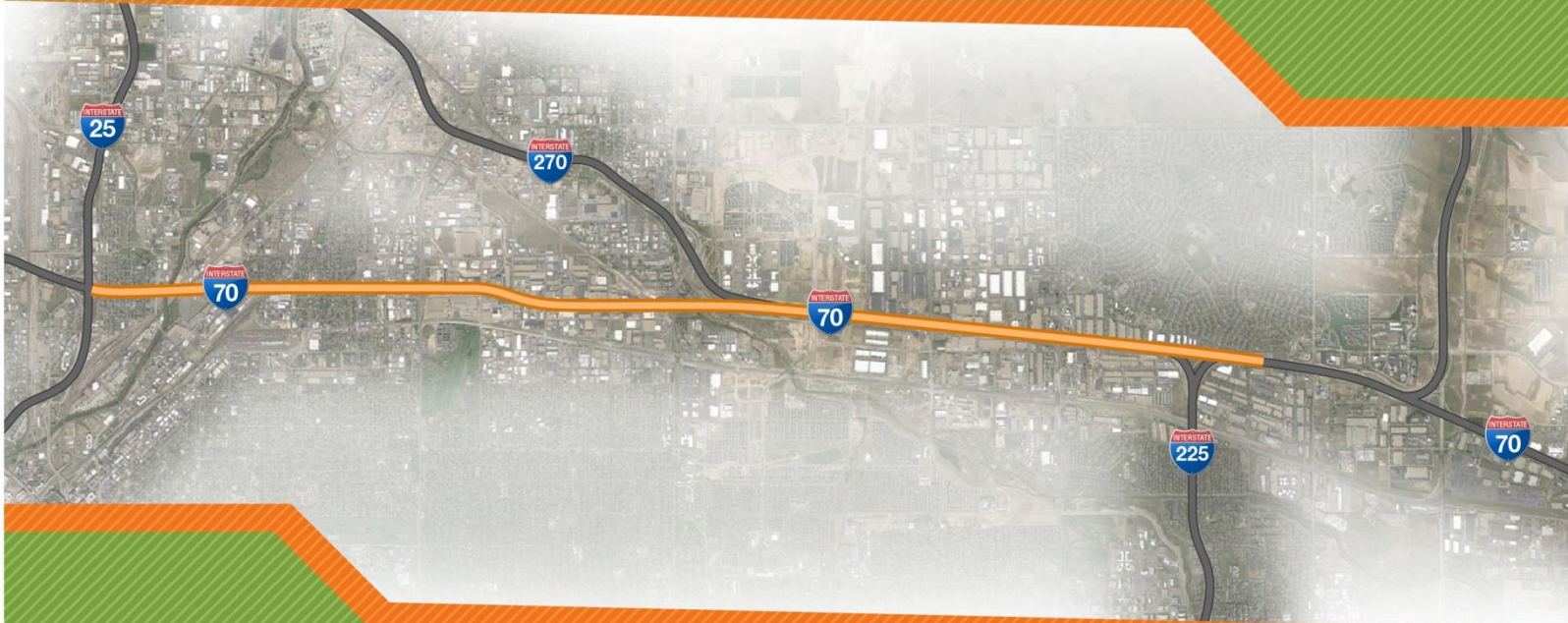
SHEET NUMBER 2 OF 2



# Central 70 Project

Attachment B – Tracked Changes to Section 10.1.2 of Schedule 10

ATC 17.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016



## 10. RAILROADS

### 10.1. General

10.1.1. This Section sets out the roles and responsibilities of the Developer, the Department, and the Railroads with respect to the requirements applicable to Construction Work performed on, over, under and/or adjacent to Railroad right-of-way, including track, ballast, structures and signals required for the Project.

#### 10.1.2. UPRR Crossing

- a. Existing conditions have the I-70 Mainline passing over the UPRR on a viaduct built in the early 1960's, while 46<sup>th</sup> Avenue passes under the UPRR via a grade separation structure built in 1939. The Construction Work includes bridge demolition, bridge construction, trackwork, Railroad signalization, I-70 Mainline and appurtenances construction, and Utility Work;
- b. The UPRR RRA reflects UPRR approval of:
  - i. 100% temporary and permanent trackwork design and construction phasing for the UPRR Crossing (100% UPRR Trackwork Plans) which the Developer shall not be permitted to amend except as permitted by Section 10.1.2.g;
  - ii. 30% design for the Construction Work on UPRR right-of-way including I-70 Mainline and the bridges that carry the trackwork and service road (30% UPRR Crossing Plans). The Developer shall complete the design and coordinate with UPRR to obtain approval of the 100% UPRR Crossing Plans;
- c. UPRR shall be responsible to provide all Railroad flagging and Railroad signalization. UPRR trackwork responsibilities shall consist of all track shifts and associated ballast work, and all track tie-in connections, including track and ballast work, that connects existing track to new Developer constructed track, and any additional work specified in Section 10.4.9 as UPRR's responsibility;
- d. The Developer shall be responsible for all other Elements of the UPRR Crossing, including but not limited to construction of I-70 Mainline and appurtenances, bridge construction, shoring, grading, all trackwork and ballast placement for track outside the 13 foot clear point as defined in the 100% UPRR Trackwork Plans, and all related Utility Work within and outside the UPRR ROW, and any additional work specified in Section 10.4.9 as the Developer's responsibility. It shall be the Developer's responsibility to coordinate the scheduling of all separate Railroad Forces required for the performance of all Construction Work related to the UPRR Crossing;
- e. The Department shall pay UPRR directly for their trackwork, ballast and Railroad signalization work. The Developer shall pay for all other costs of the UPRR Work (including associated flagging costs) directly to UPRR. Cost responsibilities of the Department to UPRR are further identified in the UPRR RRA included in the Reference Documents; and
- f. The UPRR approved 30% UPRR Crossing Plans, and the UPRR approved 100% UPRR Trackwork Plans are included in Schedule 10B Contract Drawings.
- f.g. The Developer may deviate from the UPRR approved 100% Trackwork Plans if revised plans are submitted and approved by the UPRR during final design. The Developer will accept all risk and responsibility for approval of the revised plans.

#### 10.1.3. UPRR Pepsi Lead Crossing

- a. Existing conditions have the UPRR Pepsi Lead Crossing Brighton Boulevard at-grade south of the I-70 Mainline. The Construction Work includes expansion of the existing at-grade crossing for the addition of a traffic lane and new traffic signal along Brighton Boulevard;
- b.



DATE: June 20, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 18.1

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 18.1 has been reviewed by the Procuring Authorities.

Detailed ATC 18.1 requests modifications to the normal crown cross slope design criteria of 2% with a centerline crown (2% cross slope) for cross street bridges over I-70 through the Lowered Section.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. CCD has reviewed and provided preliminary acceptance of this ATC but a Technical Variance request shall be submitted by KMP and approved by CCD once final design is complete. As part of the variance and design review process, KMP must illustrate to CCD that the following design elements are met:
  - a. Longitudinal slopes, modified cross slopes, curb heights, inlet locations, pavement thickness, etc. on the local roadways will work together such that the street will meet minimum CCD drainage design criteria.
  - b. No reduced curb heights.
  - c. The streets transition properly between approaching cross sections with standard crowns and the proposed cross-slope configurations.



- d. Proposed cross-slopes will allow for acceptable snow plowing and O&M conditions over the long term for CCD.
- e. ADA is still met with the modified cross-slopes.







# Central 70 Project

Alternative Technical Concept Submission

ATC 18.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** May 13, 2016

**Central 70 Project RFP: ATC Submission No. 18.1**

**Modified Cross Slopes on Cross Streets**

### A. Background Information

1. Type of Submission

- Conceptual ATC  
 Detailed ATC

2. Prior Submission

- None (initial submission of ATC)  
 Previously Submitted as Conceptual ATC  
 Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Requested to be resubmitted as Detailed ATC

4. Request for Discussion at One-on-One Meeting

- Meeting Requested  
 Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

Kiewit-Meridiam Partners (KMP) requests modifications to the normal crown cross slope design criteria of 2% with a centerline crown (2% cross slope) for cross street bridges over I-70 through the Lowered Section. This will raise the profile of I-70 mainline approximately 6 to 12 in. The three requested cross slopes modifications include:

- **Case A (Figure 1):** 1% normal crown cross slope
- **Case B (Figure 2):** Compound cross slope; 1% normal crown for left turn lanes, 2% cross slope for through lanes
- **Case C (Figure 3):** 2% reverse crown cross slope

As shown on **Figure 4**, the modified cross slope for the cross street pavement will begin at the curb returns on the south side of 46<sup>th</sup> Ave South and end at the curb returns on the north side of 46<sup>th</sup> Ave North with transitions back to the 2% normal crown beyond these limits.

### ATC 18.1 Benefits

- ✓ Raises I-70 profile through the Lowered Section
- ✓ Reduces area of retaining walls and volume of excavation
- ✓ Reduces groundwater impacts
- ✓ Reduces traffic and community impacts
- ✓ Provides smoother ride on local streets

## 2. Relevant RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

KMP requests variances to the following cross slope requirements for cross streets in the Project Agreement Schedule 10 Section 9.4.9.a.i., Schedule 10 Section 9 Appendix A Roadway Design Criteria; Schedule 10B.10.9.01 Roadway Typical Sections; and Schedule 10B.10.13.01 Structure Typical Sections.

## 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC.

The use of the proposed modified cross slopes raises the elevation of the outside girders that is the control point of minimum vertical clearance and will raise the I-70 profile approximately 6 to 12 in. throughout the Lowered Section. This will result in both a decrease in the surface area of retaining walls and the total volume of excavation within the Lowered Section. This ATC furthers KMP's objective of raising the I-70 mainline profile from the UPRR Crossing to Columbine St. to reduce the groundwater impacts to the Project both during construction and during long term maintenance.

This ATC will be implemented at the following locations as shown in **Attachment A**:

- **Case A (Figure 1):** York St.; Josephine St.; Steele St.; and Cook St.
- **Case B (Figure 2):** Colorado Blvd.
- **Case C (Figure 3):** Clayton St.; Columbine St.; Fillmore St.; and Monroe St.

This ATC directly aligns with the following Project Goals:

- **Optimize the Scope:** The raised profile of the I-70 mainline results in several optimizations including decreased retaining wall area and volume of excavation. Raising the profile on I-70 mainline also allows for significant savings to pump, treat, and dispose of groundwater during the construction period.
- **Optimize Operating and Life Cycle Costs:** The airflow under the cover is improved with the incorporation of this ATC at Columbine St. and Clayton St. which optimizes the operations of cover ventilation. Maintenance costs will be optimized throughout the operations and maintenance period by reducing the need for long term management of groundwater in the Lowered Section.
- **Minimize impacts to the traveling public:** MOT/Phasing is improved at Colorado Blvd. by allowing I-70 traffic to remain on existing pavement by revising the ramp profiles and raising Colorado Blvd. Additionally, upon completion, vehicular and bicycle traffic will have a smoother ride along 46<sup>th</sup> Ave. North and South due to the reduction in grade break from 4% to 2% at the centerline of each cross street.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

The proposed modifications to the cross slopes are limited to short distances on cross streets across the Lowered Section, as shown in **Figure 4 on Attachment A**. These are localized modifications, and therefore will not result in any negative impacts. KMP evaluated stormwater drainage spread requirements and determined that the modified cross slopes will meet these requirements. Drainage will flow generally from the SE to the NW, and all cross street drainage will be collected on the south side of the intersections. There is adequate drainage capacity in the curbs and street to manage the stormwater through the modified cross slope limits.

There are several positive impacts associated with modifying the cross slopes, including:

- Construction phasing and maintenance of I-70 traffic is improved near Colorado Blvd. by allowing I-70 traffic to remain on existing pavement under the proposed Colorado Blvd. Bridge. This is achieved by raising the vertical constraints for the Colorado Blvd. EB exit ramp under Monroe St. allowing the ramp profile to gain additional elevation by Colorado Blvd. **(Figure 5)**
- The modified profile on the bottom of the cover will provide a smoother transition to facilitate jet fan air flow through the covered section. **(Figure 6)**
- Elimination and reduction in the height and length of landscaping walls located at the back of sidewalks in locations with tight right-of-way constraints. These walls will be eliminated/reduced by raising the sag vertical curves approaching and departing each cross street in order to tie in with the cross street cross slope. **(Figure 7)**
- Elimination/reduction of landscaping walls will produce a more visually appealing view along the local roads.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

Initial cost analysis indicates a savings of approximately \$600,000. This savings is based on reduction in heights of the retaining walls along both sides of I-70, reduced excavation within the lowered section, and landscaping walls.

The cost benefit analysis does not include additional savings associated with minimizing the removal and treatment of groundwater.

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

Activity durations associated with for the reduction in retaining walls and reduced excavation will be shortened but the overall effect on the construction schedule will be minimal.

## 7. Conceptual Drawings

This information *has not been* amended since the submission of the previous version of this ATC.

See **Attachment A** for **Figures 1** through **7**.

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

Proposed **Case A** is similar to warping pavement cross slopes at local streets intersections. Cross slopes are flattened to provide a smooth transition for both cross streets while maintaining positive drainage and meeting all ADA criteria for crosswalks and ramps. Due to the short distance between 46<sup>th</sup> Ave. South and 46<sup>th</sup> Ave. North, in combination with this stretch being constructed on a bridge, the proposed constant 1% normal crown best fits the constraints of the area.

Proposed **Case B** is similar to the I-15/7200 South interchange in Salt Lake City, UT. 7200 South is an arterial with a similar width to Colorado Blvd. 7200 South was constructed with the same compound cross slope as proposed in this ATC. Due to the nature of a single point urban interchange, the smoother profile was provided for the heavy left turn traffic utilizing the interchange. The smoother profile will be provided to the through traffic of the proposed diamond interchange at Colorado Blvd.

Proposed **Case C** is similar to the I-15/12<sup>th</sup> St. interchange in Ogden, UT. 12<sup>th</sup> St. was constructed with a 2% reverse crown slope on a tangent horizontal alignment to facilitate the ramp profile geometry to meet vertical clearance over the UPRR spur line located just south of 12<sup>th</sup> St. While our proposed use has the roadways flipped in elevation with Monroe St. over I-70, the same logic applies.

## 9. Additional Information

This information *has not been* amended since the submission of the previous version of this ATC.

No additional information has been identified for inclusion.

## C. Detailed ATC Requirements

### 1. Risks

There are no risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with implementation of this ATC.

### 3. Right-of-Way

No additional right-of-way is expected to be required to implement this ATC.

### 4. List of Required Approvals

No new approvals are expected to be required to implement this ATC.



## 5. Proposed Drafting Revisions

### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for the exclusive use by KMP upon acceptance of this ATC.

- Section 9 of Schedule 10 (Design and Construction Requirements) of the Project Agreement
  1. 9.4.9.a.i
  2. Appendix A
- Schedule 10B (Contract Drawings) of the Project Agreement
  1. 10.9.01 Roadway Typical Sections
  2. 10.13.01 Structure Typical Sections

### b) Proposed Revisions to address Inconsistencies

KMP has included the following attachments with tracked changes for the changes in the sections listed above.

- Section 9 of Schedule 10 (Design and Construction Requirements) of the Project Agreement as shown in **Attachment B**
- Schedule 10B (Contract Drawings) of the Project Agreement **Roadway Typical Sections** as shown in **Attachment C**
- Schedule 10B (Contract Drawings) of the Project Agreement **Structure Typical Sections** as shown in **Attachment D**

This attachment *has not been* amended since the submission of the previous version of this ATC.

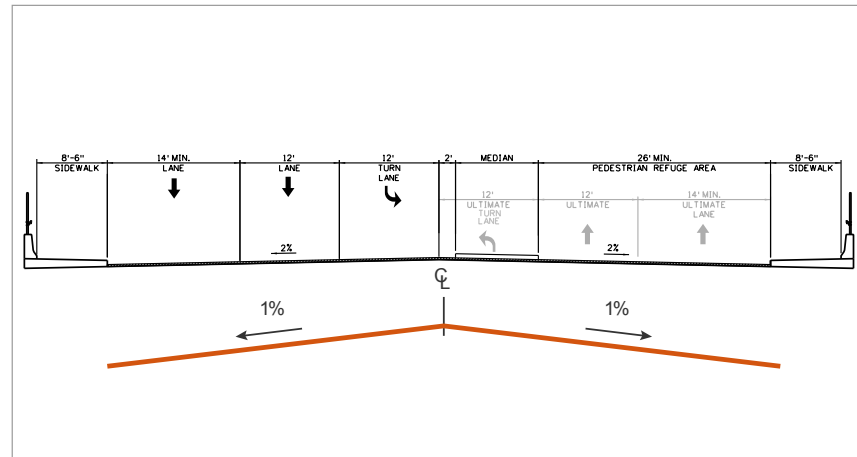


Figure 1 – Case A, 1% normal crown cross slope (York St. shown, others similar)

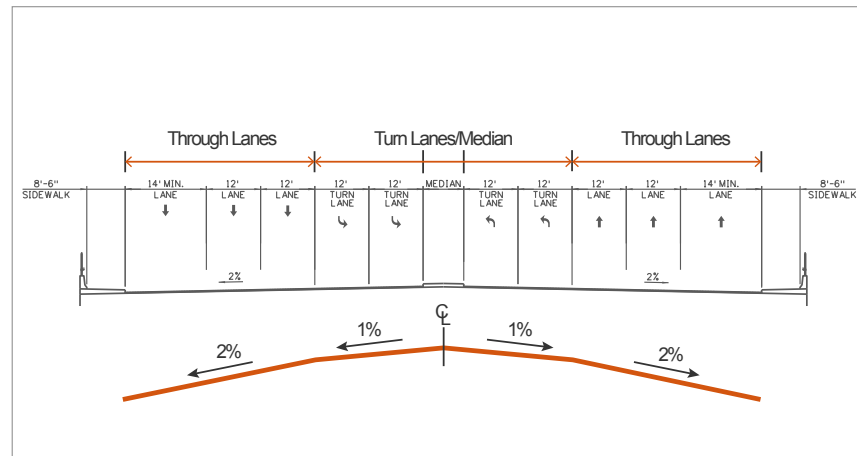


Figure 2 – Case B, compound cross slope @ Colorado Blvd.

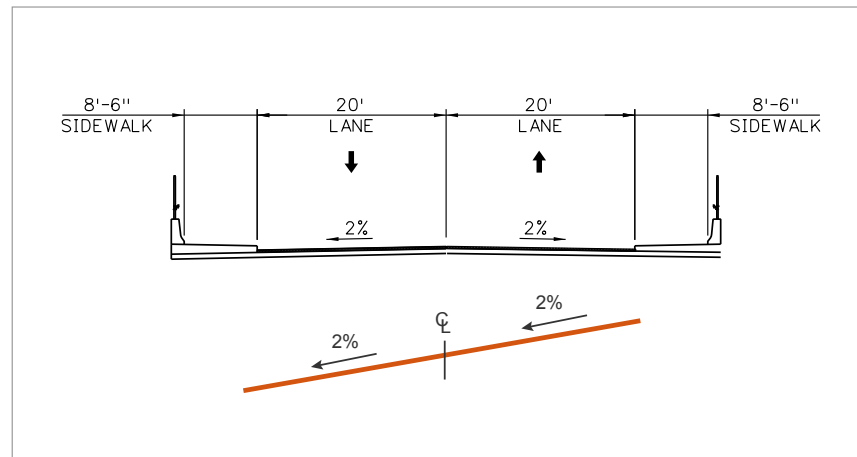


Figure 3 – Case C, 2% cross slope (Monroe shown, others similar)

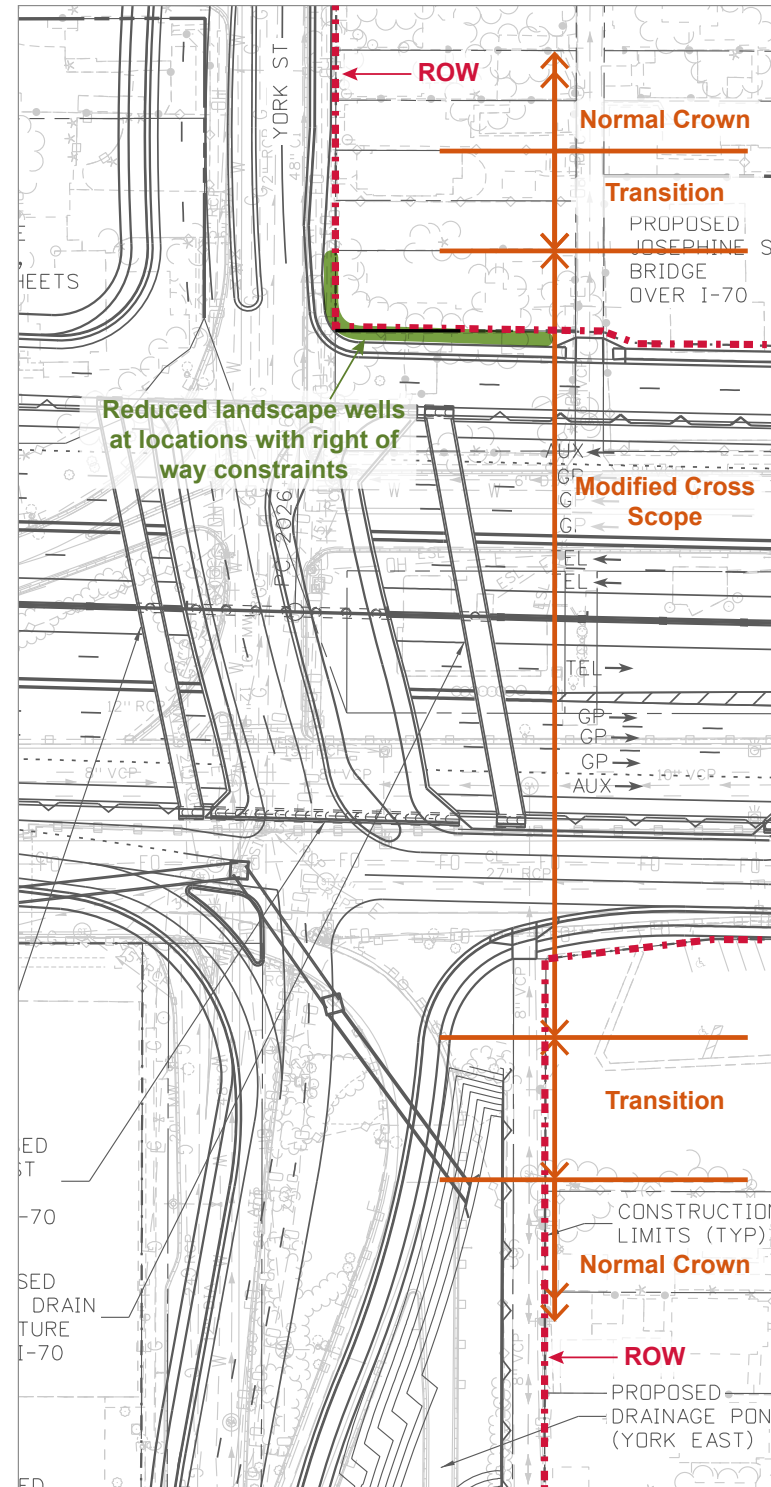


Figure 4 – Typical cross street cross slope plan (York St. shown, others similar)

This attachment *has not been* amended since the submission of the previous version of this ATC.

Figure 5 – Colorado Blvd., EB Exit Ramp Roadway Profile

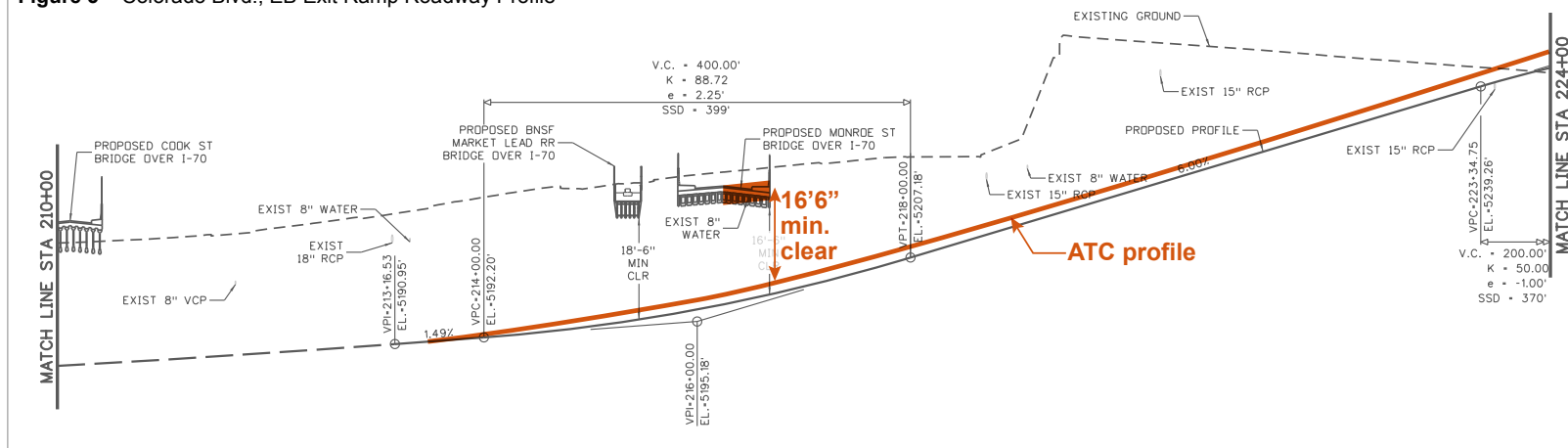


Figure 6 – I-70 Roadway Profile

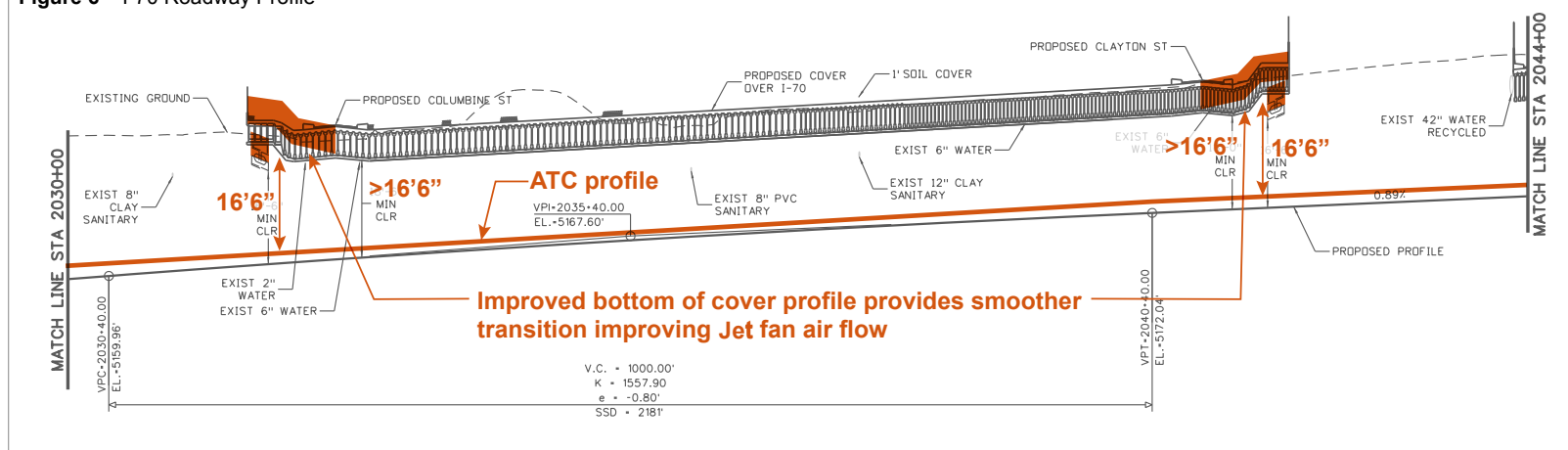
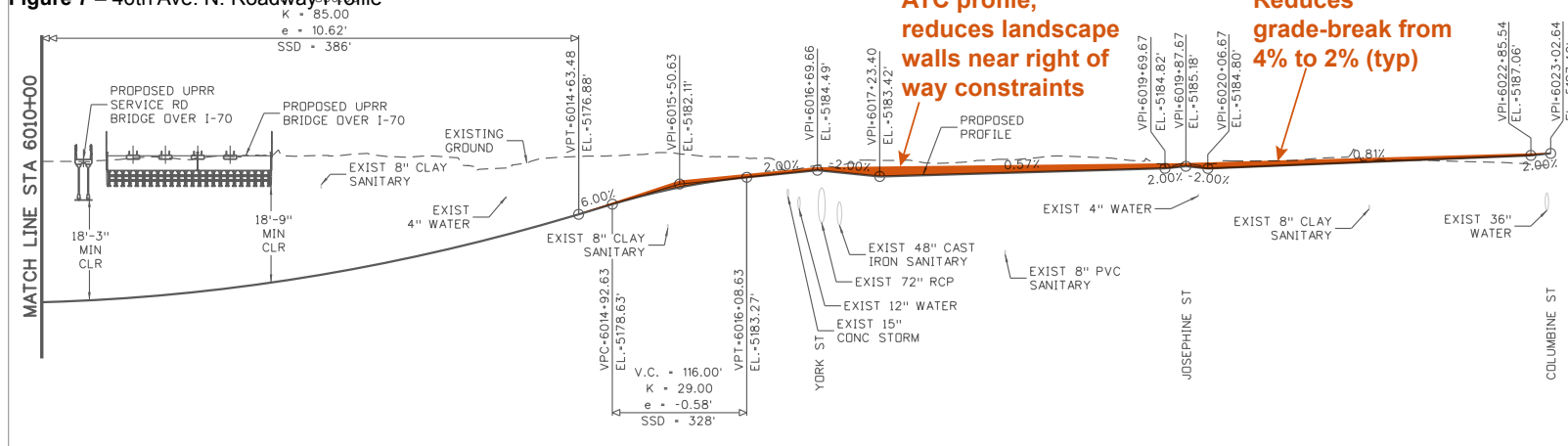


Figure 7 – 46th Ave. N. Roadway Profile



REFERENCE	SECTION	PAGE
4	IMPACTS	3
7	CONCEPTUAL DWGS	3

ALTERNATIVE TECHNICAL CONCEPT  
**MODIFIED CROSS SLOPES ON  
 CROSS STREETS**

ATTACHMENT A

ATC NUMBER  
**18.1**

SHEET NUMBER 2 OF 2



# Central 70 Project

Attachment B – Tracked Changes to Section 9 of Schedule 10

ATC 18.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

May 13, 2016



**9. Roadway**

**9.4. Construction Work Requirements**

9.4.9. Cross Slope and Superelevation

a. Normal Cross Slope

- i. All new and reconstructed pavement sections expect as otherwise approved shall have a normal cross slope of two percent;



**Appendix A  
 Roadway Design Criteria**

<u>Cross Street, Brighton Boulevard to Clayton Street</u>						
	<u>Brighton Boulevard</u>	<u>York Street</u>	<u>Josephine Street</u>	<u>Columbine Street</u>	<u>Clayton Street</u>	<u>Remarks</u>
Standards Applied	Denver	Denver	Denver	Denver	Denver	
<b>General</b>						
Roadway Classification	4-lane Principal Arterial	2-lane Minor Arterial	2-lane Minor Arterial	2-lane Local	2-lane Collector	
Posted Speed Limit (MPH)	35	30	30	25	25	
Design Speed (MPH)	35	35	35	30	30	
Design Vehicle	WB-67	WB-67	WB-67	SU-30	SU-30	
<b>Horizontal Alignment Criteria</b>						
Curve Radius (Feet) - Minimum	510	510	510	333	333	
Stopping Sight Distance at Design Speed (Feet) - At level grade	250	250	250	200	200	
Cross Slope	2%	2% <sup>7</sup>	2% <sup>7</sup>	2% <sup>8</sup>	2% <sup>8</sup>	
Superelevation (e max)	NC	NC	NC	NC	NC	
Clear Zone (Feet)						
Minimum	N/A	N/A	N/A	N/A	N/A	
Desirable	N/A	N/A	N/A	N/A	N/A	
Minimum Lane Widths (Feet) – to edge of pan <sup>4, 5</sup>	11	12	12	14	18	
<b>Vertical Alignment Criteria</b>						
K-Values						
Crest Vertical Curve	29	29	29	19	19	
Sag Vertical Curve	49	49	49	37	37	
Grade						
Maximum	6%	6%	6%	6%	6%	
Minimum <sup>6</sup>	0.7%	0.7%	0.7%	0.7%	0.7%	
<b>Vertical Clearance at Structures - Minimum</b>						
Highways/Streets Over Highway/Street	16'-6"	16'-6"	16'-6"	16'-6"	16'-6"	

<u>Cross Street, Brighton Boulevard to Clayton Street</u>						
	<u>Brighton Boulevard</u>	<u>York Street</u>	<u>Josephine Street</u>	<u>Columbine Street</u>	<u>Clayton Street</u>	<u>Remarks</u>
UPRR/BNSF under Highway/Street	23'-4"	23'-4"	23'-4"	23'-4"	23'-4"	
UPRR/BNSF over Highway/Street <sup>1</sup>	16'-6"	16'-6"	16'-6"	16'-6"	16'-6"	
UPRR/BNSF over Highway/Street <sup>2</sup>	17'-6"	17'-6"	17'-6"	17'-6"	17'-6"	
UPRR/BNSF over Highway/Street <sup>3</sup>	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	
Overhead Wires	21'-6"	21'-6"	21'-6"	21'-6"	21'-6"	
Pedestrian/Utilities/Sign Structures over Highway/Street	17'-6"	17'-6"	17'-6"	17'-6"	17'-6"	
Bridge Structure over Sidewalk	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	

1 - Steel superstructure with 5 or more beams or 4 or more deck plate girders per track

2 - Concrete superstructure or steel through plate girder with bolted bottom flanges

3 - Steel through plate girders without bolted bottom flanges

4 - Lane widths on bridge structures shall be in accordance with the Structure Typical Sections provided in Schedule 10B Contract Drawings

5 - Provide for on-street parking per CCD Standard 5.1

6 - Local Agency Roadways shall provide a minimum grade of 0.7%, though flatter grades of no less than 0.5% may be approved at the discretion of the Public Works Engineering, Regulatory & Analytics Office within CCD

7 – 1% normal crown cross slope between 46<sup>th</sup> South and 46<sup>th</sup> North

8 – 2% reverse crown cross slope between 46<sup>th</sup> South and 46<sup>th</sup> North

<b>Cross Street, Fillmore Street to Colorado Boulevard</b>						
	<u>Fillmore Street</u>	<u>Steele Street/Vasquez Boulevard</u>	<u>Cook Street</u>	<u>Monroe Street</u>	<u>Colorado Boulevard</u>	<u>Remarks</u>
Standards Applied	Denver	CDOT/FHWA	Denver	Denver	CDOT/FHWA	
<b>General</b>						
Roadway Classification	2-lane Local	4-lane Minor Arterial	2-lane Local	2-lane Collector	6-lane Principal Arterial	
Posted Speed Limit (MPH)	25	25	25	15	40	
Design Speed (MPH)	30	35	30	20	45	
Design Vehicle	SU-30	WB-67	SU-30	WB-67	WB-67	
<b>Horizontal Alignment Criteria</b>						
Curve Radius (Feet) - Minimum	333	510	333	107	1,039	
Stopping Sight Distance at Design Speed (Feet) - At level grade	200	250	200	115	360	
Cross Slope	2% <sup>9</sup>	2% <sup>7</sup>	2% <sup>7</sup>	2% <sup>9</sup>	2% <sup>8</sup>	
Superelevation (e max)	NC	NC	NC	NC	NC	
Clear Zone (Feet)						
Minimum	N/A	N/A	N/A	N/A	20	
Desirable	N/A	N/A	N/A	N/A	22	
Minimum Lane Widths (Feet) – to edge of pan <sup>4, 5</sup>	14	12	18	18	12	
<b>Vertical Alignment Criteria</b>						
K-Values						
Crest Vertical Curve	19	29	19	7	61	
Sag Vertical Curve	37	49	37	17	79	
Grade						
Maximum	6%	6%	6%	6%	6%	
Minimum <sup>6</sup>	0.7%	0.5%	0.7%	0.7%	0.5%	
<b>Vertical Clearance at Structures - Minimum</b>						
Highways/Streets Over Highway/Street	16'-6"	16'-6"	16'-6"	16'-6"	16'-6"	
UPRR/BNSF under Highway/Street	23'-4"	23'-4"	23'-4"	23'-4"	23'-4"	
UPRR/BNSF over Highway/Street <sup>1</sup>	16'-6"	16'-6"	16'-6"	16'-6"	16'-6"	
UPRR/BNSF over Highway/Street <sup>2</sup>	17'-6"	17'-6"	17'-6"	17'-6"	17'-6"	

<u>Cross Street, Fillmore Street to Colorado Boulevard</u>						
	<u>Fillmore Street</u>	<u>Steele Street/Vasquez Boulevard</u>	<u>Cook Street</u>	<u>Monroe Street</u>	<u>Colorado Boulevard</u>	<u>Remarks</u>
UPRR/BNSF over Highway/Street <sup>3</sup>	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	
Overhead Wires	21'-6"	21'-6"	21'-6"	21'-6"	21'-6"	
Pedestrian/Utilities/Sign Structures over Highway/Street	17'-6"	17'-6"	17'-6"	17'-6"	17'-6"	
Bridge Structure over Sidewalk	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	

- 1 - Steel superstructure with 5 or more beams or 4 or more deck plate girders per track
- 2 - Concrete superstructure or steel through plate girder with bolted bottom flanges
- 3 - Steel through plate girders without bolted bottom flanges
- 4 - Lane widths on bridge structures shall be in accordance with the Structure Typical Sections provided in Schedule 10B Contract Drawings
- 5 - Provide for on-street parking per CCD Standard 5.1
- 6 - Local Agency Roadways shall provide a minimum grade of 0.7%, though flatter grades of no less than 0.5% may be approved at the discretion of the Public Works Engineering, Regulatory & Analytics Office within CCD
- 7 – 1% normal crown cross slope between 46<sup>th</sup> South and 46<sup>th</sup> North
- 8 – Compound cross slope, 1% normal crown for left turn lanes, 2% cross slope for through lanes
- 9 – 2% reverse crown cross slope between 46<sup>th</sup> South and 46<sup>th</sup> North



# Central 70 Project

ATC 18.1

Attachment C – Tracked Changes to Schedule 10B Roadway Typical Sections



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation

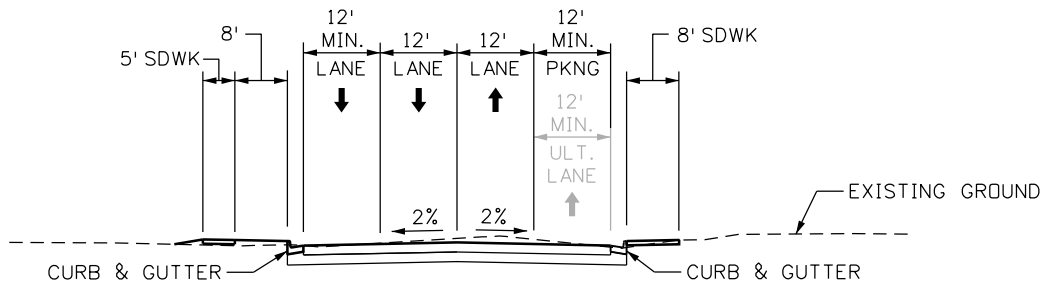


Detailed ATC Submission

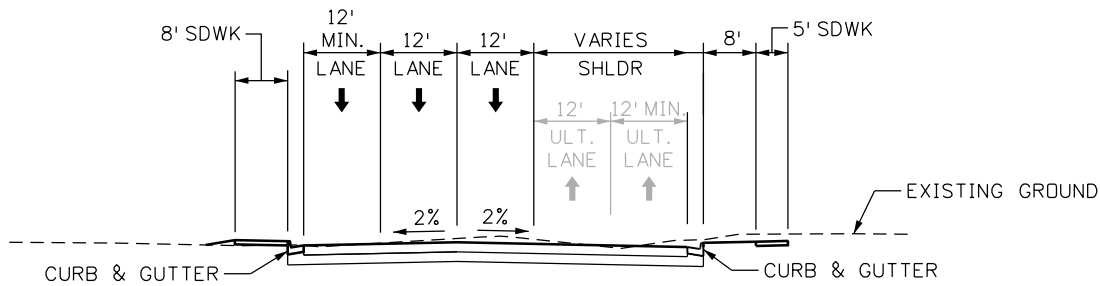
May 13, 2016



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**YORK ST**  
NORTH OF I-70 MAINLINE  
(SEE NOTE 1)



**YORK ST**  
SOUTH OF I-70 MAINLINE  
(SEE NOTE 1)

**NOTE:**  
1. 1% NORMAL CROWN CROSS SLOPES AS APPROVED BETWEEN 46TH AVE SOUTH AND 46TH AVE NORTH.

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<b>ATKINS</b>	7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



2000 South Holly Street  
Denver, CO 80222  
Phone: 303-757-9934 FAX: 303-757-9907

Region 1 KJS

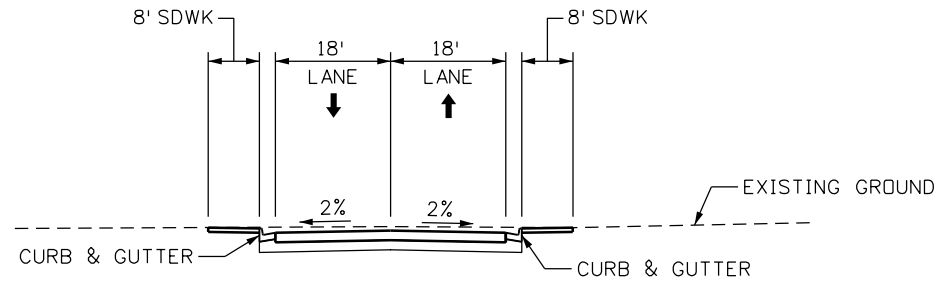
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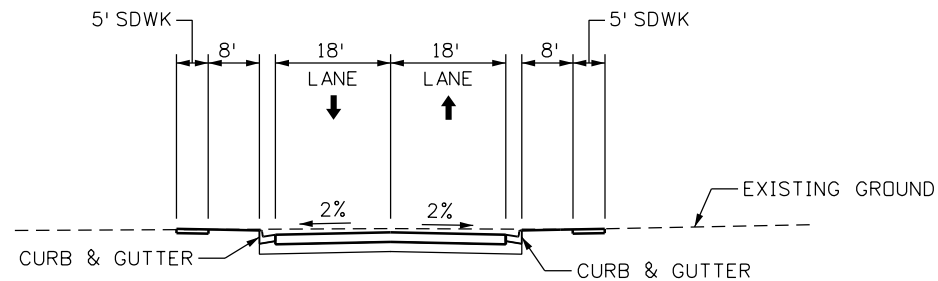
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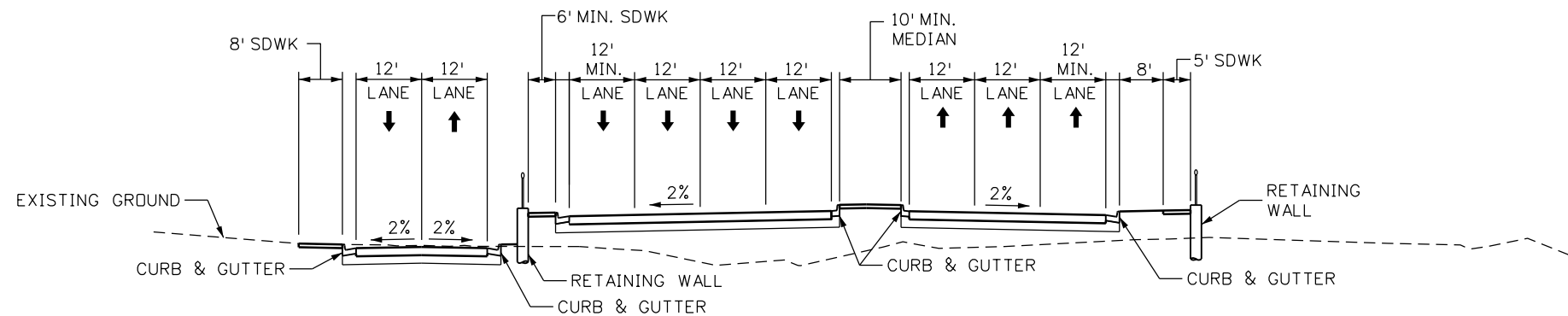
**COOK ST**  
(SEE NOTE 1)



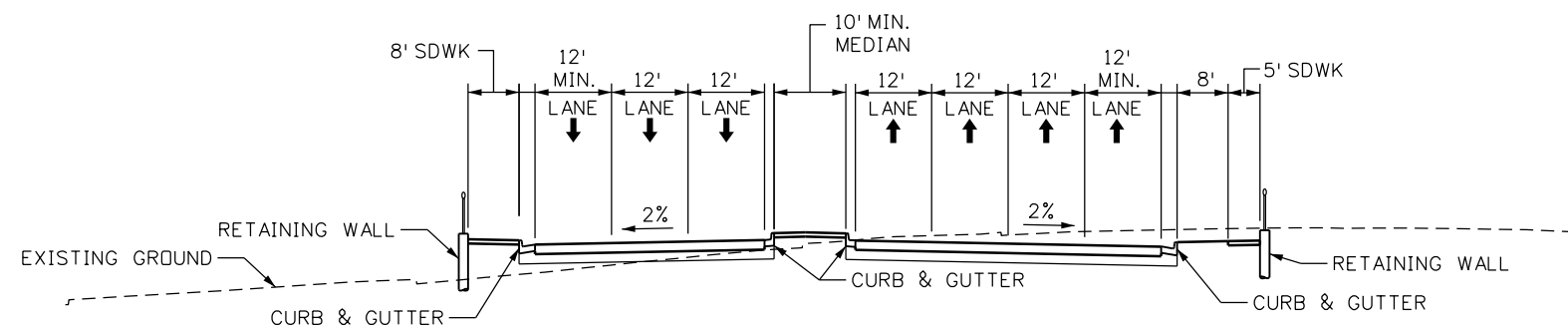
**MONROE ST**  
(SEE NOTE 2)

- NOTE:**
1. 1% NORMAL CROWN CROSS SLOPES AS APPROVED BETWEEN 46TH AVE SOUTH AND 46TH AVE NORTH.
  2. 2% REVERSE CROWN CROSS SLOPE AS APPROVED BETWEEN 46TH AVE SOUTH AND 46TH AVE NORTH.

Print Date: 2/12/2016		<b>Sheet Revisions</b>				<b>PRELIMINARY</b>		<b>COOK ST AND MONROE ST TYPICAL SECTIONS</b>		<b>Project No./Code</b>	
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Unit Information      Unit Leader Initials						Void:	Detailer:	Sheet Subset: Rdwy TypI	Subset Sheets: 10 of 17	Sheet Number	10
7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Colorado Department of Transportation 2000 South Holly Street Denver, CO 80222 Phone: 303-757-9934 FAX: 303-757-9907 Region 1      KJS							



**COLORADO BLVD**  
NORTH OF I-70  
(SEE NOTE 1)




**COLORADO BLVD**  
SOUTH OF I-70  
(SEE NOTE 1)

**NOTE:**  
1. COMPOUND CROSS SLOPE (1% NORMAL CROWN FOR LEFT TURN LANES, 2% CROSS SLOPE FOR THROUGH LANES) AS APPROVED BETWEEN 46TH AVE NORTH AND 46TH AVE SOUTH.

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<b>Project No./Code</b>	
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19631	
Sheet Number	11



# Central 70 Project

Attachment D – Tracked Changes to Schedule 10B Structure Typical Sections

ATC 18.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



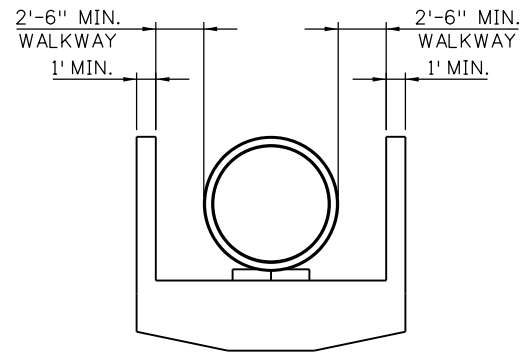
Detailed ATC Submission

May 13, 2016

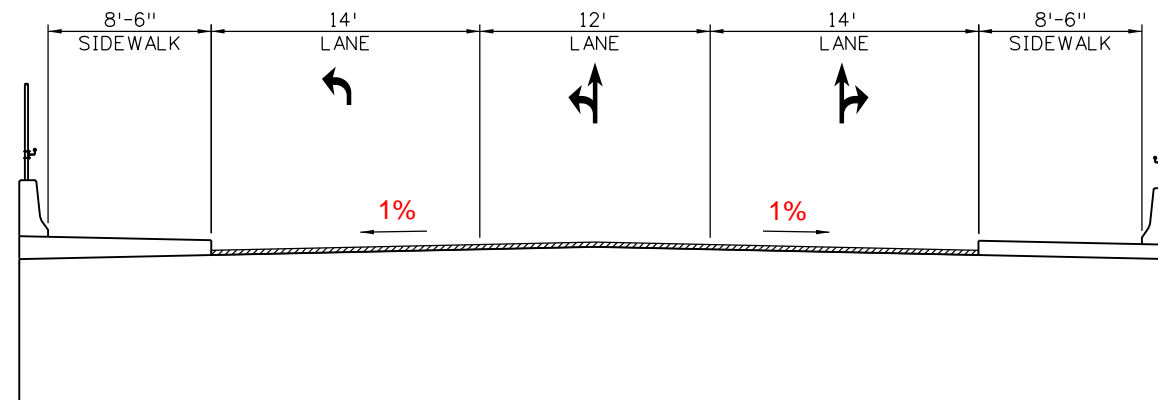




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**STORM SEWER BRIDGE OVER I-70 MAINLINE**  
(STR. NO. MISC-E-17-IU)



**JOSEPHINE STREET OVER I-70**  
(STR. NO. E-17-AEZ)

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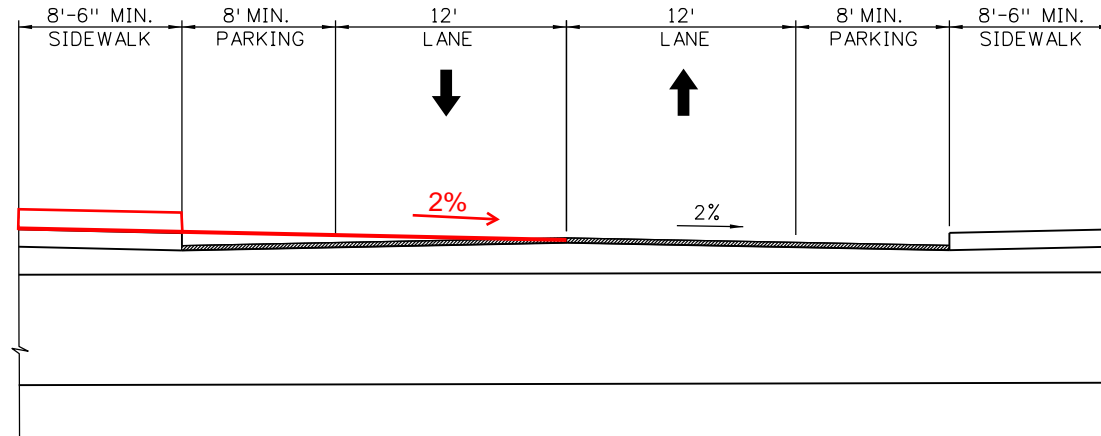
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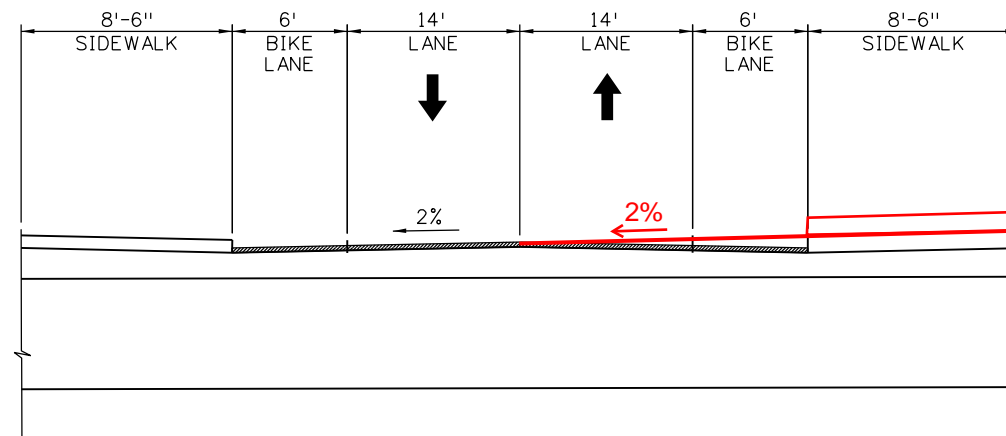
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**COLUMBINE STREET ON COVER**  
(STR. NO. E-17-AEL)



**CLAYTON STREET ON COVER**  
(STR. NO. E-17-AEL)

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Unit Leader Initials	
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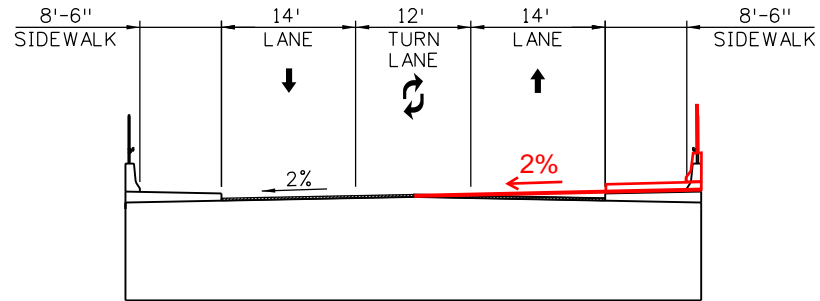
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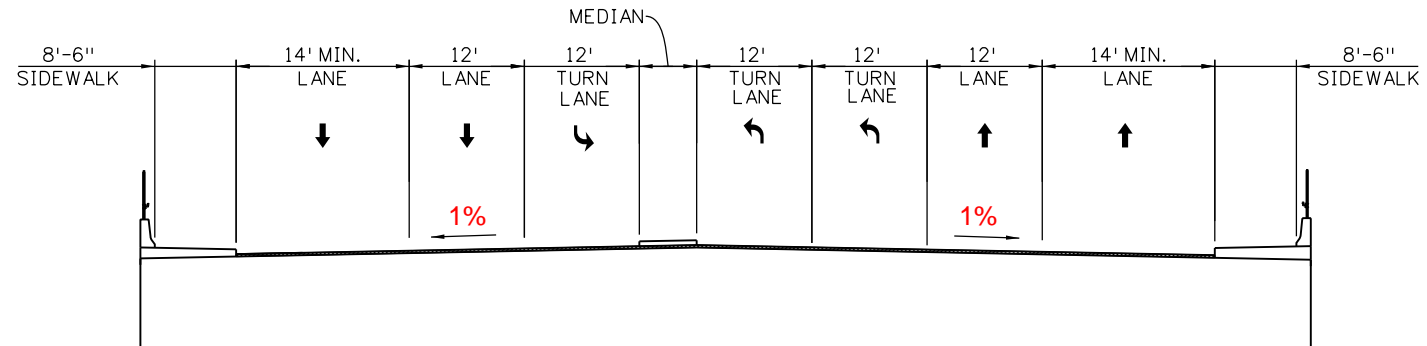
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**FILLMORE STREET OVER I-70 MAINLINE**  
(STR. NO. E-17-AEN)



**STEELE STREET OVER I-70 MAINLINE**  
(STR. NO. E-17-AEO)

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Region 1 KJS

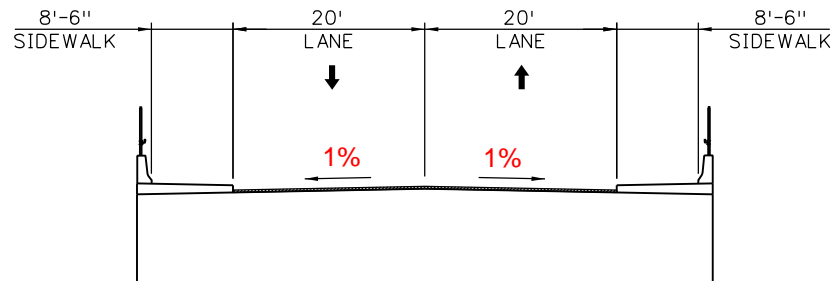
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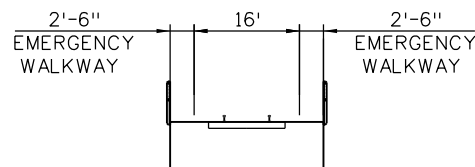
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**COOK STREET OVER I-70 MAINLINE**  
(STR. NO. E-17-AEP)



**BNSF MARKET LEAD OVER I-70 MAINLINE**  
(STR. NO. E-17-AFA)

Print Date: 2/17/2016	
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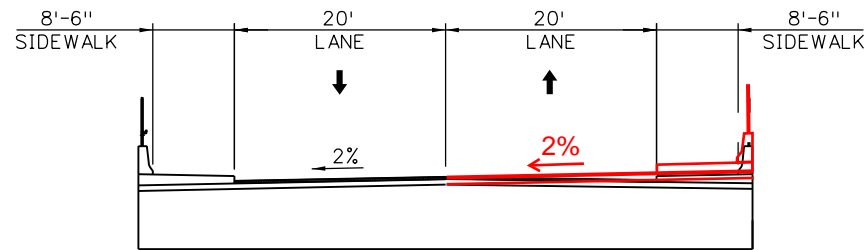
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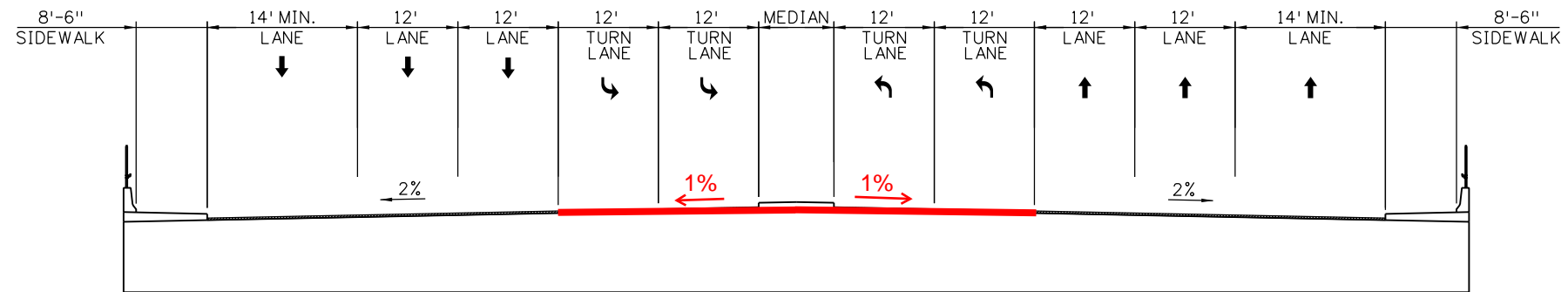
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**MONROE STREET OVER I-70 MAINLINE**  
(STR. NO. E-17-AFC)



**COLORADO BOULEVARD OVER I-70 MAINLINE**  
(STR. NO. E-17-AFD)

Print Date: 2/17/2016	
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Date:	Comments	Init.

**Colorado Department of Transportation**  

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**Region 1** **KJS**

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Detailer:			
Sheet Subset: 10B Struct	Subset Sheets: 08 of 12		

<b>Project No./Code</b>	
FBR 0704-234	
19631	
Sheet Number	<b>8</b>



DATE: August 4, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 28.1

Dear Mr. John Dionisio:

Your Team's ATC Submission Form for Detailed ATC 28.1 has been reviewed by the Procuring Authorities.

Detailed ATC 28.1 proposes optimized geometric design of the I-270 EB Connector to reduce the inside shoulder width from 9 ft. to 6 ft. on the flyover bridge while maintaining the required horizontal stopping sight distance along I-270.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. The inside shoulder width across the bridge shall be a consistent width. The inside shoulder width off the bridge for the remainder of the ramp shall be a consistent width.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

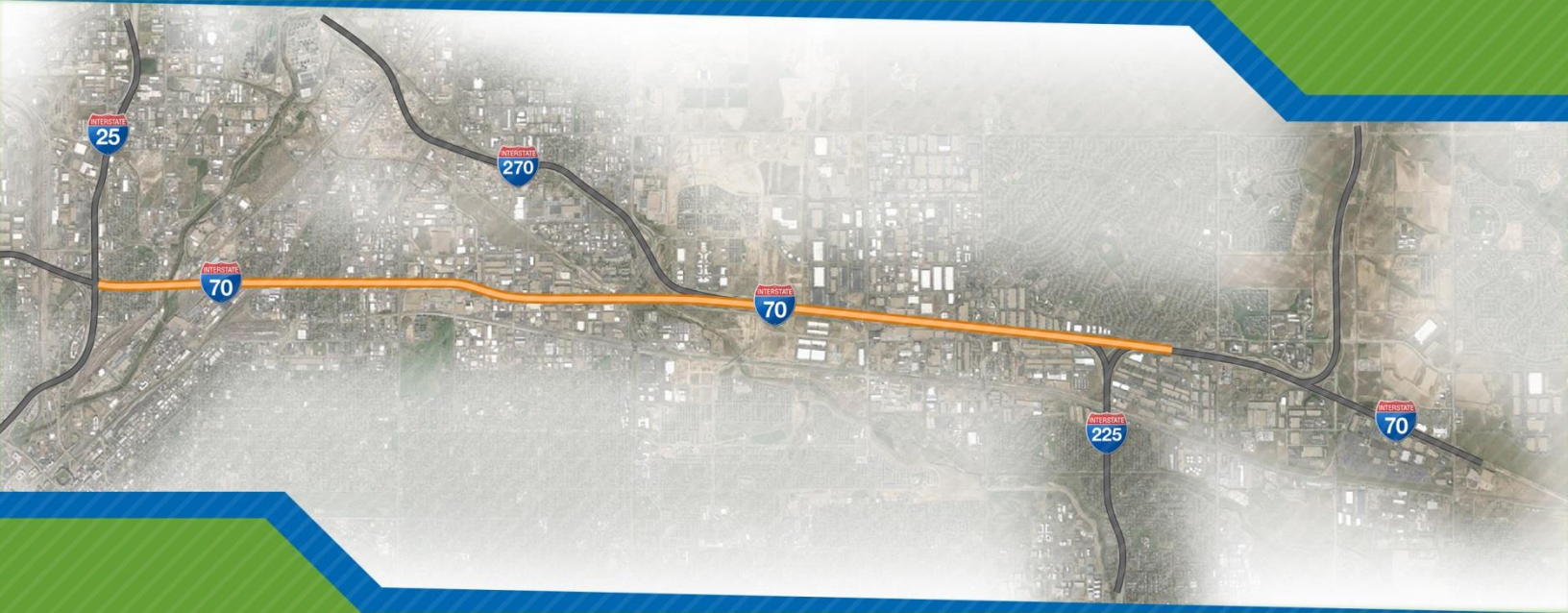




# Central 70 Project

Alternative Technical Concept Submission

ATC 28.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 28.1**

**I-270 EB Connector Inside Shoulder Width**

### ATC 28.1 Benefits

- ✓ Lower initial construction costs
- ✓ Lower future maintenance costs
- ✓ Equal or better performance and reliability
- ✓ Optimizes Scope through use of Practical Design
- ✓ Maintains reliable travel speeds
- ✓ Reduces overall construction schedule by one month

### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
Address Department Comments on Conceptual
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

Kiewit-Meridiam Partners (KMP) is proposing an optimized geometric design of the I-270 Eastbound (EB) Connector to reduce the inside shoulder width from 9 ft. to 6 ft. on the flyover bridge while maintaining the required horizontal stopping sight distance (HSSD) for the traveling public along I-270. To achieve this, the flyover curve was flattened from a radius of 2,184 ft. to a radius of 2,590 ft. The proposed geometric adjustment not only allows the reduction of bridge deck area on the flyover bridge, but also allows the use of two girders instead of three for the entire bridge length. Similar to the Reference Design for this ramp, compound curves are utilized to tie back into the existing ramp alignment both north and south of I-70. KMP is also proposing to utilize a 4 ft. inside shoulder for the portions of the EB Connector where no barrier obstructs sight distance, which is consistent with the geometry provided with the Reference Design.



## 2. Relevent RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

KMP requests modifications to the following requirements of the PA:

- Schedule 10, Section 9, Appendix A – Roadway Design Criteria, I-270 EB Connector, Shoulder Widths, Inside: Change 9 ft. to 4 ft.
- Schedule 10B, 10B.10.9.01 Roadway Typical Sections, I-270 EB Connector Typical Sections: Label for inside shoulder states “9 FT. SHLDR. MIN.” Change 9 ft. to 4 ft.
- Schedule 10B, 10B.10.13.01 Structure Typical Sections, I-270 EB Connector of I-70 Mainline: Label for inside shoulder states “9 FT. MIN. SHLDR.” Change 9 ft. to 6 ft.

## 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC.

KMP has conducted a comprehensive evaluation of the proposed design of the I-270 EB Connector taking into account the numerous constraints including ramp geometry, HSSD, construction phasing, traffic impacts during construction, and permanent work scope quantities.

Schedule 10, Section 9.4.2.e.ii.A states "Provide an inside shoulder. The Developer shall provide the necessary inside shoulder width to ensure an acceptable horizontal sight distance;"

The proposed reduction of the inside shoulder from 9 ft. to 6 ft. on the flyover structure still maintains an acceptable horizontal sight distance. Where barrier does not obstruct the horizontal sight distance, a 4 ft. inside shoulder is sufficient, consistent with other two lane ramps on the Project and with the Central Park Blvd. interchange ramps.

The use of two concrete U-girders (four webs) for the flyover structure is considered a redundant structure; if one girder is damaged the bridge is still structurally stable. The use of two girders with the narrower bridge, as opposed to three U-girders, does not change the structural integrity of the flyover structure.

KMP's solution, as shown in **Attachment A**, provides the best fit considering all constraints and aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** Continuing to provide adequate HSSD is expected to reduce the number and severity of accidents significantly improving the public safety. The reduced quantities for bridge girders and deck will reduce KMP's workforce exposure to the hazards associated with working overhead and next to live traffic. A 10 ft. outside shoulder is still provided for breakdowns throughout the ramp length.
- **Optimization of Scope:** The proposed ramp and bridge alignment and width reduction requires fewer overall material quantities and construction resources than the Reference Design which contributes to a more sustainable Project.
- **Optimization of the Life Cycle Maintenance Costs:** The proposed reduction in bridge deck and number of girders will overall reduce long term maintenance costs.

- **Minimize Impacts to the Traveling Public, Businesses and nearby Communities:** The proposed design change will not increase or change impacts to the traveling public, businesses, or nearby communities.
- **Ensures Reliable Travel Speeds:** Providing adequate HSSD will reduce the number and severity of accidents and provide driver expectancy/comfort to maintain reliable travel speeds. During icy conditions with reduced pavement friction, the flatter curve allows a slightly higher maintainable travel speed and the lower superelevation rate slightly reduces the potential for vehicles sliding to the inside of the curve in low speed conditions.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

There is one potential negative impact associated with this ATC. The existing storm water detention pond at the southeast end of the ramp bridge was delineated as a low-functioning non-jurisdictional wetland. The Reference Design impacts this pond and associated permanent impacts to the wetland are shown in the FEIS as being to the face of the ramp fill retaining wall. KMP's proposed ATC design for this ramp will push this wall 4 ft.-8 ft. further into this wetland as shown in **Attachment A**, which will slightly increase the wetland impact due to the ramp itself.

KMP notes that the Reference Design Drainage Plans show that this pond and wetland is within the Sand Creek Overflow Channel, which is shown on the Plans to receive soil riprap lining through the length of the channel and through the wetland area. It is KMP's interpretation that this riprap lining would be considered a permanent impact to the entire pond and wetland which must then be mitigated. Therefore, since the entire pond is likely a permanent impact, the slight shift of the ramp into this area will not in effect cause an increased impact.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC will reduce quantities and construction cost associated with the bridge deck and bridge girders. A small increase in pavement quantities and striping will be needed at the north tie-in from the existing ramp.

Preliminary cost estimates indicate a construction cost savings of approximately \$800,000. Due to the reduced maintenance area, the O&M savings is estimated to be approximately \$200,000 over the term. **Total cost savings for this ATC is estimated to be approximately \$1,000,000.** Additional cost savings will be transferred back to the Department following Handback.

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

KMP initial preliminary schedule analysis indicates a **one month savings** to Project schedule.

## 7. Conceptual Drawings

This information *has not been* amended since the submission of the previous version of this ATC.

**Attachment A:** Plan view of the I-270 flyover area showing the proposed ATC design versus the Reference Design.

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

The use of two precast, post-tensioned spliced U-girders has been used for a majority of the new flyover ramps constructed in Colorado over the past dozen years. This use includes:

- I-25 to 270 EB Ramp K, first time used in Colorado in 2003
- E470 Ramp H, connector from E470 toll road to I-70
- 270 Ramp Y, connector from EB I-270 to EB I-76
- SH 58 Ramp A, connector from EB I-70 to WB SH 58
- Most recently at the Santa Fe Alameda Interchange on I-25

## 9. Additional Information

This information **has been** amended since the submission of the previous version of this ATC to address the Procuring Authorities' comments in response to Conceptual ATC No. 28.0.

### **ATC 28.0 Comment #1**

*Revise geometry to better align with AASHTO guidance. Specifically, page 3-112 of the AASHTO Green Book states, "However, the use of compound curves on ramps, with a flat curve between two sharper curves, is not good practice."*

### **KMP Response:**

The context of this statement in the AASHTO Green Book seems to be related to driver expectation and comfort. The following paragraph discusses concerns with broken back curves in general (two curves in the same direction separated by a relatively short piece of tangent). KMP's interpretation is that the AASHTO concern with having a flat curve between two sharper curves is to avoid geometry that is similar to a broken-back curve, i.e., transitioning from a longer sharper curve to a shorter flatter curve, and then back to a longer sharper curve at the end.

KMP's proposed design uses a relatively short, sharper entrance curve before transitioning to the longer flatter curve over the bridge. The short length of the entrance curve (<500 ft.) is similar to the normal sight distance of a motorist driving the ramp. Upon entering this curve, motorists are generally already looking ahead on the ramp to the flatter curve. KMP's assessment is that the short sharper entrance curve will be imperceptible to a typical motorist meaning no impact to driver expectation or comfort.

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

### 4. List of Required Approvals

No change in the approvals is required to implement this ATC.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

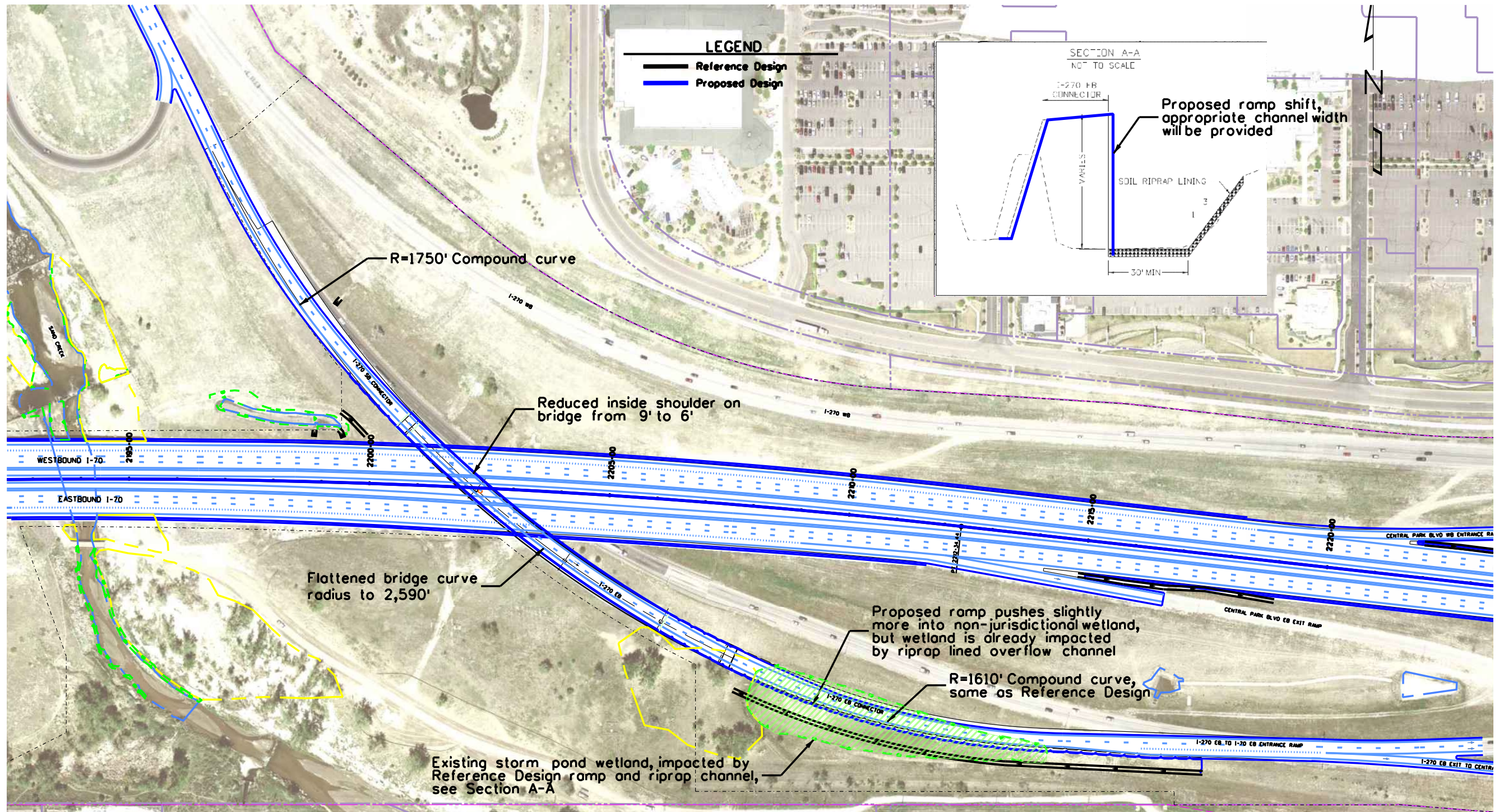
KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10 Section 9, Appendix A of the PA
2. Schedule 10B Section 10B.10.9.01 of the PA
3. Schedule 10B Section 10B.10.13.01 of the PA

#### b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment B** with tracked changes for the changes in the section listed above.





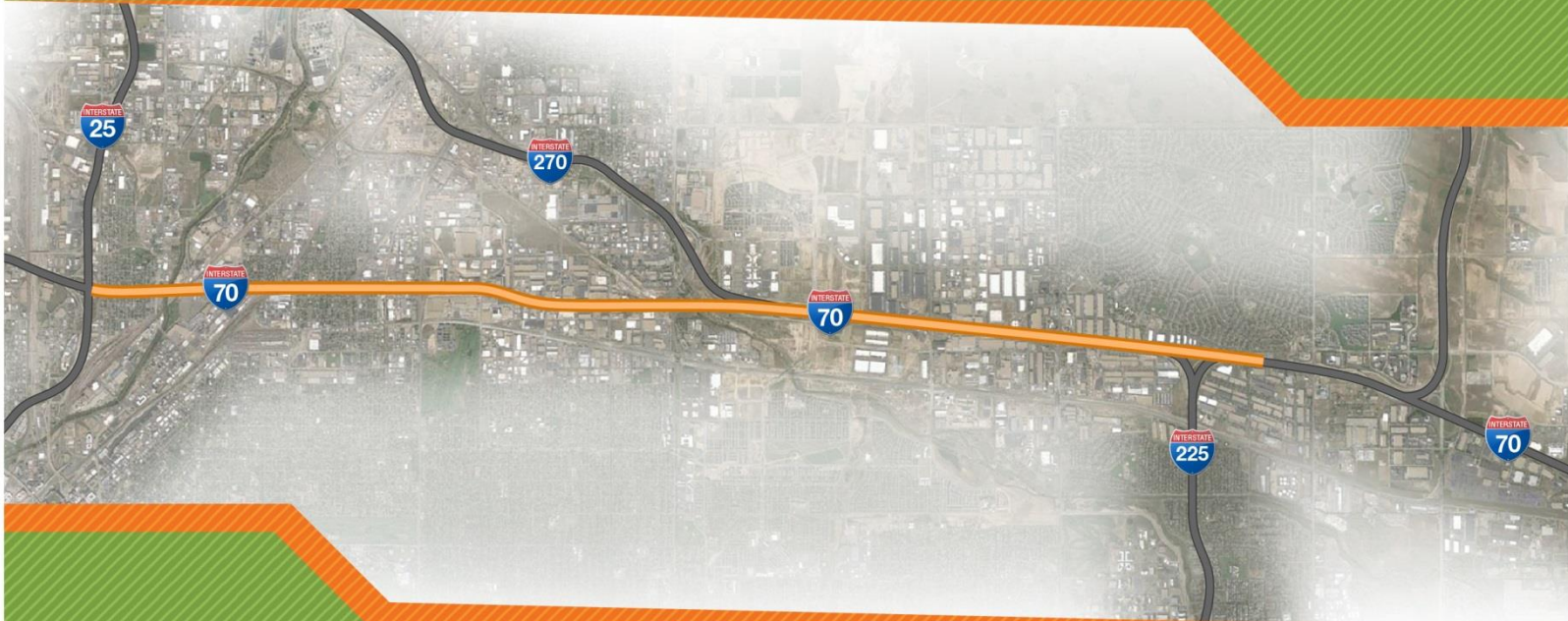
REFERENCE	SECTION	PAGE
B.3	RATIONALE	2
B.4	IMPACTS	3
B.7	CONCEPTUAL DWGS	4



# Central 70 Project

Attachment B – Tracked changes to Sections 9 and 10B of  
Schedule 10

ATC 28.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



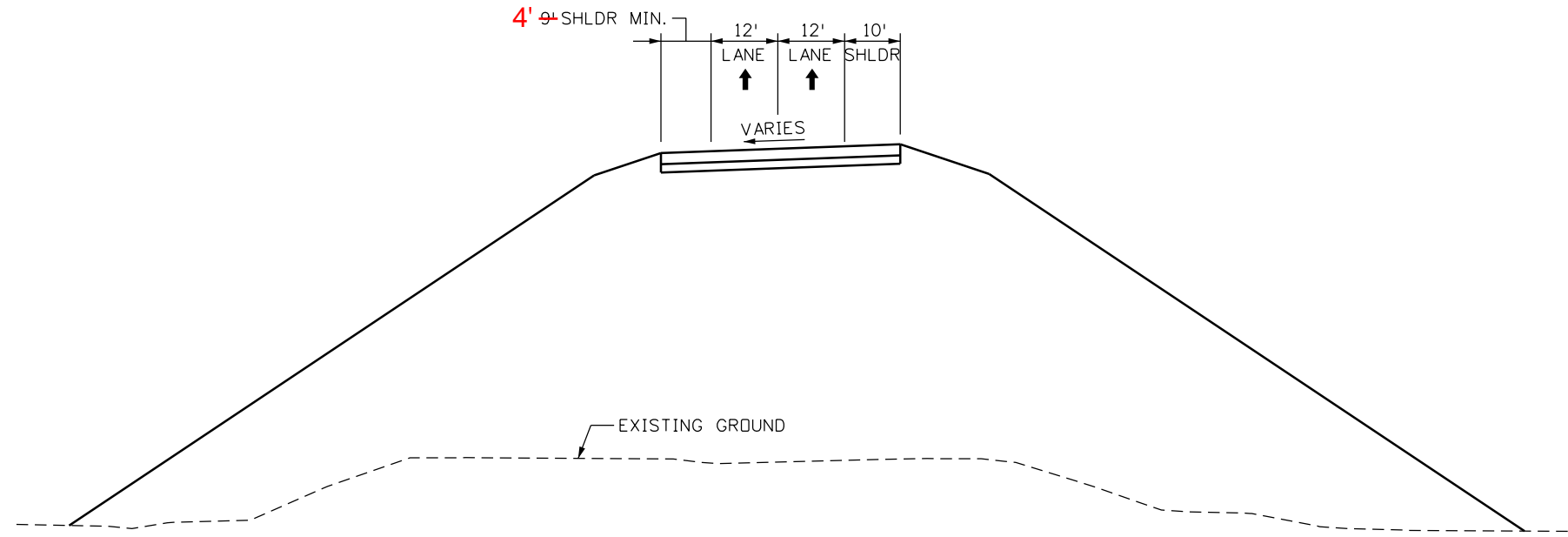
Detailed ATC Submission

July 14, 2016



I-270 and Central Park Boulevard Ramps							
Design Element	I-270 Eastbound Connector	Central Park Boulevard Westbound Entrance Ramp	Central Park Boulevard Eastbound Exit Ramp	I-70 Westbound To I-270 Ramp	Central Park Boulevard Eastbound Entrance Ramp	I-270 Eastbound to I-70 Eastbound Ramp	Remarks
Standards Applied	CDOT/FHWA						
<b>General</b>							
Roadway Classification	Ramp	Ramp	Ramp	Ramp	Ramp	Ramp	
Design Speed (MPH) (Ramp Proper)	55	55	55	55	55	55	
Design Vehicle	WB-67	WB-67	WB-67	WB-67	WB-67	WB-67	
EN-EX Ramp spacing on mainline (weave)	1,600	1,600	1,600	1,000	1,600	1,000	
<b>Horizontal Alignment Criteria</b>							
Curve Radius (Feet) - Minimum	1,060	1,060	1,060	1,060	1,060	1,060	
Stopping Sight Distance at Design Speed (Feet) - At level grade	495	495	495	495	495	495	
Cross Slope	2%	2%	2%	2%	2%	2%	
Superelevation ( e max)	6%	6%	6%	6%	6%	6%	
Clear Zone (Feet)							
Minimum	20	16	16	16	16	16	
Desirable	22	18	18	18	18	18	
Number of Lanes	2	1	1	2	1	2	
Lane Widths (Feet)	12+12	15	15	12+12	15	12+12	
Shoulder Widths (Feet)							
Inside	9.4	4	4	4	4	4	
Outside	10	6	8	8	6	10	
Side Slopes							
Cut Slope	Equal to or Flatter than 3:1	Equal to or Flatter than 3:1	Equal to or Flatter than 3:1	Equal to or Flatter than 3:1	Equal to or Flatter than 3:1	Equal to or Flatter than 3:1	
Fill Slope	Equal to or Flatter than 4:1 (H<15)	Equal to or Flatter than 4:1 (H<15)	Equal to or Flatter than 4:1 (H<15)	Equal to or Flatter than 4:1 (H<15)	Equal to or Flatter than 4:1 (H<15)	Equal to or Flatter than 4:1 (H<15)	
Z-slope Dist (6:1 Slope) (Feet)	12	12	12	12	12	12	

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**I-270 EB CONNECTOR**

Print Date: 2/12/2016	
File Name: 13599DES_Procurement_TypicalSect-16-Section 10B-I-270 Ramp.dgn	
Horiz. Scale: NTS	Vert. Scale: NTS
Unit Information	Unit Leader Initials
<b>ATKINS</b>	7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



2000 South Holly Street  
Denver, CO 80222  
Phone: 303-757-9934 FAX: 303-757-9907

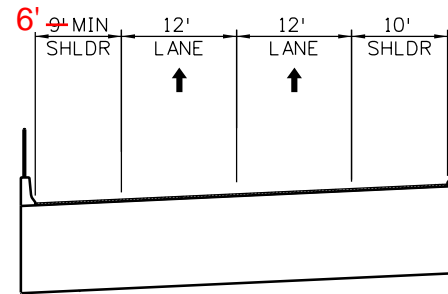
**Region 1** **KJS**

<b>PRELIMINARY</b>
No Revisions:
Revised:
Void:

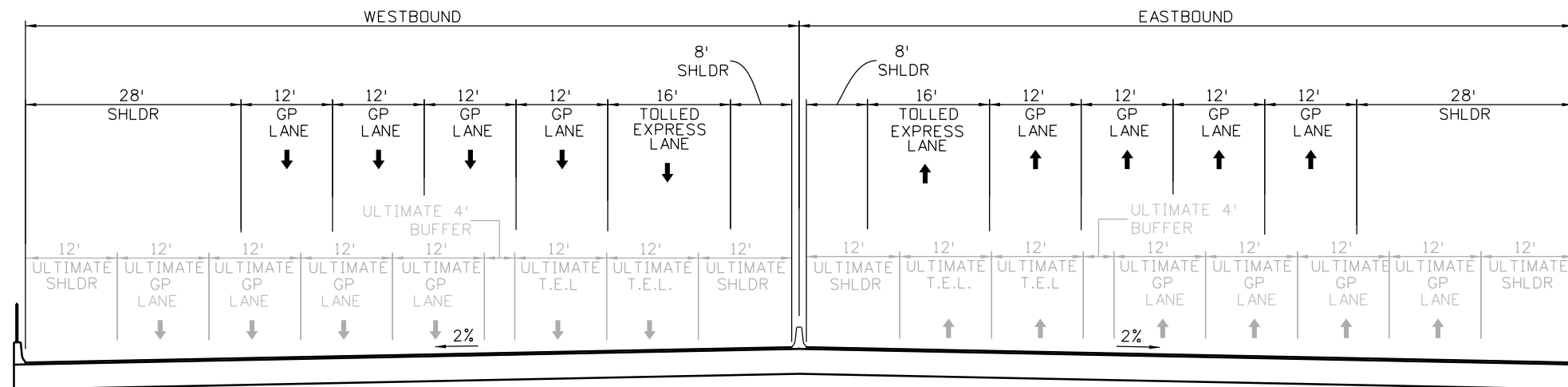
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Designer:	Structure Numbers		
Detailer:			
Sheet Subset: Rdwy Typ	Subset Sheets: 16 of 17		

<b>Project No./Code</b>
FBR 0704-234
19631
Sheet Number <b>16</b>

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**I-270 EB CONNECTOR OVER I-70 MAINLINE**  
(STR. NO. E-17-AFS)



**I-70 MAINLINE OVER PEORIA STREET**  
(STR. NO. E-17-AFT WB, E-17-AFU EB)

Print Date: 6/7/2016	
File Name: 13599BRDG_TypSec01.dgn	
Horiz. Scale: NTS	Vert. Scale: NTS
Unit Information	Unit Leader Initials
<b>ATKINS</b>	7604 Technology Way, Suite 400 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



2000 South Holly Street  
Denver, CO 80222  
Phone: 303-757-9934 FAX: 303-757-9907

Region 1 KJS

<b>PRELIMINARY</b>
No Revisions:
Revised:
Void:

STRUCTURE TYPICAL SECTIONS		
Designer:	Structure Numbers	
Detailer:		
Sheet Subset: 10B Struct	Subset Sheets: 12 of 12	

<b>Project No./Code</b>
FBR 0704-234
19631
Sheet Number





DATE: August 31, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 30.1

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 30.1 has been reviewed by the Procuring Authorities.

Detailed ATC 30.1 proposes modify the MSE wall structure details shown on CDOT's Structural Worksheets to optimize the scope of the Project while providing equal or better solutions.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. The proposed deletion of the geomembrane at the top of the reinforced fill is not approved.
- 2. The proposed replacement of the prescriptive requirements for geocomposite strip drains, piped underdrain, and piped outlets is not approved.
- 3. The proposed boundary modification between the select backfill and common embankment fill that is defined by a 1:1 slope, 1.5 ft. behind the reinforced zone to a vertical boundary line 1.5 ft. behind the reinforced zone is approved with the condition that MSE walls shall be designed using existing soil earth pressure and global stability shall be performed using the new boundary line.
- 4. The proposed update from AASHTO 1996 Standard Bridge Specifications, 16<sup>th</sup> edition (without interims) to AASHTO 2014 LRFD Bridge Specifications 7<sup>th</sup> edition with 2015, 2016 interims is already permitted under the terms of the RFP.



The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

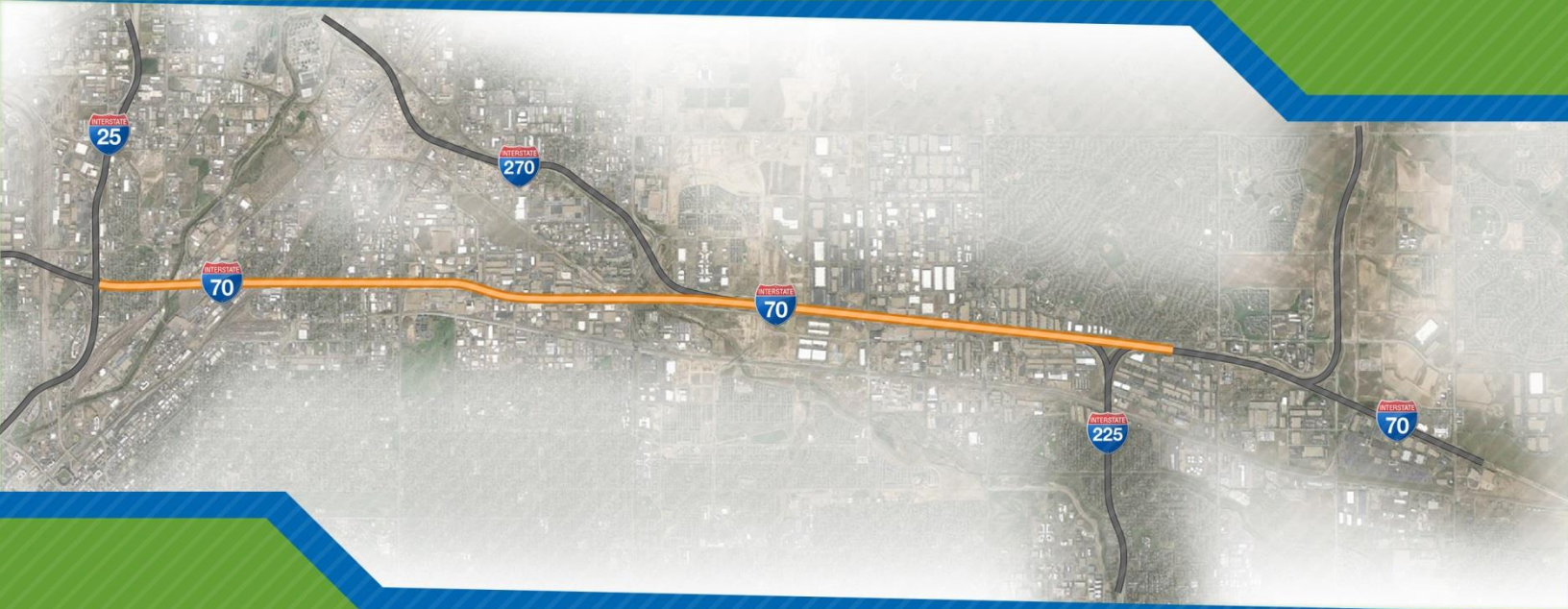




# Central 70 Project

Alternative Technical Concept Submission

ATC 30.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 30.1**

**MSE Wall Structure Worksheet Modification**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Resubmitted to address comments in the response to ATC No. 30.0

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

Kiewit-Meridiam Partners (KMP) has reviewed the Project requirements from a FHWA supported Performance-Based Practical Design (Practical Design) perspective to identify potential cost saving solutions that align with the Project Goals. An application of Practical Design has been identified in regards to the mechanically stabilized earth (MSE) wall structure details. KMP is proposing modifications to MSE wall structure details shown on CDOT's Structural Worksheets to optimize the scope of the Project while providing equal or better solutions. The modifications will customize the standard details to the conditions found on the Project as opposed to the standard detail applicable to a generic starting condition for a typical design. The proposed modifications are based on designs which have been effectively implemented by DOTs throughout the county.

### ATC 30.1 Benefits

- ✓ Practical Design Solution
- ✓ Optimizes Scope
- ✓ Equal or better performance and reliability
- ✓ Decreases Project cost by approximately \$1.5 Mil
- ✓ Decreases construction traffic and Project Emissions
- ✓ Optimizes re-use of On-site Material



## 2. Relevant RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC will require modifications to the following provisions of the Project Agreement (PA).

- CDOT Standard Special Provision - Revision of Section 504
- 10A.10.13.29 FHWA NHI-00-043 Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines (ASD Design)
- 10A.10.13.20 CDOT Bridge Design Manual

Specifically, Schedule 10A of the PA includes “CDOT Structural Worksheets” as Applicable Standards and Specifications. KMP is proposing four modifications to the B-504 worksheet series in the CDOT Structural Worksheets which are further discussed in the Rationale section.

## 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC presents modifications to CDOT’s B-504 Structural Worksheets which reflect the FHWA supported Practical Design initiative. The proposed modifications will be applicable to all MSE walls on the Project and are based on successful designs used by other DOTs throughout the country. The changes will decrease cost while maintaining equivalent levels of MSE wall stability. As discussed in the Relevant RFP Requirements section, four modifications to CDOT’s B-504 Worksheet series are being proposed. Rationale for each modification is included below.

### 1. *Deletion of the requirement for geomembrane at top of reinforced fill*

The intended function of the geomembrane is to protect metallic reinforcements from salt water and reduce backfill piping through panel facing joints. This same function can be provided by alternate means, including durable soil reinforcement components and filtering properties of geotextile material used at facing panel joints.

Installing geomembrane under pavement can heighten risk of early pavement failure due to water ponding in localized sags in the geomembrane. Additionally, constructability of the geomembrane is difficult due to its susceptibility to punctures and tears. KMP’s design avoids these risks, by using design details which encourage free drainage of any minor amounts of infiltrated water.

### 2. *Replace prescriptive requirements for geocomposite strip drains, piped underdrain, and piped outlets with a drainage system designed to allow infiltration and groundwater flow*

By designing for anticipated flow conditions, the drainage details can be optimized through good engineering practices and not be required to rely on a one-size fits all system which may be inefficient for the proposed application. Infiltration rates through the pavement structure and leakage from storm drain features and other pipes will be included in the design for the elevated section of I-70. MSE soil reinforcement design will account for the potentially elevated moisture contents. Backfill material will be tested in direct shear with an elevated moisture content to develop appropriate design parameters.

3. *Modify the boundary between the select backfill and common embankment fill that is defined by a 1:1 slope, 1.5 ft. behind the reinforced zone to a vertical boundary line 1.5 ft. behind the reinforced zone*

Modifying the boundary between select fill and common embankment fill to a vertical boundary line will result in a reduction in structural backfill quantities with negligible effects to the performance of the MSE wall. Changing the orientation of the boundary between reinforced zone backfill and retained zone backfill requires adjustment of the anticipated external lateral earth pressure loading on the MSE wall from the retained zone fill and will likely result in a slight increase to the soil reinforcement length. The resulting section is more constructible as the sloped backfill will no longer potentially conflict with travel lanes.

4. *Update the design reference from AASHTO 1996 Standard Bridge Specifications, 16th edition (without interims) to AASHTO 2014 LRFD Bridge Specifications 7th edition with 2015, 2016 interims*

In the current version of PA, design requirements in Schedule 10 Section 13 for MSE walls are conflicted. Section 13.8.1.c.i specifies that MSE walls shall be designed in accordance with AASHTO LRFD but Schedule 10A specifies both ASD and LRFD design standards.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** By eliminating of the geomembrane beneath the pavement, future repairs to pavement in and around live traffic can be minimized which will limit the risk exposure to the workforce and public.
- **Optimization of Scope:** This ATC optimizes the scope by eliminating generalized requirements and allowing MSE walls to be designed based on actual conditions.
- **Optimization of the Life Cycle Maintenance Costs:** The proposed modifications will enhance the wall life and decrease potential pavement deterioration.
- **Minimize Impacts:** Impacts to the traveling public and local neighborhoods will be reduced through a reduction in localized construction durations.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. All potential impacts will be mitigated through appropriate design considerations.

This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** By decreasing the amount of select soil required for MSE walls, a greater quantity of onsite material will be used. This approach will decrease Project emissions associated with trucking of imported and exported materials.
- **Neighborhood Impacts:** This approach will directly decrease the amount of construction traffic through a reduction in trucking.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC will reduce Project cost through more efficient construction operations and minimized replacement of pavement. **Total cost savings is anticipated to be approximately \$1,500,000.**

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC is not anticipated to impact the overall Project schedule. However, localized construction durations will potentially be reduced.

## 7. Conceptual Drawings

This information ***has been*** amended since the submission of the previous version of this ATC to include additional attachments.

**Attachment A:** Proposed Wall Detail and modifications to CDOT B-504 MSE Wall Detail.

**Attachment B:** Seepage Analysis

**Attachment C:** Approximate locations of proposed MSE Wall modifications

**Attachment D:** Tracked changes of Schedule 10 Section 13.9.1.c of the PA

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC utilizes standards used by other DOTs throughout the country. Specifically, this typical standard is used by Florida and Texas DOTs. Additionally, the CDOT B-504 MSE Wall has been modified locally in Colorado on multiple projects such as TREX.

## 9. Additional Information

This information ***has been*** amended since the submission of the previous version of this ATC to include responses to the Procuring Authorities comments to ATC No. 30.0.

### **ATC 30.0 Comment #1**

*Provide additional details on how drainage is dealt with in the proposed ATC.*

**KMP Response:** Additional details are provided for the weephole drain (**Attachment A**) along with an example seepage analyses (**Attachment B**) demonstrating how the estimated flow from an extreme infiltration event and the resulting pore water pressure distribution may be incorporated into MSE wall design.

### **ATC 30.0 Comment #2**

*Provide site specific examples of Project specific details being proposed.*

**KMP Response:** Locations on the Project where the proposed MSE Wall modifications will occur are Brighton Blvd - East Bridge Approach (approximate Station 2005+50 to Station 2008+50) and Colorado Blvd East to End of Project (**Attachment C**).

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

### 4. List of Required Approvals

No change in the approvals is required to implement this ATC.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10 Section 13.9.1.c of the PA

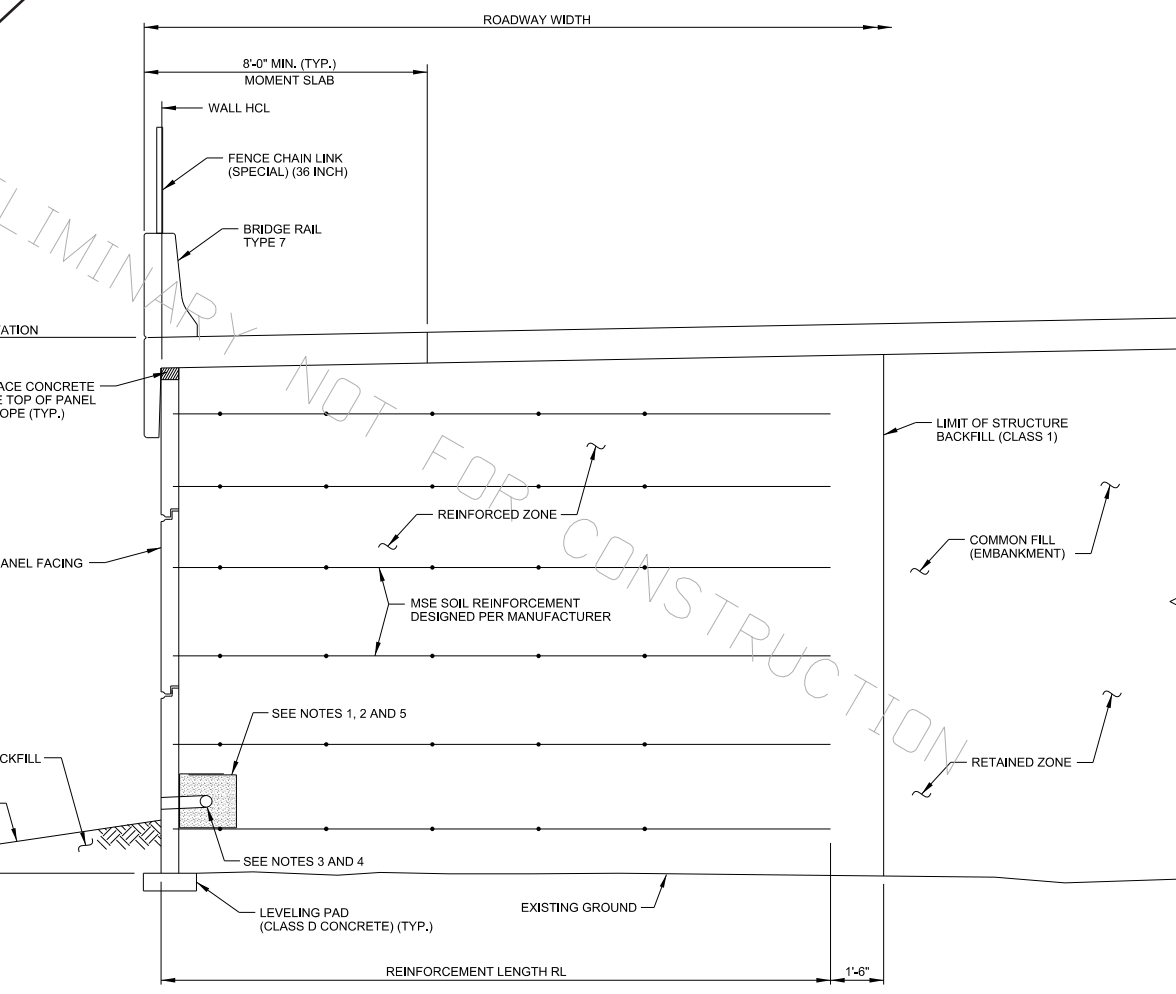
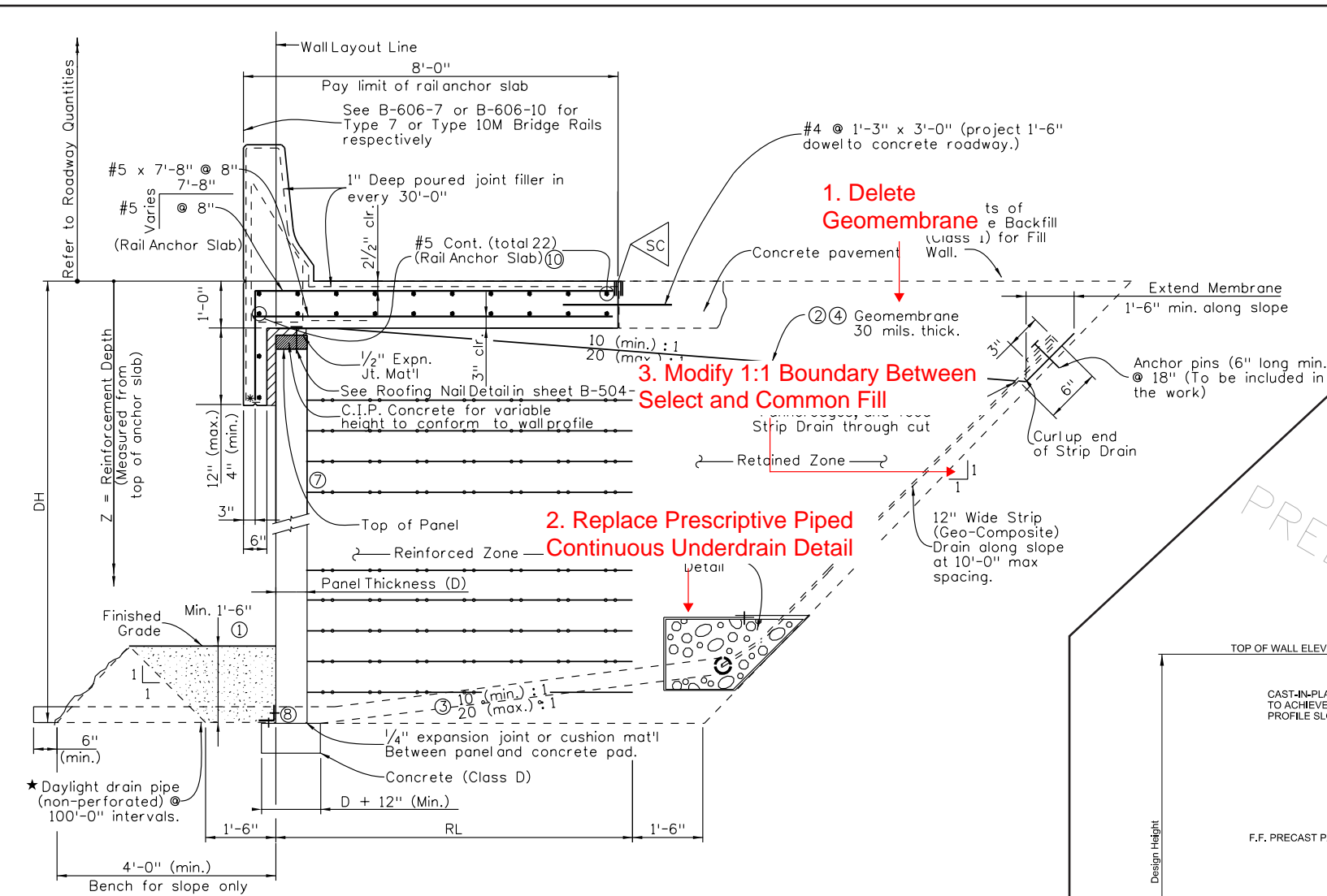
#### b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment D** with tracked changes for the changes in the section listed above.



# ATC No. 30.1 Proposed Detail

- NOTES:**
- 1.5' x 1.5' x 1.5' CLEAN BROKEN STONE OF GRAVEL, SUCH AS CLASS 57 COARSE CONCRETE AGGREGATE OR SIMILAR.
  - PLACE GEOTEXTILE MEETING REQUIREMENTS OF A CLASS 1 DRAINAGE AND SEPARATOR AROUND PERIMETER.
  - INSIDE ENDS OF PIPE SHALL BE COVERED WITH GALVANIZED MESH WITH 1/4" OPENINGS.
  - 3 INCH PVC DRAIN PIPE SLOPE DOWN 1/2" FROM BACK TO FRONT OF WALL AND EXTEND 1/2" BEYOND FRONT FACE OF WALL AND 6" BEYOND BACK OF WALL (INTO FILL).
  - SPACE AT 50' TO 100' CENTERS (SPACING TO BE DETERMINED IN DESIGN BASED ON WALL HEIGHT AND SPECIFIC SITE CONDITIONS).



★ Quantities of perforated pipes (in.), and drain pipes (in.) shall be based on the wall length in the layout plan.

**TYPICAL SECTION**

**DESIGN DATA**

AASHTO Standard Specifications, 16th EDITION

ABP = \_\_\_\_\_ KSF for WALL-X-XX-XX (List each wall)

U = \_\_\_\_\_

4. Update to AASHTO 2014 LRFD Bridge Specifications 7th ed. with 2015, 2016 interims

reinforced and retained zone is assumed to be:  $\phi = 34^\circ$ , Active earth pressure ( $K_a$ ) = 0.2827, At rest earth pressure ( $K_0$ ) = 0.4408.

The 10 Kip vehicular Horizontal Impact Load is applied as per the loading diagram on Dwg. No. B-504-D2. The rail impact load is not included in the calculation of the Bearing Pressure, BP.

Coefficient of resistance to direct sliding = 0.8 (Geogrid)  
= 0.6 (Geotextile) (Used Herein)

See project Special Provisions for the relationship between LTDS and  $T_{ult}$  of Geosynthetic soil reinforcement, and sacrificial thickness of metallic soil reinforcement.

From the Geotechnical report, foundation of wall ABP is checked and deemed to meet or exceed BP. Assume  $\phi_r = \phi$  for sliding.

B-504-D1

CDOT B-504 Standard Detail

TYPICAL SECTION - CONCRETE PANEL FACING MSE WALL



REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	4
B.9	ADDITIONAL INFO	4

ALTERNATIVE TECHNICAL CONCEPT  
**MSE Wall Structure Worksheet Modification**  
 ATTACHMENT A

ATC NUMBER  
**30.1**  
 SHEET NUMBER 1 OF 1

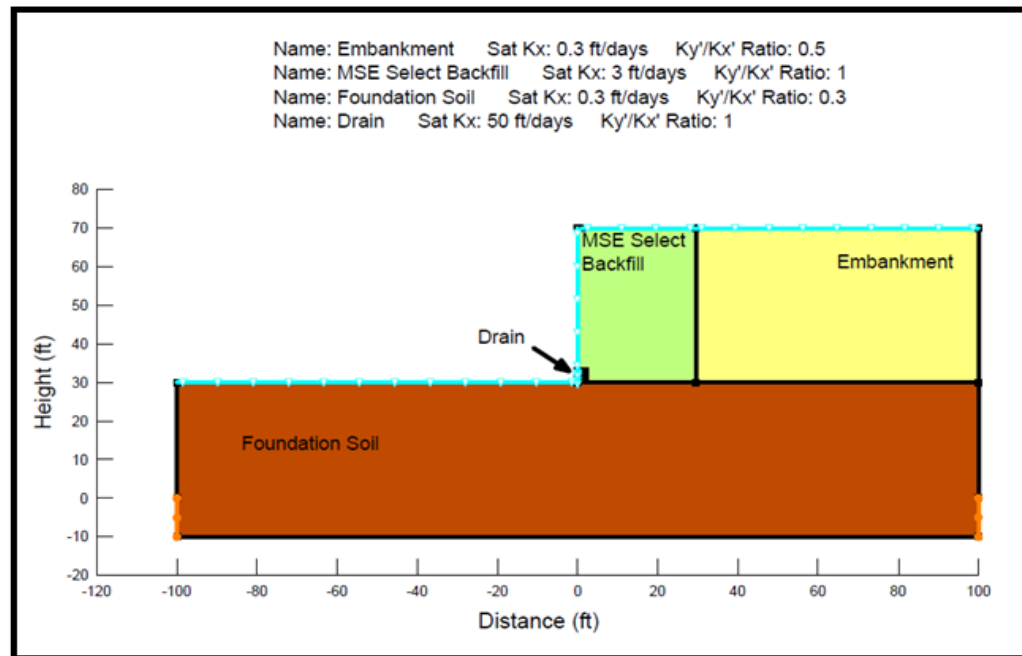


Figure 1. SEEP/w Model Depicting Hydraulic Conductivity of Materials.

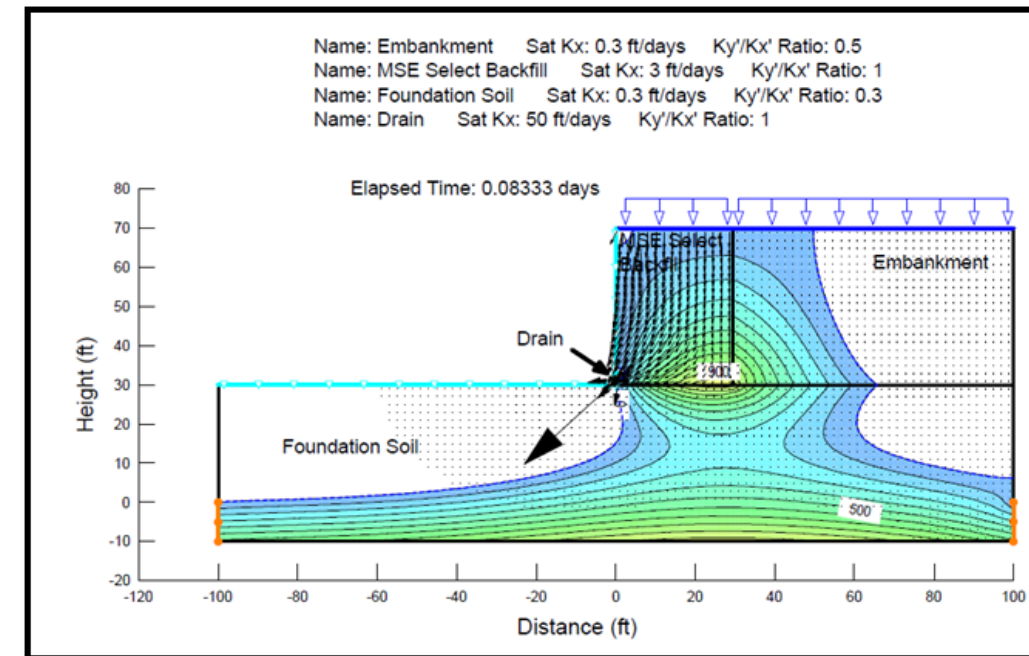


Figure2. SEEP/w Analyses Pore Pressure Contours Transient Flow with 2.0 inches /hour After 2 hours Duration. Groundwater at -10 feet (30 feet below Bottom of Retaining Wall).

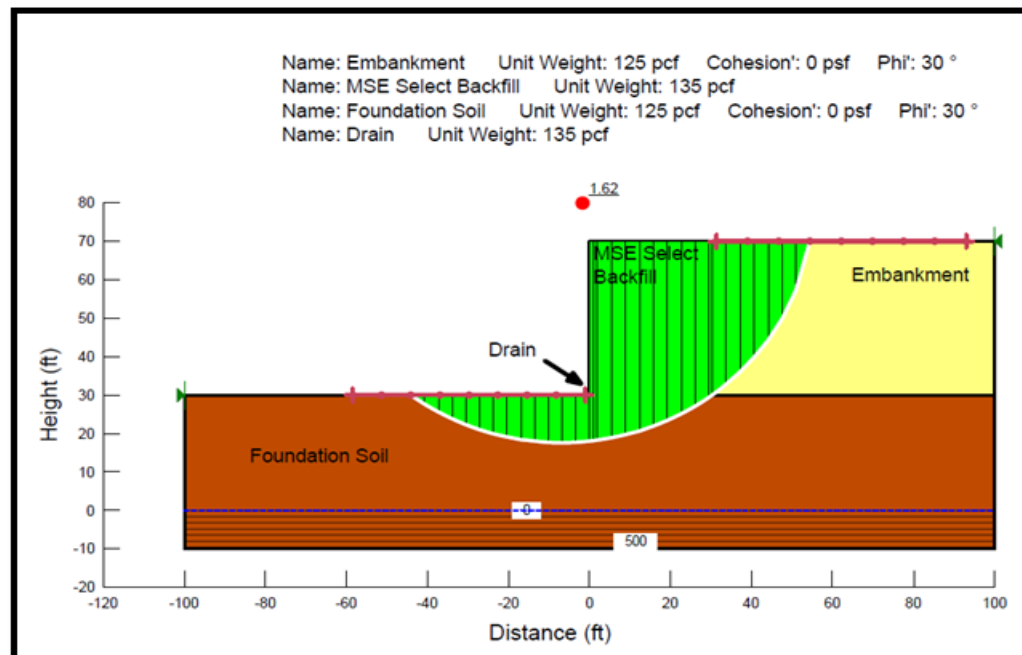


Figure 3. SLOPE/w Analyses Base Line (Dry Condition – No Pore Water Pressure).

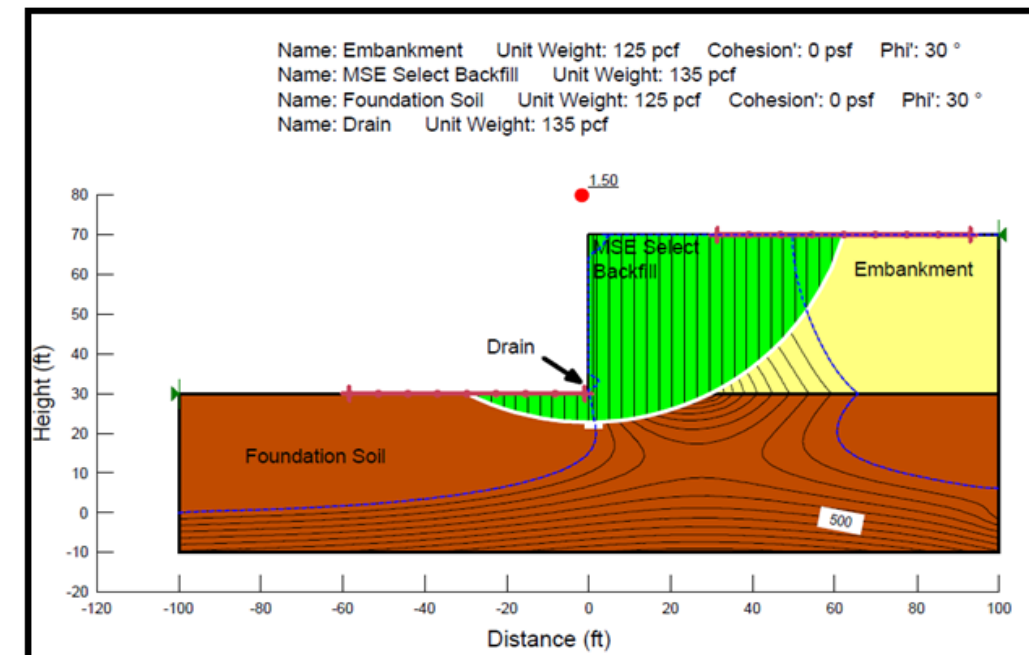
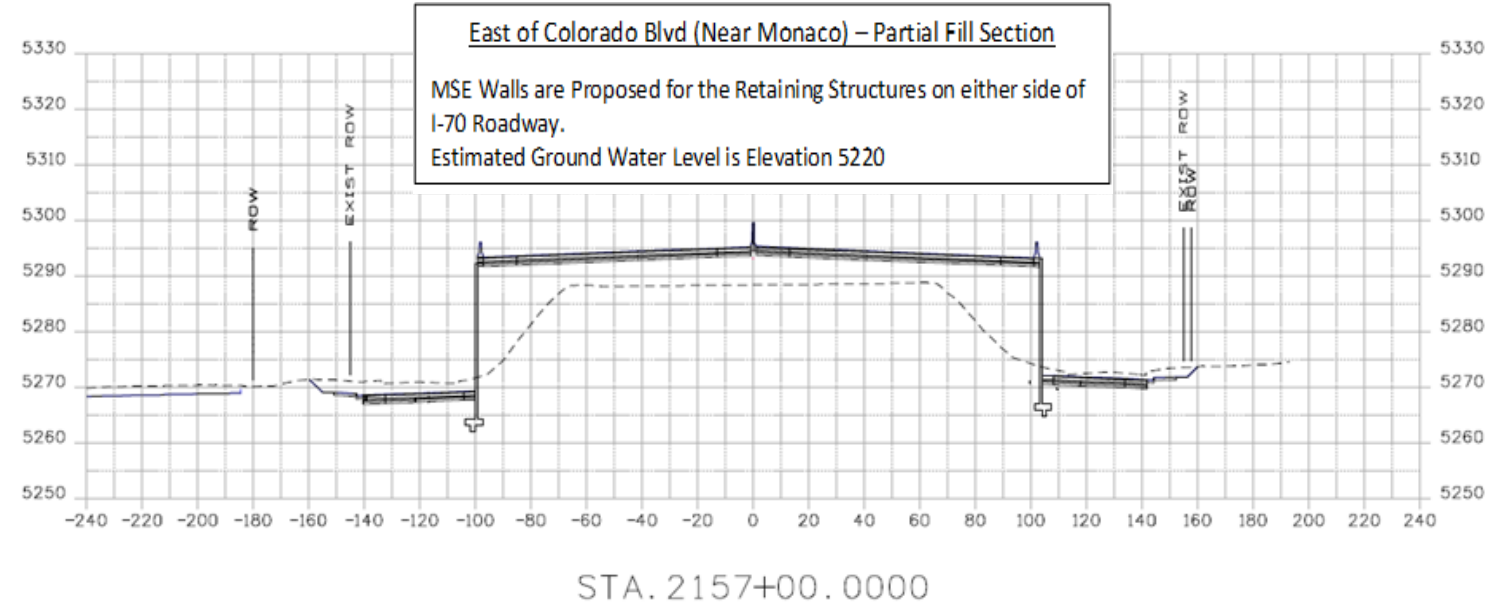
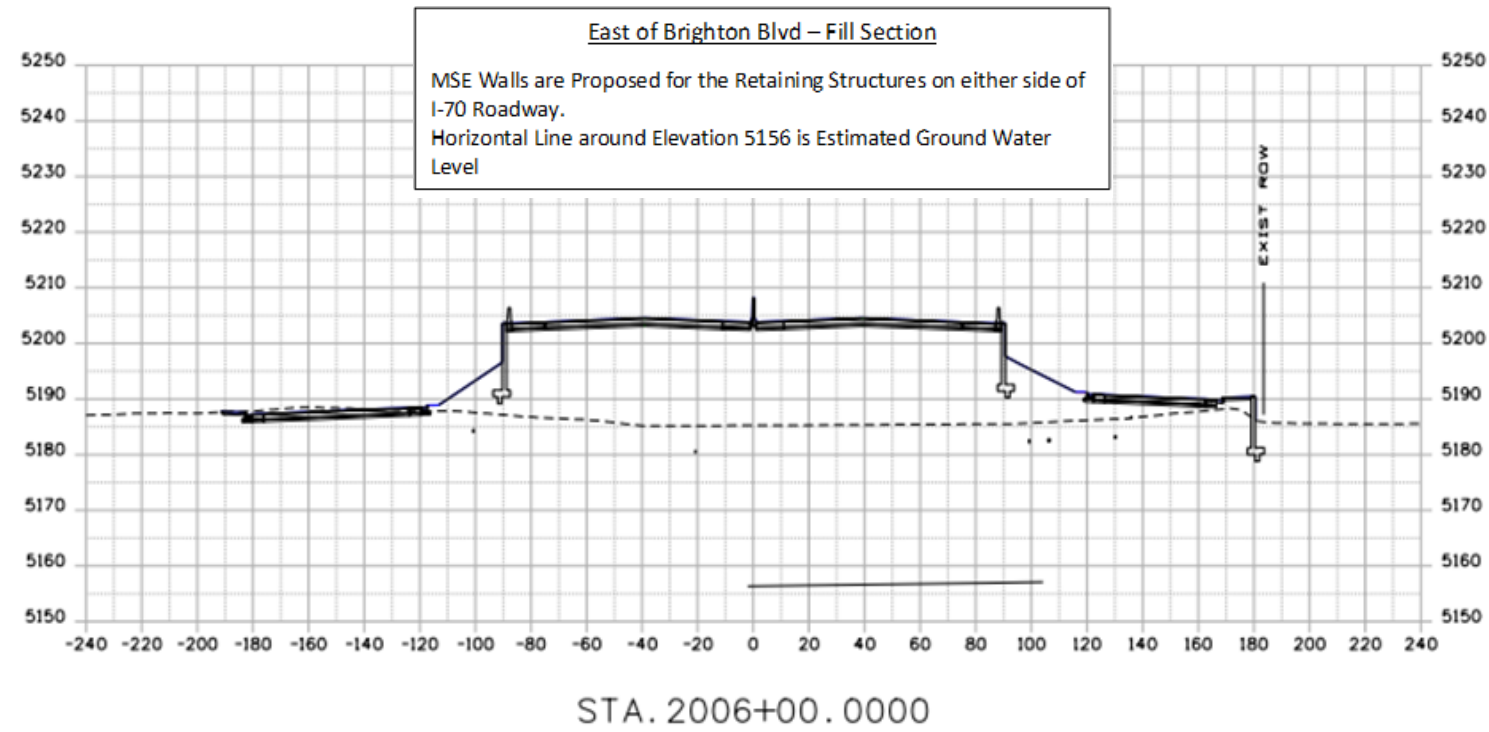


Figure 4. SLOPE/w Analyses Using Pore Pressure Distribution from SEEP/w Analyses At End of 2 Hours (Wet Condition).

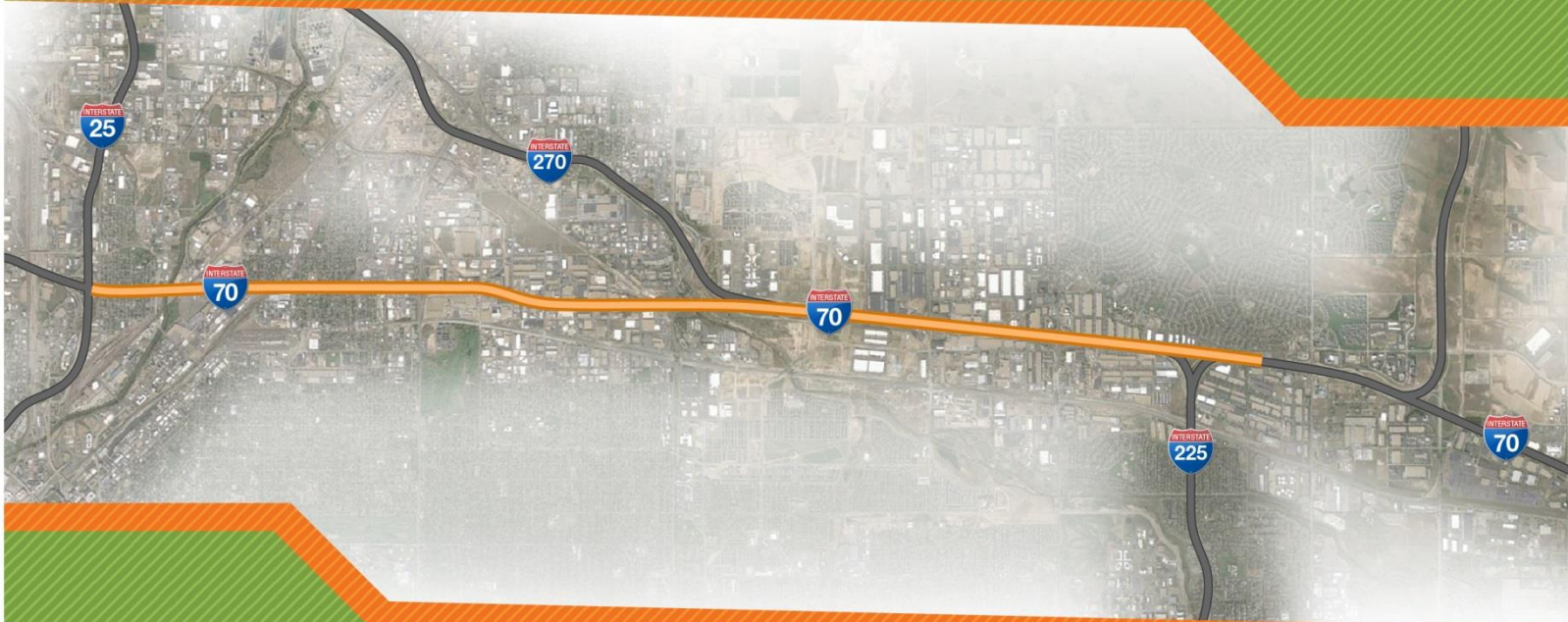




# Central 70 Project

Attachment D – Tracked Changes to Section 13.9.1 of Schedule 10

ATC 30.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016



every wall type. MSE walls shall be designed in accordance with the requirements of AASHTO *LRFD Bridge Design Specifications*. All retaining wall installations shall include a positive drainage system of the backfill. The design of MSE and modular walls near or in bodies of water shall account for soft saturated soils and scour and shall prevent fines washout between facing elements. All walls near irrigation lines for landscaping shall account for any additional hydrostatic load due to a waterline break. All MSE walls with drainage lines placed within the strap zone shall account for any additional hydrostatic load due to pipe leakage. Utilities shall not be placed within the strap zone unless otherwise Approved by the Department. Retaining walls shall be designed according to the seismic criteria from AASHTO *LRFD Bridge Design Specifications*. [Modifications to the CDOT Structure Worksheets B-504 series as shown in Attachment A are acceptable if demonstrated in the MSE wall design submittals.](#)

- ii. Temporary retaining walls may be abandoned and left in place if not in conflict with any permanent elements of the Project and Ultimate design. Temporary retaining walls left in place must be completely covered by soil or construction material, so they are not visible.

d. Characteristics

i. MSE (Panel) Walls

- A. Wall panels shall be constructed of reinforced concrete and provide corrosion protection for prestressing or post-tensioning steel. A mechanical connection to the wall facing shall be provided. Wall panels exposed to splash from traffic shall use epoxy coated reinforcing steel. Panel joints shall accommodate differential settlement.
- B. A barrier shall be provided to prevent fines washout between horizontal and vertical facing panel joints, panel wall construction joints, or relief joints.

ii. MSE (Block) Walls

- A. A mechanical connection to the wall facing shall be provided. Friction connections relying on gravity alone are not permitted unless every course of block is connected to the MSE soil mass with a reinforcing layer. MSE block walls are not acceptable for walls at the bridge locations or for primary retaining walls. The Developer may use MSE block walls for secondary retaining wall locations, such as landscaping. The Developer shall make a list of proposed MSE block wall locations for Approval by the Department.
- B. The Developer shall use the FHWA *Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes - Volumes I and II*.
- C. A barrier shall be provided to prevent fines washout between horizontal and vertical block joints, block wall construction joints, or relief joints.

iii. Cast-in-Place Walls

Cast-in-place walls shall be designed and constructed in accordance with AASHTO *LRFD Bridge Design*. Construction-joint spacing shall accommodate or limit differential settlement. Structural diaphragm walls may be used when top-down construction is warranted.



DATE: September 12, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 31.1

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 31.1 has been reviewed by the Procuring Authorities.

Detailed ATC 31.1 proposes to apply practical design through the use of prudent engineering in the selection of pavement type transitions along the I-70 mainline.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

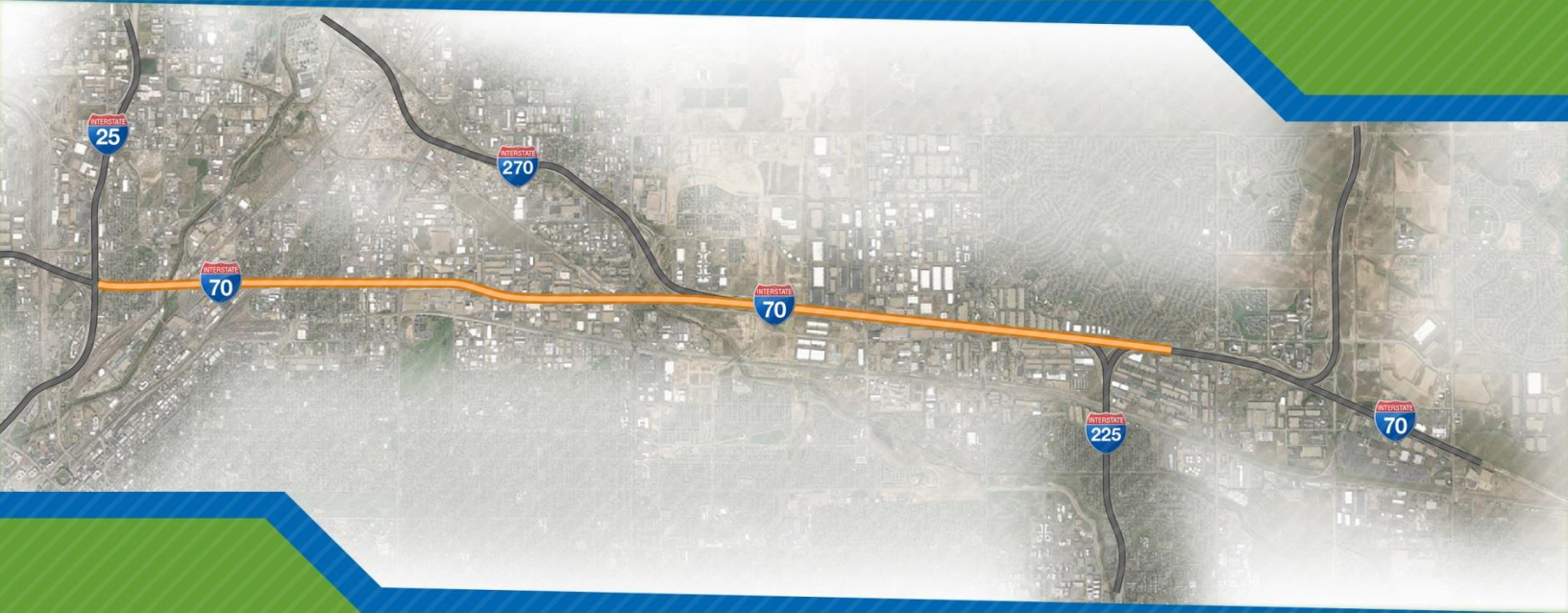




# Central 70 Project

Alternative Technical Concept Submission

ATC 31.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** August 11, 2016

**Central 70 Project RFP: ATC Submission No. 31.1**

**Pavement Type Selection Limits for Best Value**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

Kiewit-Meridiam Partners (KMP) has reviewed the Project requirements from a FHWA supported Performance-Based Practical Design (Practical Design) perspective to identify potential cost saving solutions that align with the Project Goals. KMP is proposing to apply Practical Design through the use of prudent engineering in the selection of pavement type transitions along the I-70 mainline. The flexibility to establish the limits of both hot mix asphalt (HMA) and Portland cement concrete pavement (PCCP) will allow KMP to develop a design that produces the lowest life cycle cost.

To provide the Department with the best value, selection of transitions will be based on a thorough evaluation of the pavement alternatives, and will consider all available information including existing pavement condition, drainage, and geotechnical data. Traffic projections will also be an important factor in optimizing pavement type limits.

### ATC 31.1 Benefits

- ✓ Provides greater design flexibility
- ✓ Practical design solution
- ✓ Equal or better performance
- ✓ Reduces construction cost
- ✓ Reduces life cycle cost
- ✓ Potential total cost savings of \$2 million



## 2. Relevent RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC proposes to revise Schedule 10 Section 6.3.4 of the Project Agreement to allow KMP the flexibility to select the most appropriate pavement type at locations along the Project.

Currently, Schedule 10 Section 6.3.4 of the Project Agreement states that “*the selected pavement type shall be the same for the entire segment between Brighton Boulevard and Sand Creek; and the selected pavement type shall be the same for the entire segment between Sand Creek and I-225.*”

## 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC.

Pavement performance can be better optimized if selection of pavement type is based on a rational, prudent engineering analysis. This decision should include numerous factors, among which are prevailing subgrade/support conditions and traffic at any given location. KMP acknowledges that, while this ATC proposes additional flexibility in evaluating pavement type limits, the number of transitions should be kept to a minimum as a practical consideration during both the construction and O&M term.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** This ATC could potentially reduce material quantities through the optimization of the pavement selection. Decreasing material quantities will result in a direct reduction in construction traffic producing a safer environment for the traveling public.
- **Optimization of Scope:** Allowing KMP the flexibility to evaluate the pavement type limits, based on pavement evaluation and analysis, will potentially reduce the initial construction costs for the Project.
- **Optimization of the Life Cycle Maintenance Costs:** Future maintenance cost may also be reduced based on the expected performance improvements resulting from the proposed optimization.
- **Minimize Impacts to the Traveling Public:** By allowing KMP to select the optimum pavement types for given locations, greater flexibility can be achieved in the selection of detour locations which will provide better traffic flow during construction. Additionally, impacts to the traveling public during the O&M period can be minimized through a reduction in frequency and duration of maintenance activities.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts.

This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** The additional flexibility to establish pavement type limits may decrease the required materials, which in turn would result in fewer truck hauls and reduced Project emissions.
- **Neighborhood Impacts:** This ATC has the potential to decrease localized construction durations and traffic which would minimize impacts to the local neighborhoods.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC will allow KMP the opportunity to analyze and select the optimum pavement type for a given location. This will potentially produce a reduction in overall life cycle cost for the Project. Initial cost analysis indicates an overall savings that may be as high as \$2 million.

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

KMP's initial schedule analysis indicates that localized construction durations may be decreased. However, no significant reduction to the critical path of the schedule is anticipated.

## 7. Conceptual Drawings

This information ***has been*** amended since the submission of the previous version of this ATC to include the tracked changes to Schedule 10 Section 6 of the PA.

**Attachment A:** Tracked changes to Schedule 10 Section 6.3.4 of the PA

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

Several procurement agencies including Texas DOT, Florida DOT, and various Canadian provinces routinely allow the pavement type selection to be left to the Developer. This is particularly true when there is a long term O&M component to the project. With a long term O&M component, the Developer has a vested interest in providing the optimal pavement type selection. Both the cost and risk associated with pavement performance is largely governed by pavement type selection.

Specific examples of projects that have established a precedent in allowing the Developer flexibility to select the most appropriate pavement type at locations along the project include:

- **SH183 Managed Lanes (Dallas, Texas):** Members of the KMP Team participated as the contractor and the pavement designer for this \$850 million project.
- **I-4 Ultimate Project (Orlando, Florida):** Members of the KMP Team participated as the lead designer and pavement designer for this \$2.3 billion project.
- **IH-35E (Dallas, Texas):** This \$1.2 billion project allowed the developer flexibility to select appropriate pavement types at locations along the project. A member of the KMP team participated as the pavement designer for this project.

## 9. Additional Information

This information *has been* amended since the submission of the previous version of this ATC to address the Procuring Authorities' comments in response to Conceptual ATC No. 31.0.

### **ATC 31.0 Comment #1**

*Provide details on minimum length of pavement sections being proposed.*

**KMP Response:** KMP proposes a minimum length of pavement section of approximately 1000 ft. The proposed 1000 ft. minimum length is due to special localized conditions on the Project such as beneath the Cover where a specific pavement type may be desirable based on MEP and/or FLS considerations, or areas such as at the low-point where the pavement structure is in close proximity to the groundwater. Minimum length of pavement sections, if required, outside of these areas, will be maximized to be well beyond the 1000 ft. minimum.

Selection of pavement beneath the Cover will have a significant influence within fire mitigation design. HMA and PCC pavements create different considerations during the design of the fire protection system. Additionally, O&M considerations for both routine maintenance and renewal activities need to be considered due to limited headroom availability. Certain pavement renewal operations will be impacted by this limited space and will require special considerations for pavement rehabilitation. Pavement repairs required following a fire event will have similar challenges. KMP proposes to optimize the pavement design under the Cover regardless of the pavement selection outside its limits. This optimization will consider all factors including capital cost, fire mitigation design, and O&M renewal and routine operations.

KMP is also proposing the flexibility to evaluate the pavement selection at the low-point of the Lowered Section near the UPRR Grade Separation Structure. This will allow KMP to independently select a pavement type that is best suited to address groundwater fluctuations. KMP has consulted with local hydrogeologists to determine the likelihood for an extreme rise in groundwater elevation which could potentially saturate the subbase of the pavement cross-section. While the probability is low, KMP's prudent engineering judgment is to evaluate a design which considers a saturated subbase condition. In this design consideration, there are advantages and disadvantages associated with both HMA and PCC pavements. KMP's proposal allows the flexibility to consider either pavement type for this condition without consideration of the adjacent pavement type selection outside the limits of groundwater influence.

## C. Detailed ATC Requirements

### 1. Risks

There are no risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with implementation of this ATC.

### 3. Right-of-Way

No additional right-of-way is expected to be required to implement this ATC.

## 4. List of Required Approvals

No new approvals are expected to be required to implement this ATC

## 5. Proposed Drafting Revisions

### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following section be revised for the exclusive use by KMP upon acceptance of this ATC.

- Section 6.3.4 of Schedule 10 of the Project Agreement

### b) Proposed Revisions to address Inconsistencies

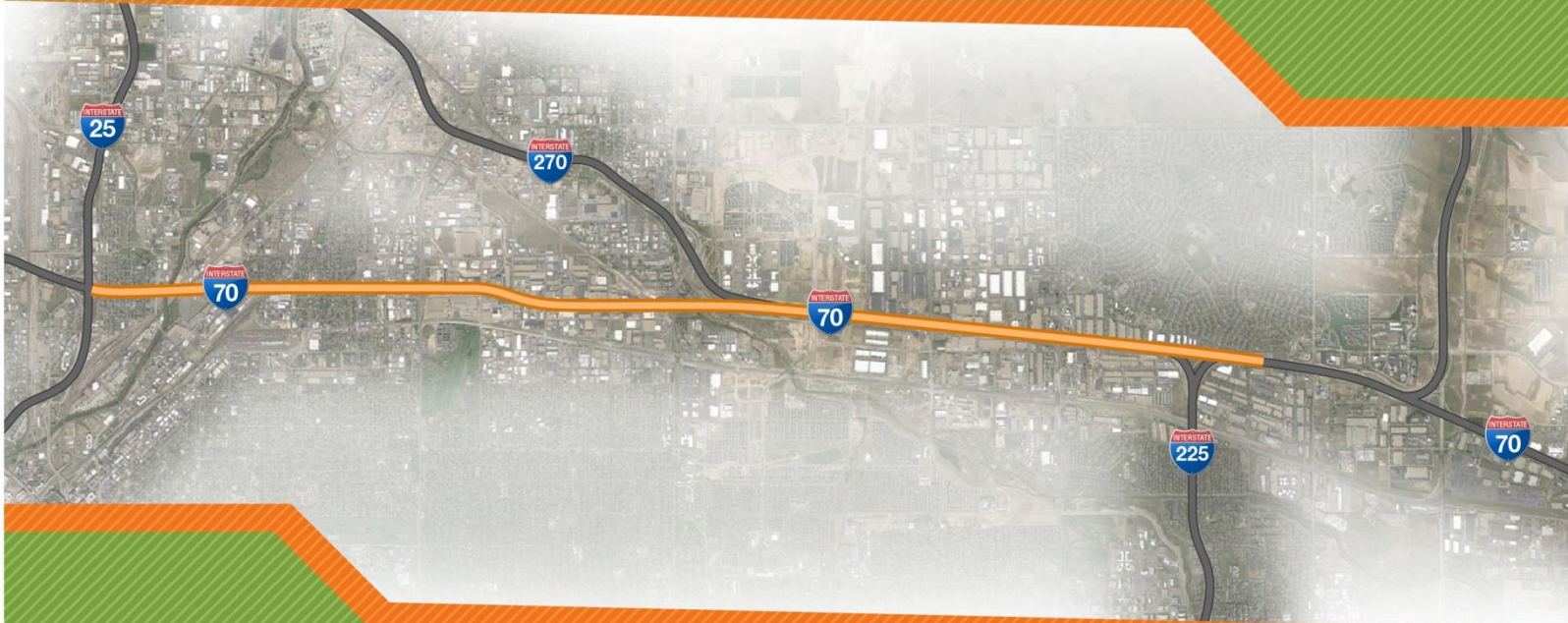
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 6.3.4 of Schedule 10

ATC 31.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

August 11, 2016



## 6. ROADWAY PAVEMENTS

### 6.1 General

- 6.1.1 The Developer shall be responsible for the design and construction of the I-70 Mainline and Local Agency Roadway pavements to meet the requirements and criteria specified in this Section 6.
- 6.1.2 Roadway pavement segments for CDOT Roadways are provided by the Department. The Developer shall be responsible for material mix designs and construction on these roadways to meet the requirements and criteria specified in this Section 6.
- 6.1.3 The pavement type for private roadways, accesses, and driveways shall be the same as the existing facility and comply with Local Agency requirements unless otherwise Approved by the Department.

### 6.2 Applicable Standards

- 6.2.1 All Construction Work required to be performed by the Developer pursuant to this Section 6 shall comply with the Construction Standards, the relevant requirements listed in this Section 6, and Good Industry Practice.
- 6.2.2 The Developer shall design the I-70 Mainline pavements, including a combination of materials and layer thicknesses for the pavement structure, in accordance with the requirements of the CDOT *M-E Pavement Design Manual*. Pavement design thickness shall be determined in accordance with the AASHTO mechanistic-empirical (M-E) design procedure using AASHTOWare *Pavement M-E Design* software (formerly DARWin-ME™).
- 6.2.3 The Developer shall design the Local Agency Roadway pavements, including a combination of materials and layer thicknesses for the pavement structure, in accordance with Local Agency standards.

### 6.3 Design

- 6.3.1 Available traffic data is provided in the Reference Documents. The Developer shall conduct such additional traffic data collections as it determines necessary to complete its pavement designs.
- 6.3.2 The Developer is responsible for integrating the pavement designs with the design and construction of effective subsurface drainage and frost protection, including the provision of subdrains or any other drainage treatments.
- 6.3.3 The asphalt binder required for I70 Mainline pavements shall be determined using LTPPB using location-specific climate data assuming 98% reliability and slow conditions.
- 6.3.4 The I-70 Mainline pavement type may be either hot mix asphalt (HMA) or Portland cement concrete pavement (PCCP), provided that the selected pavement type shall be the same for a minimum of 1,000-feet for the entire segment between Brighton Boulevard and Sand Creek; and the selected pavement type shall be the same for the entire segment between Sand Creek and I-225. The pavement structure shall be the same from edge of pavement to edge of pavement, for both segments.

### 6.4 Pavement Design Reports and Pavement Designs

- 6.4.1 The Developer shall prepare and separate Pavement Design Reports for:
  - a. I-70 Mainline (to be submitted to the Department for Information); and
  - b. Local Agency Roadways pavement designs (to be submitted to the Local Agency for approval and the Department for Information).
- 6.4.2 As part of the Developer's Pavement Design Report submittals include the following:
  - a. The proposed typical pavement sections;
  - b. Geotechnical data and geotechnical design assumptions;
  - c. Material property assumptions;



DATE: August 4, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 33.1

Dear Mr. John Dionisio:

Your Team's ATC Submission Form for Detailed ATC 33.1 has been reviewed by the Procuring Authorities.

Detailed ATC 33.1 proposes that all available techniques be considered for the remediation of the existing pavement, including localized repairs, diamond grinding, and overlay on a lane-by-lane basis between Sand Creek and Chambers Road.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



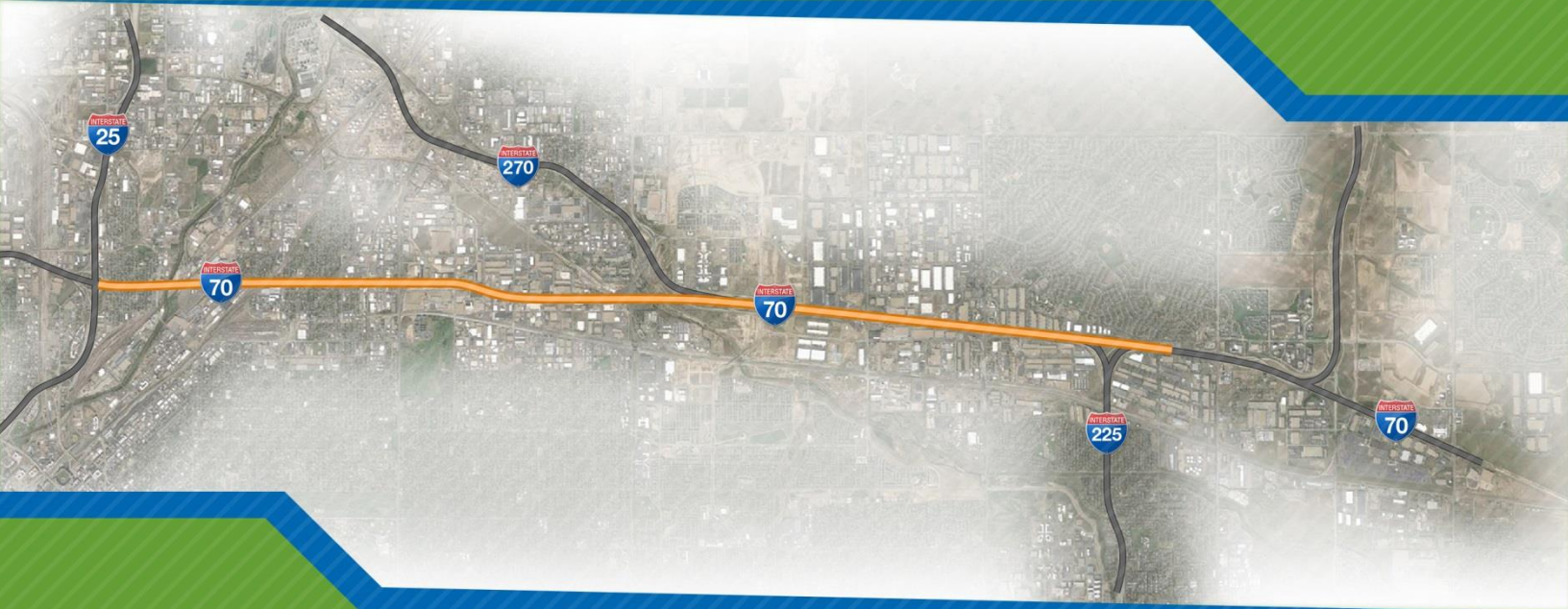




# Central 70 Project

Alternative Technical Concept Submission

ATC 33.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 33.1**

**Optimized Pavement Remediation between Sand Creek and Chambers Road**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

This information *has not been* amended since the submission of the previous version of this ATC.

Kiewit-Meridiam Partners (KMP) proposes that all available techniques be considered for the remediation of the existing pavement, including localized repairs, diamond grinding, and overlay on a lane-by-lane basis between Sand Creek and Chambers Rd. The existing pavement between Sand Creek and Chambers Rd. varies from areas in exceptional condition to other areas requiring remediation. The intent of this ATC is to deliver the best value for the Project by selecting the optimum remediation based on the specific distress that requires correction. An overlay may not always be the best option for some types of distress, this ATC proposes additional techniques to address pavement that is not in conformance with the O&M Targets for pavement performance.

### ATC 33.1 Benefits

- ✓ Provides equal or better performance and reliability
- ✓ Utilizes common pavement remediation techniques
- ✓ Optimizes construction and life cycle maintenance costs
- ✓ Minimizes impacts to travelling public

## 2. Relevent RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

Section 6.6.7 of Schedule 10 of the Project Agreement (PA) requires that:

*In order to facilitate the addition of a Tolled Express Lane in each direction on the existing I-70 Mainline between Sand Creek and Chambers Road, the Developer shall meet the applicable General Requirements and meet or exceed the applicable Targets, as described in Schedule 11 Operations and Maintenance Requirements. In the event that the existing pavement does not meet such requirements, **the Developer shall overlay the existing pavement to provide a safe and even surface across the entire width of the pavement.** The overlay requirement shall not apply to the existing concrete pavement that begins approximately west of I-225.*

It is proposed that the text in bold be modified to read: *In the event that the existing pavement does not meet such requirements, the Developer shall **remediate the existing pavement to provide a safe and even surface across the entire width of the pavement. For localized repairs, remediation shall be full lane width and joints shall match new lane lines.***

## 3. Rationale

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC will allow KMP the option of using localized repairs, diamond grinding, and/or pavement overlay based on a lane-by-lane analysis of the roadway. The localized imperfections can be repaired more cost effectively by localized repairs rather than a full width pavement overlay as required by the PA.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** Efficient application of alternate remediation strategies will limit the exposure to workforce and traveling public to more extensive and intrusive construction operations.
- **Optimization of Scope:** This ATC will achieve the same performance as a full overlay at a reduced cost, providing the Department an optimized scope.
- **Optimization of the Life Cycle Maintenance Costs:** Localized intervention and remedial options will be incorporated into the long term pavement management strategy. This will decrease the life cycle costs.
- **Minimize Impacts:** The alternative pavement remediation techniques suggested in this ATC will reduce the duration of traffic disruptions compared to durations associated with an overlay. For example, many of these localized imperfection corrections can be completed in a single night with a lane closure.
- **Ensures Reliable Travel Speeds:** During construction, the number and length of the lane closures required for localized repairs will be reduced and will therefore provide more reliable travel speeds for the public.
- **Enhances Community Value:** Alternative remediation strategies will reduce the amount of asphalt that will be needed to construct the roadway. This in turn will reduce truck traffic to and from the Project site. Reducing the number of trucks traveling throughout the corridor will improve localized congestion.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. By allowing KMP to select the most appropriate remediation, the pavement performance will be improved. This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** This ATC will result in decreased asphalt quantities which will reduce trucking required to transport materials to and from the asphalt hot plant. This reduction in trucking will minimize Project emissions.
- **Neighborhood Impacts:** Decreasing localized construction durations and traffic will minimize impacts to the local neighborhoods.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

The ability to use localized intervention and remedial options for pavement repair will reduce both construction and O&M costs. KMP is currently analyzing the potential cost benefits. Preliminary analysis indicates a cost savings to the Project, but quantification will be realized as these alternative methods are developed for the various locations.

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

The improvements to the existing pavement from Sand Creek to Chambers Rd. area are not on the critical path for Project, however accelerating this work will potentially help to achieve an earlier completion for this segment. KMP is still analyzing the potential schedule benefits but anticipates a schedule savings between one to two months.

## 7. Conceptual Drawings

This information ***has been*** amended since the submission of the previous version of this ATC to include the tracked changes to Schedule 10 Section 6 of the PA.

**Attachment A:** Tracked changes to Schedule 10 Section 6.6.7 of the PA

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

Tailored intervention to address specific performance requirements is a common practice among owner-agencies including CDOT. For some areas of the pavement between Sand Creek and Chambers Rd., the pavement is experiencing only localized failures and other distresses that are best remedied using techniques that are commonly available and effective including full-depth patching and diamond grinding

## 9. Additional Information

This information *has been* amended since the submission of the previous version of this ATC to address the Procuring Authorities' comments in response to Conceptual ATC No. 33.0.

## **ATC 33.0 Comment #1**

*Provide details on how the remediated pavement joint lines would line up with the newly striped roadway.*

**KMP Response:** KMP proposes that all remediation conducted as part of this ATC adhere to industry best practices, such as those published by the Asphalt Institute in MS-16, "Asphalt in Pavement Preservation and Maintenance". Adherence includes a commitment that joint lines for all patching will have neat, squared, sawed edges that line up with the newly striped roadway.

## **C. Detailed ATC Requirements**

### **1. Risks**

There are no risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### **2. Handback**

There are no changes in handback procedures and/or the Handback Requirements associated with implementation of this ATC.

### **3. Right-of-Way**

No additional right-of-way is expected to be required to implement this ATC.

### **4. List of Required Approvals**

No new approvals are expected to be required to implement this ATC

### **5. Proposed Drafting Revisions**

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following section be revised for the exclusive use by KMP upon acceptance of this ATC.

- Section 6.6.7 of Schedule 10 (Design and Construction Requirements) of the Project Agreement (PA)

#### b) Proposed Revisions to address Inconsistencies

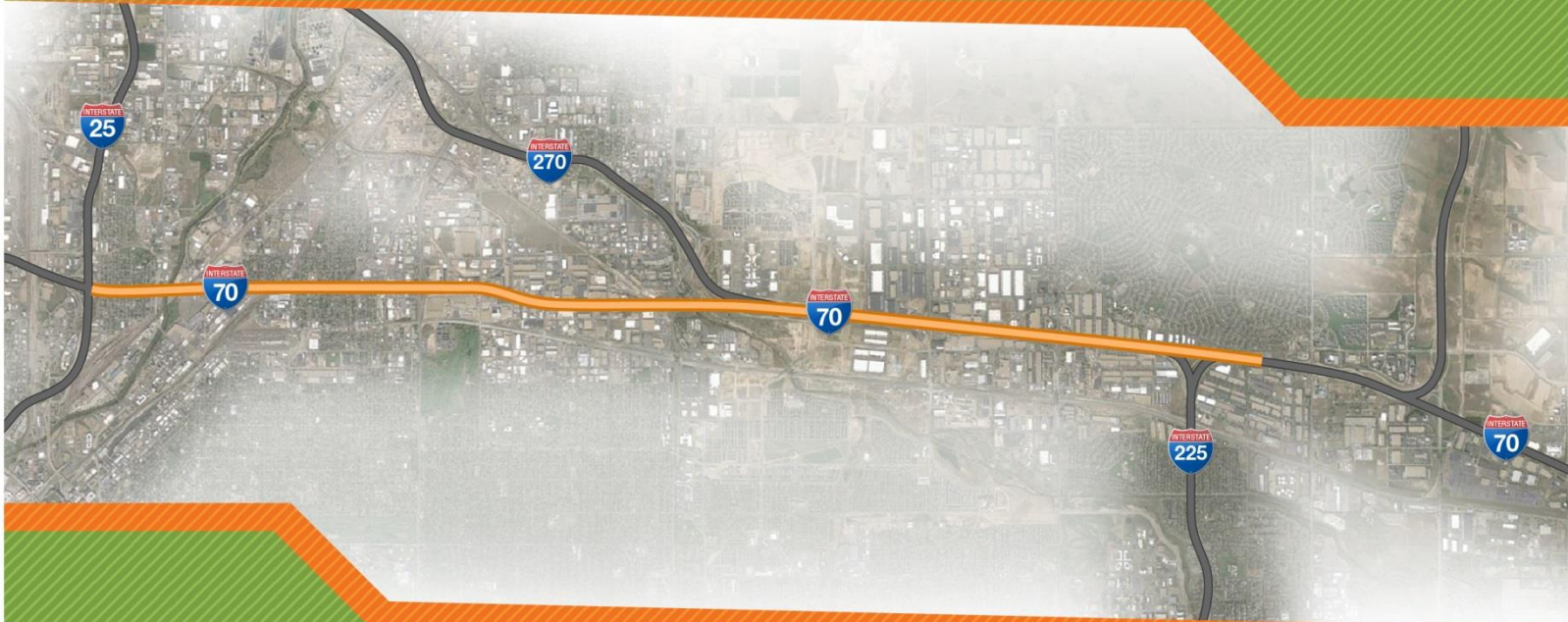
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 6.6.7 of Schedule 10

ATC 33.1



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016



- 6.6.4 A minimum of 14 Calendar Days prior to the proposed use of any pavement in the Construction Work, a pre-paving conference shall be conducted.
- 6.6.5 Submission by the Developer, of pavement mix designs, and Acceptance by the Department, for CDOT Roadways and Local Agency Roadways for SMA, HMA, and PCCP, as well as Jointing Plans for PCCP for any roadway, is a condition for the initiation of any paving Construction Work.
- 6.6.6 Submission by the Developer, for Information, of pavement mix designs for the I-70 Mainline for SMA, HMA, and PCCP, is a condition for the initiation of any paving Construction Work.
- 6.6.7 In order to facilitate the addition of a Tolloed Express Lane in each direction on the existing I-70 Mainline between Sand Creek and Chambers Road, the Developer shall meet the applicable General Requirements and meet or exceed the applicable Targets, as described in Schedule 11 Operations and Maintenance Requirements. In the event that the existing pavement does not meet such requirements, the Developer shall remediate the existing pavement to provide a safe and even surface across the entire width of the pavement. For localized repairs, remediation shall be full lane width and joints shall match new lane lines. ~~overlay the existing pavement to provide a safe and even surface across the entire width of the pavement. The overlay requirement shall not apply to the existing concrete pavement that begins approximately west of I-225.~~ Within the concrete pavement segment the Developer shall evaluate the location of existing joint lines in the widening and restriping plan to ensure compliance with CDOT Standard Plan M-412-1.
- 6.6.8 The Developer shall provide a hard capped surface adjacent to the I-70 Mainline shoulders from East of Sand Creek Bridge to I-225. The Developer shall determine the type and thickness of material that shall be used to accommodate the safe emergency storage of disabled vehicles. The hard capped surface shall include the following elements:
- a. Smooth matching the grade and cross-slope of adjacent pavement without drop-offs;
  - b. Type that prevents tracking of material onto the roadway surface; and
  - c. Be free of the growth of weeds/grass.
- The Developer shall be responsible for the maintenance of the hard capped surface for the duration of the Term.
- 6.6.9 For I-70 Mainline, if PCCP is selected, PCCP shall extend to the limit of the physical gore on all ramps.
- 6.6.10 Roadway Pavement Materials
- a. HMA mixes shall be subject to voids acceptance.
    - i. SMA acceptance shall be based on gradation.
  - b. If PCCP is selected, the following shall apply:
    - i. PCCP shall meet or exceed the minimum compressive or flexural strength requirements in accordance with the CDOT Standard Specifications;
    - ii. Joint design shall include tied inside and outside shoulders. Outside mainline shoulders shall include doweled transverse contraction joints;
    - iii. Longitudinal and transverse joint designs shall be compatible with lane and shoulder configurations. Longitudinal joints shall be placed adjacent to lane markings.
    - iv. The Developer shall texture the I-70 Mainline outside shoulders in accordance with the CDOT *Standard Specifications*. Final stamping stationing is not required.

6.6.11 Pavement Smoothness

The pavement surface shall comply with the smoothness requirements set out in Table 6-2 and Appendix A Project



DATE: March 13, 2017  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 37.2

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 37.2 has been reviewed by the Procuring Authorities. Detailed ATC 37.2 proposes to provide a compliant electrical system design that is appropriate for the nature of the urban Cover structure.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).
- 5. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

The ATC is approved with the following conditions:

Conditions of approval:

1. The proposed modifications to remove the reference to IEC 61508 are not acceptable to the Procuring Authorities. The Project control systems shall remain subject to compliance with IEC 61508.
2. The battery autonomy of the UPS systems shall be at least long enough to allow the generator to start and stabilize. Additionally, the design shall consider the time required to safely shut down the tunnel in the event that the generator does not start. If selected as the Preferred Proposer, Developer shall be required to submit information demonstrating compliance with these requirements for Acceptance by the Procuring Authorities.



3. The Developer shall solely be responsible for any Governmental Approvals required to implement this ATC. In particular, approval from the AHJ will be required.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



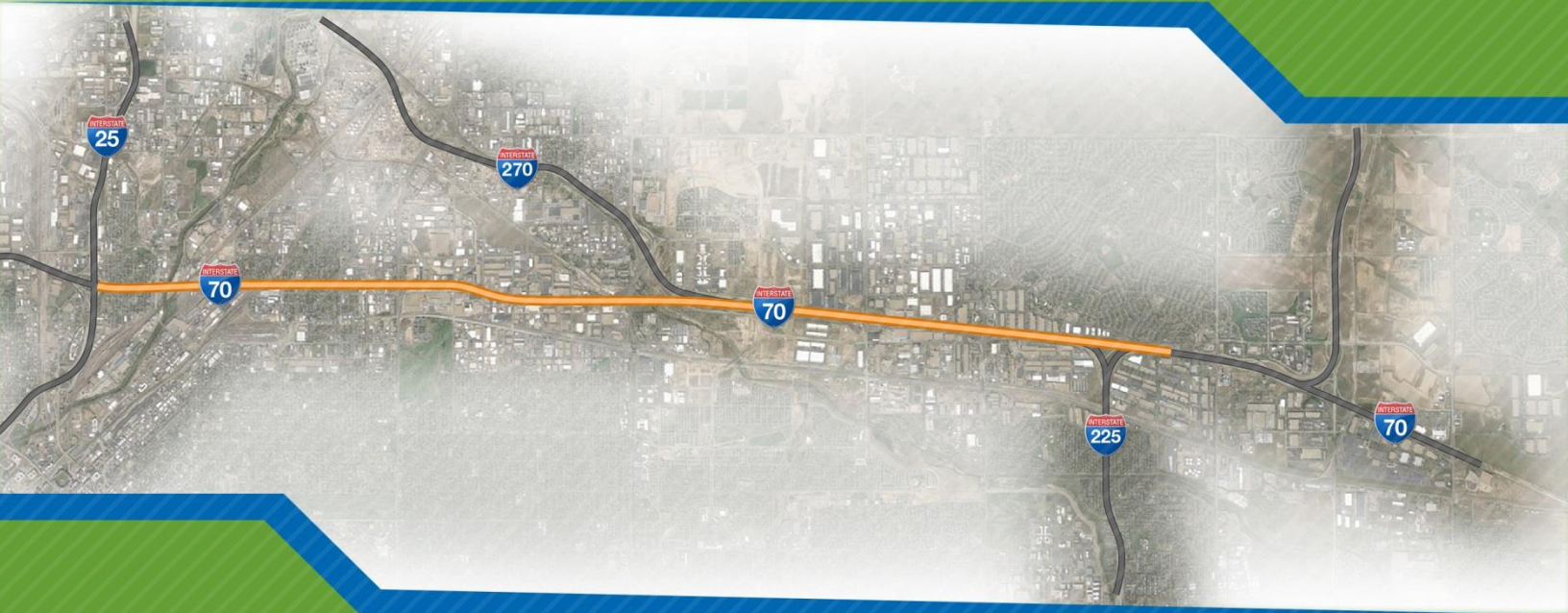




# Central 70 Project

Alternative Technical Concept Submission

ATC 37.2



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** February 22, 2017

**Central 70 Project RFP: ATC Submission No. 37.2**

**Alternate Cover Electrical System Requirements**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

*KMP is resubmitting the Detailed ATC to address the items requested on the conditional approval of Conceptual ATC 37.0, subsequent rejection of previously conditionally approved ATC 37.1 and results of discussions from AHJ meeting on January 25, 2017.*

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### ATC 37.2 Benefits

- ✓ Practical Design
- ✓ Equal or better performance and reliability
- ✓ Optimize the scope
- ✓ Optimize operations and life cycle maintenance costs
- ✓ Reduces community impacts
- ✓ Approximate cost savings of \$2.5 million

### B. General ATC Submission Requirements

#### 1. Overview Description

This information **has been** amended since the submission of the previous version of this ATC. In an effort to provide the Procuring Authorities with an innovative, flexible, and cost effective design solution, Kiewit-Meridiam Partners (KMP) proposes to revise the requirements for the electrical system associated with the Cover. The purpose of this ATC is to provide a compliant electrical system design that is appropriate for the nature of this urban Cover structure.

KMP proposes to provide emergency power through the use of an uninterruptable power supply (UPS) and an on-site, stand-alone generator. UPS will be provided with a single UPS unit to service both tunnel emergency lighting and safety systems with 5-minute battery backup to override a momentary outage during transfer from normal to emergency source. Regarding redundant and/or reliable control, KMP proposes to remove the reference to IEC 61508 because this standard is not used in industry practice in the United States and is not applicable to tunnels.

Through proven engineering practice, KMP will deliver an efficient design for the Cover electrical system while minimizing unnecessary or operationally complex systems that are



included in the Project Agreement (PA). This compliant design will provide significant cost savings for the Project and will result in an electrical system that will ensure reliable functionality and deliver public safety during an emergency event. The single most important consideration in development of this concept is an analysis to ensure the safety of the workforce, public, and first responders responsible for protecting the community in emergency situations.

KMP understands that approval of these design concepts requires collaboration with the Authority Having Jurisdiction (AHJ) and subsequently presented the design concepts directly to the AHJ in an Individual Topic Meeting on January 25, 2017. Feedback from that meeting indicated that the AHJ had no objections or concerns with the revised design concept. Following the presentation, the Procuring Authorities requested the ATC be resubmitted. KMP acknowledges the requirement to further coordinate the design with the AHJ during the final design phase of the Project.

## 2. Relevant RFP Requirements

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC proposes revisions to the requirements in Schedule 10, Section 12.11 (Cover Design Baseline Report), 12.17 (Cover ITS and Communications System) and Section 12.18 (Electrical Systems) of the PA.

## 3. Rationale

This information ***has been*** amended since the submission of the previous version of this ATC.

The purpose of this ATC is to provide a compliant electrical system design that is appropriate for the nature of the Cover structure. The proposed design uses one utility (electrical power) source for normal operations and an on-site, stand-alone, emergency generator in an outdoor enclosure for the emergency source. Power distribution equipment will be located in outdoor enclosures and within separate, dedicated rooms for normal and emergency electrical systems within the concession building, providing a more efficient, streamlined power distribution system, while meeting the requirements of NFPA 502 and NEC Section 700.

This ATC proposes to use a UPS system that serves both tunnel emergency lighting and the safety systems for power. The UPS will have a protection time of 5 minutes to override momentary outage during transfer of the power system from the normal to emergency source. This change from 120 minutes protection time currently required in the PA will provide significant system efficiencies resulting in substantial cost savings to the Project while delivering ample protection time for emergency power systems to engage. Centralizing these types of loads to one UPS system provides for a consolidated approach to the design with a battery plant that is suitable for the anticipated outage that may occur during transfer between the two sources.

NFPA 502 does not have requirements that the control system be subject to IEC 61508, and only indicates that tunnels have redundant facilities for the purpose of control and monitoring. Tunnels in the United States do not follow the IEC 61508 standard. US tunnel applications typically use primary and redundant PLC processor and power supply combination hubs configured in hot standby backup for uninterrupted control and monitoring. Typically, these PLC hubs are in physically separate cabinet locations from each other.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** First and foremost, KMP is committed to protecting the safety of the workforce, public, and first responders. The proposed ATC would not be pursued if it did not provide reliable power to the ventilation and fire life safety systems, which can be proven through good engineering practice.
- **Optimization of Scope:** This ATC will optimize scope through meeting the Project Goals and requirements while reducing construction schedule and cost.
- **Optimization of the Life Cycle Maintenance Costs:** The proposed electrical system will result in reduced long term maintenance costs.
- **Minimize Impacts:** This ATC results in a reduction of the footprint required for the utility vaults. Given the tight right-of-way constraints in the vicinity of the Cover, the reduction in footprint will assist in minimizing impacts to the nearby communities.

## 4. Impacts

This information *has not been* amended since the submission of the previous version of this ATC.

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts.

## 5. Cost and Benefits Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

Preliminary estimates indicate that this ATC will result in a construction cost savings of \$2 million. Additionally, this ATC will decrease cost in the O&M term by approximately \$500,000.

**Total cost savings for this ATC is anticipated to be approximately \$2.5 million.**

## 6. Schedule Analysis

This information *has not been* amended since the submission of the previous version of this ATC.

While localized construction durations will be reduced, further schedule analysis is required to determine if there will be any significant schedule savings to the overall Project.

## 7. Conceptual Drawings

This information ***has been*** amended since the submission of the previous version of this ATC to include additional attachments.

**Attachment A:** Proposed electrical and UPS system one-line diagram

**Attachment B:** Proposed CCMS PLC and Network Architecture

**Attachment C:** Tracked changes to Schedule 10 Section 12 of the Project Agreement

## 8. Past Use

This information *has not been* amended since the submission of the previous version of this ATC.

Projects throughout the country have implemented elements of this proposed electrical system; however, each project must be designed to meet its unique needs and the requirements of the



local AHJ. This ATC will provide an electrical system design that is appropriate for the nature of this urban Cover structure which will be proven through good engineering practice.

## 9. Additional Information

This information *has been* amended since the submission of the previous version of this ATC to address the items included in the response to ATC 37.0 and ATC 37.1.

### **ATC 37.0 Comment #1**

*IEC 61508 is an internationally accepted standard. Please provide to what standard(s) KMP proposes in respect to redundancy and reliability of controls.*

#### **KMP Response:**

KMP is proposing to design the Cover CCMS PLC system to the Standards shown below:

- ANSI 37.1 Definition, Specification and Analysis of Systems Used for Supervisory Control and Data Acquisition, and Automatic Control
- NEMA IA2.1 Programmable Controllers - General Information
- NEMA IA2.2 Programmable Controllers - Equipment Requirements and Tests
- NEMA IA2.3 Programmable Controllers - Programming Languages
- NEMA IA2.4 Programmable Controllers – Part 4: User Guidelines.
- NEMA ICS1 Industrial Control and Systems General Requirements
- NEMA ICS1.1 Safety Guidelines for the Application, Installation and Maintenance of Solid State Control

KMP's intent is to implement a PLC architecture that is consistent with industry standard for roadway tunnels in the US through the use of equipment suitable for a resilient, reliable, and industrial control environment. Specifically, the proposed design is to use primary and standby PLC processors in separate racks, configured in a hot standby arrangement for automatic, uninterrupted switchover of the control program between processors, along with 2 redundant I/O communications networks to each field I/O drop, driven off of these processors as shown on the attached **Attachment B**.

### **ATC 37.0 Comment #2**

*Provide a power supply reliability analysis to demonstrate that the design meets the required level of safety meeting the PA requirements, US standards, US Codes of Practice, Guidance from Professional Bodies such as PIARC, and current technologies and practices in the US and internationally.*

#### **KMP Response:**

This comment pertained to the previously submitted ATC 37.1 alternate use of a separate utility service as the emergency source. The AHJ's experience with this approach for a different facility was found to be not as reliable as an on-site stand-alone generator which is preferred by the AHJ. Subsequent to ATC 37.1, our design approach has changed for this element to where an on-site stand-alone generator is now proposed for use as the emergency source, compliant with NFPA 502 and NEC Section 700.

KMP presented this approach directly to the AHJ in a confidential One-on-One Meeting on January 25, 2017. The AHJ indicated that this was acceptable and did not express any further

concerns from the AHJ's perspective. The AHJ did indicate that further coordination would be required with the city planning department for the final location of the generator. The Procuring Authority allowed the ATC to be resubmitted.

### **ATC 37.0 Comment #3**

*Provide examples of where this concept has been used in the past.*

#### **KMP Response:**

This comment pertained to the previously submitted ATC 37.1 alternate of using a separate utility service as the emergency source. The AHJ's experience with this approach for a different facility was found to be not as reliable as an on-site stand-alone generator which is preferred by the AHJ. Subsequent to ATC 37.1, our design approach has changed for this element to where an on-site stand-alone generator is now proposed for use as the emergency source, compliant with NFPA 502 and NEC Section 700.

### **ATC 37.1 Disapproval**

*Subsequent to sending the response to this ATC on September 12, 2016, the Procuring Authorities met with the AHJ regarding the concept presented in this ATC. The AHJ is not willing to approve this concept. Prior experience indicates that system reliability is a major problem with electrical systems designed in the manner presented in this ATC. A topic meeting has been scheduled with the AHJ for the end of January. If there is any feedback at the meeting that impacts this ATC, the ATC may be resubmitted for reconsideration.*

KMP presented the design concepts within this ATC directly to the AHJ in a confidential One-on-One Meeting on January 25, 2017. Feedback and results from that meeting indicated that the AHJ had no objections or concerns with the design concepts after presentation, to which the Procuring Authorities requested the ATC be resubmitted. KMP acknowledges the requirement to further coordinate the final design with the AHJ during the final design phase of the Project.

Specifically, the AHJ's concern with ATC 37.1 was with using the second utility source as the emergency source to comply with NFPA 502 and the NEC section 700. The AHJ indicated that this approach had been used before for different facilities and that it was not found to be as reliable as an on-site stand-alone generator which is preferred by the AHJ. KMP addressed this concern by explaining that since submission of the previous ATC, an on-site stand-alone generator was now proposed for use as the emergency source. This approach is compliant with NFPA 502 and NEC Section 700. The AHJ indicated that this was acceptable and did not express any further concerns.

## **C. Detailed ATC Requirements**

### **1. Risks**

There are no changes or additional risks to the Procuring Authorities, CDOT, the State, or third parties associated with implementation of the ATC.

### **2. Handback**

There are no significant changes in Handback procedures and/or the Handback Requirements associated with this ATC. This ATC will eliminate the need for the Department to maintain generators following handback.

### 3. Right-of-Way

No additional right-of-way is required to implement this ATC.

### 4. List of Required Approvals

There are no additional third party and Governmental Approvals, including any Design Exception, associated with this ATC.

### 5. Proposed Drafting Revisions

KMP has included the **Attachment C** with tracked changes for the changes in the sections listed above

a) RFP Requirements that are Inconsistent with Proposed ATC

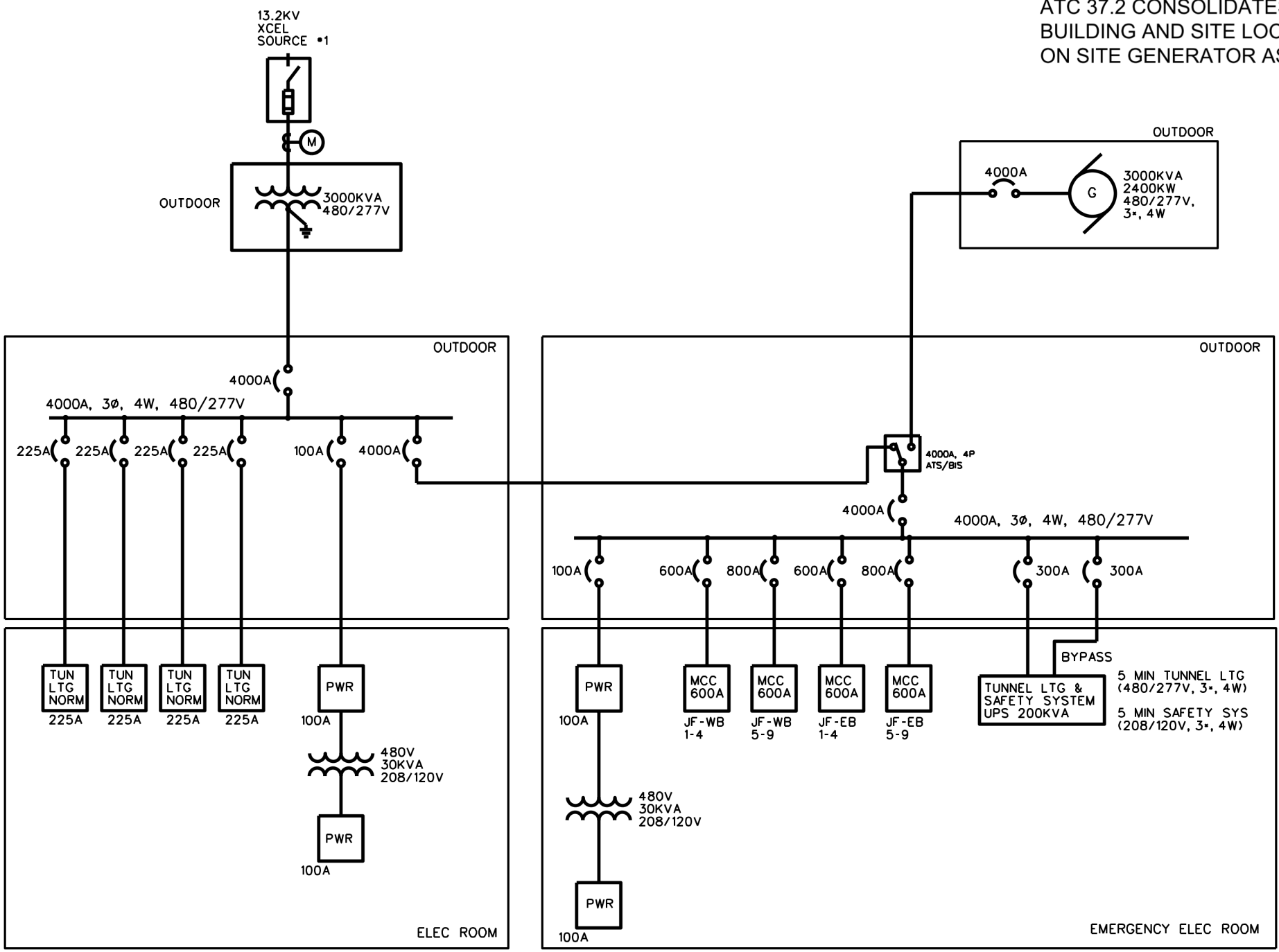
KMP requests that the following sections be revised for the exclusive use by KMP upon acceptance of this ATC.

1. Section 12 of Schedule 10 of the PA

b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment C** with tracked changes for the changes in the section listed above.

**NOTE:**  
 ATC 37.2 CONSOLIDATES EQUIPMENT INTO 1 SERVICE BUILDING AND SITE LOCATIONS, WITH STANDALONE, ON SITE GENERATOR AS EMERGENCY SOURCE.



REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	3

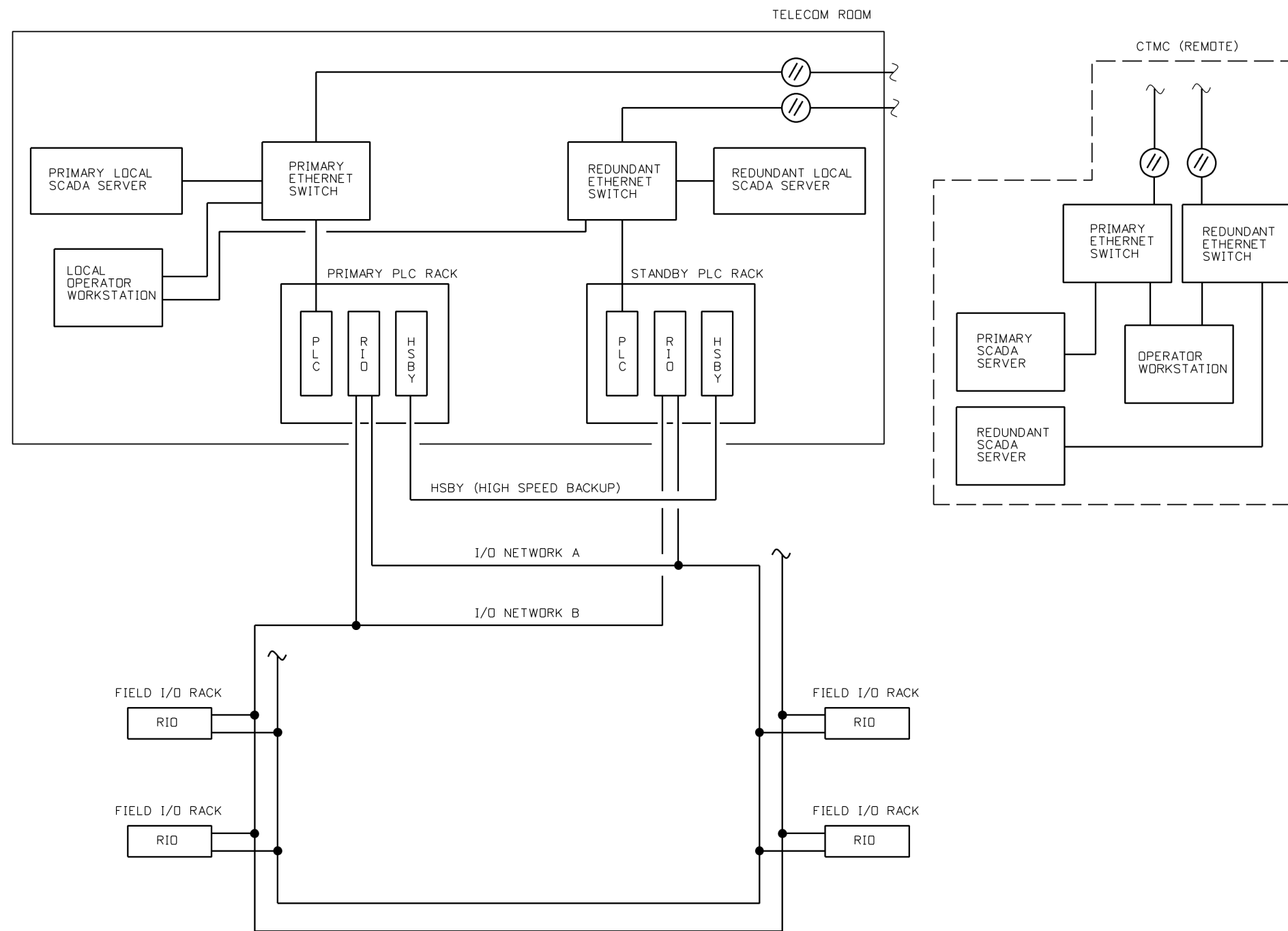
ALTERNATIVE TECHNICAL CONCEPT  
**COVER ELECTRICAL SYSTEMS**

ATTACHMENT A

ATC NUMBER  
**37.2**

SHEET NUMBER 1 OF 1





**LEGEND**

- P  
L  
C PROGRAMMABLE LOGIC CONTROLLER
- R  
I  
O REMOTE I/O NETWORK COMMUNICATIONS MODULE
- H  
S  
B  
Y HIGH SPEED COMMUNICATIONS BACKUP MODULE

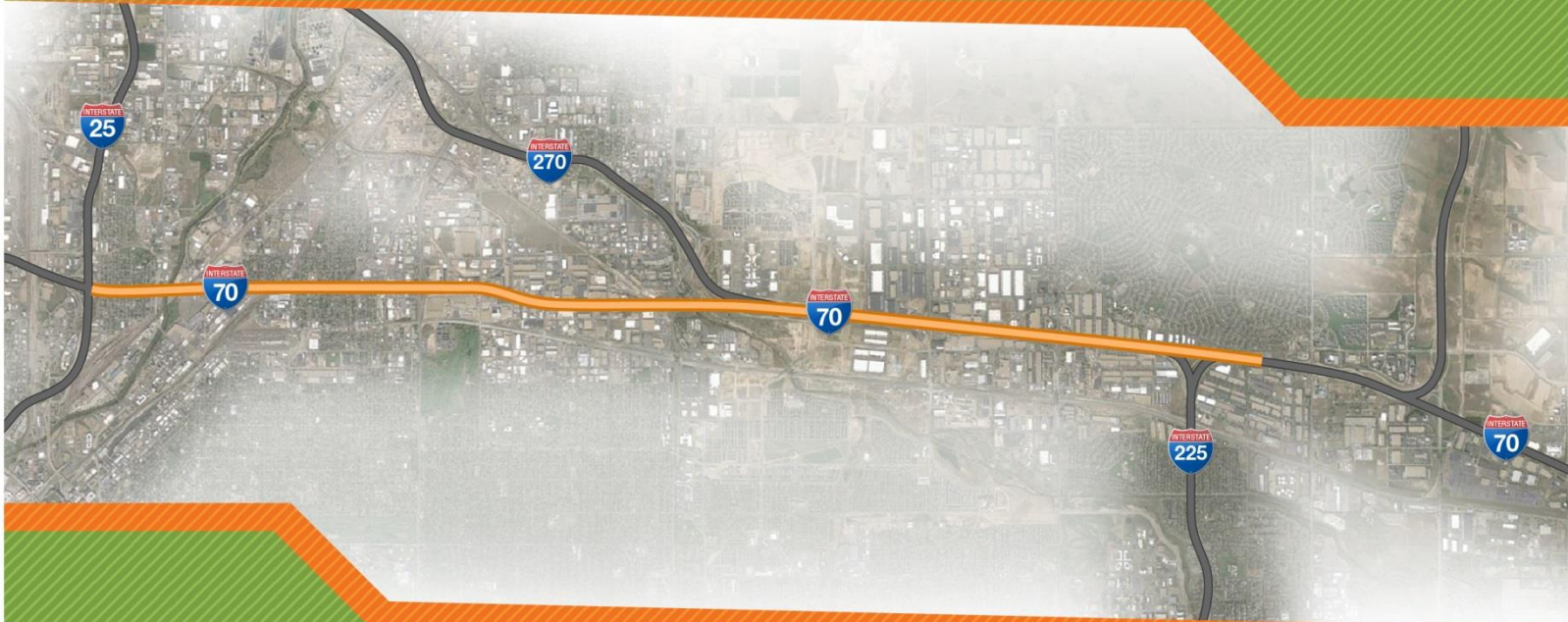
REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	3
B.8	PAST USE	4



# Central 70 Project

Attachment C – Tracked Changes to Section 12 of Schedule 10

ATC 37.2



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

February 22, 2017



- b. Proposed ventilation system type and supplier;
  - i. Proposed ventilation design process; and
  - ii. Approach to derivation of design adverse cover portal pressure condition;
- c. Proposed FFFS type and supplier;
- d. Fire detection system type, model and supplier;
- e. CCTV camera system type, model and supplier;
- f. Operator interface system;
- g. Monitoring and control system;
- h. Proposed system operation;
- i. Hydraulic and pneumatic calculations;
- j. Computational Fluid Dynamics (CFD) analysis process, model, cases and assumptions;
- k. Proposed approach to demonstrating FFFS performance;
- l. ~~Analysis of the safety functions for all fire and life safety systems as prescribed in IEX61508-1; Proposed approach to passive fire protection as prescribed in NFPA 502, Section 7.3~~
- m. Lighting and signing;
- n. ITS; and
- o. Drainage.

#### **12.12. Emergency Response Plan**

- 12.12.1. The Developer shall prepare an Emergency Response Plan (ERP), as described in NFPA 502. The Developer shall conduct coordination meetings with the Department and stakeholders including City of Denver Fire Department, to discuss the details of the Cover MEP System operation and Emergency procedures. Such meetings shall be held at various stages of design development including draft and final stages. Additional stakeholders are to be determined by CDOT and the AHJ. The ERP shall be submitted by the Developer to the Department for Acceptance at the same time as the Final Cover Design Baseline Report.
- 12.12.2. The Developer shall update the ERP and submit no later than 60 Calendar Days prior to opening of the Cover, or any part thereof, for Acceptance by the Department.

#### **12.13. Ventilation**

##### **12.13.1. Scope**

A Cover MEP System shall include a Cover Ventilation System (CVS). The scope of the CVS specification is limited to the ventilation of the Cover over I-70 Mainline only and excludes any plant room or service building ventilation systems.

##### **12.13.2. System Requirements**

The CVS shall be of longitudinal concept comprising jet fans. The system shall be developed for the following two principal operating modes:

- a. Normal and congested operations: in situations where the traffic induced airflow is insufficient to maintain vehicle emitted pollutants to within acceptable levels, additional airflow will be generated by the ventilation system; and
- b. Emergency operations: in the event of an Emergency incident, the ventilation system shall be operated to control the smoke and hot gasses and shall discharge the smoke and gases via the exit Portal.

- vii. Control the operation of the radio rebroadcast systems;
  - viii. Control the operation of the voice alarm and public address system;
  - ix. Monitor the status of the fire main system;
  - x. Monitor the status and manage alarms from the AID system;
  - xi. Monitor the status and manage alarms from the Fire Detection system;
  - xii. Monitor the status and manage alarms from the cross bore doors;
  - xiii. Monitor Plant Room systems including heating, ventilation, and air conditioning (HVAC), lighting, intruder alarm, fire alarm, FFFS etc;
  - xiv. Monitor the status and manage alarms from all environmental and other sensors;
  - xv. Monitor the status of the power distribution system; and
  - xvi. Request, via an appropriate interface, specific actions from the traffic management systems (including automatic responses to state changes and alarms from the systems being monitored).
- c. The CCMS shall be integrated with the Project ITS to allow the operators to manage and co-ordinate the operation of the I-70 Mainline in the Cover and along both approaches. The Developer shall be responsible for any integration necessary, including any required CTMS and Qognify software modifications. These include:
- i. LUS;
  - ii. DMS;
  - iii. Communications Systems;
  - iv. CCTV;
  - v. Ramp metering systems; and
  - vi. Vehicle detection systems.
- d. The CCMS shall be based upon a programmable logic controller (PLC) based Supervisory Control and Data Acquisition (SCADA) system. Configuration shall use primary and redundant PLC processor and power supply combination hubs configured in hot standby back up for uninterrupted control and monitoring. These PLC hubs shall be in physically separate cabinet locations from each other. These PLC hubs shall be connected to remote I/O (input/output) cabinets using fault tolerant, redundant, remote I/O communications links for a distributed I/O approach. Interfaces to systems both in the Cover, on the I70 Mainline and on the surface streets may be required.
- e. The Developer shall provide Cover operations staff to continuously monitor and control the Cover MEP System. Such staff shall:
- i. be co-located with CDOT ITS staff at the CTMC;
  - ii. be responsible for the remote control and monitoring of the Cover MEP System; and
  - iii. assist with Courtesy Patrol dispatch, general traffic, roadway, weather, construction and Special Event management, ATM, and Tolloed Express Lane system monitoring and operations.

CDOT ITS staff will cross-train Developer operations staff to assist with operator duties beyond the Cover MEP System (refer to Section 12.8 for Developer training requirements). CDOT will provide one seating area with a desk and computer for housing at the CTMC. Developer shall provide software, licensing, and remote access to all Cover MEP System



b. Cable Management System

A full cable management system will be provided in the cornice on each side of the roadway and on the soffit on the centerline of the roadway. The cable management system will be provided using open high corrosion resistance stainless steel cable tray, trunking or conduit.

c. Cabling Requirements

Cables installed in the Cover shall be constructed using low smoke and fume insulation. Cables containing halogens will not be permitted in the Cover. Cabling for essential and life-safety systems shall be constructed from fire survivable materials.

## 12.18. Electrical Systems

### 12.18.1. Basis of design

The Developer shall design, provide, install, test and commission all electrical power systems in accordance with the appropriate NFPA standards or other such applicable standards and specifications of the AHJ. The Developer shall allow attendance at all performance testing and demonstrations by the Department and relevant Local Agencies or appointed representatives. The Developer shall undertake all necessary surveys and investigations to validate its design including, but not limited to utility surveys, investigations, enquiries with relevant Governmental Authorities and for obtaining all necessary Governmental Authorities.

### 12.18.2. Design Criteria – Electrical Power

- a. The Developer shall verify with the AHJ whether the requirements of NFPA 502 – Chapter 12 Electrical Systems (clause 12.1.5) are to be incorporated into the design.
- b. The electrical systems shall be designed to support life safety operations, fire Emergency operations, and normal operations. The electrical systems shall be designed to allow for routine maintenance without disruption of traffic operation.
- c. ~~The main electrical distribution shall be configured, interconnected and controlled to allow all services to the Cover to remain operational in the event of a single power supply transformer failure in the substation at either end of the Cover.~~ The main electrical distribution shall be configured, interconnected and controlled to allow all services to the Cover to remain operational in the event of the utility power supply transformer failure at the end of the Cover.
- d. Main low voltage switchboards shall be configured with interlocking switchgear to allow for Emergency standby generator installation to be connected to serve all essential services supplies to the Cover.
- e. Diesel generator shall be provided for backup purposes in order to run the Cover in the event of a failure of the utility electrical supply.

### 12.18.3. Design Criteria – Emergency Power

a. Emergency Standby Generator

Emergency Power shall be provided by an Emergency standby generator in accordance with Article 700 of NFPA 70. (For Emergency and standby power systems as NFPA 110).

b. The following systems shall be connected to the Emergency power system:

- i. Emergency lighting;
- ii. CCMS and ITS;
- iii. Exit signs;
- iv. Emergency communications;
- v. Cover drainage monitoring;

- vi. Emergency ventilation;
  - vii. Fire alarm and detection;
  - viii. Closed-circuit television or video; and
  - ix. FFFS.
- c. Emergency Power Circuits
- Emergency circuits installed in the Cover and ancillary areas shall remain functional for a period of not less than one hour, for the anticipated fire condition.
- d. Emergency circuits shall comprise one of the following:
- i. Fire-resistive cables;
  - ii. Circuits embedded in concrete that are protected by a two-hour fire barrier system; and
  - iii. By the routing of the cable system external to the roadway using diversity in system routing as approved, such as separate redundant or multiple circuits separated by a one hour fire barrier, so that a single fire or Emergency event will not lead to a failure of the system.
- e. Emergency Power UPS System
- i. ~~Two separate UPS systems shall be provided with each of the services buildings located near each end of the Cover. One of these will feed the lighting system whilst the other will feed the remaining safety critical plant. Single UPS system shall be provided within the emergency electrical room. UPS system shall jointly serve the lighting system and the remaining safety critical plant.~~
  - ii. Single UPS system shall be provided within the emergency electrical room. UPS system shall jointly serve the lighting system and the remaining safety critical plant.
  - iii. The UPS specification shall be developed based on the following;
    - A. ~~Three phase, on-line, double-conversion, static-type, UPS unitys with 120 minute battery Autonomy; Three-phase, on-line, double-conversion, static-type, UPS units with 5 minute battery Autonomy to override momentary outage during transfer from normal to emergency source;~~
    - B. 20% Spare capacity;
    - C. N+1 parallel redundant configuration; and
    - D. External wraparound bypass unit

#### 12.18.4. Design Criteria – Containment

Containment shall be provided throughout the Cover for all cabling services. Separate containment systems shall be provided for power and control/communications cabling, segregated in line with Good Industry Practice. Armored cables shall be run on cable trays with non-armored cables run in trunking or conduit to suit the required routing. Control and communications cables shall be run in conduit.

#### 12.18.5. Design Criteria – Cabling

All cables and associated materials shall be insulated or clad using low smoke, zero halogen (LSOH) materials and where required, certain cables will be fire survivable cables.

### 12.19. Lighting

#### 12.19.1. Scope



DATE: July 8, 2016

TO: Kiewit-Meridiam Partners (KMP)

FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Initial Conceptual Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 38.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Conceptual ATC 37.0 has been reviewed by the Procuring Authorities. As discussed during the June One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Conceptual ATC. The ATC proposes to use innovative precast pre-tensioned girders for highway bridges to optimize construction efficiencies on the Project.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Conceptual ATC:

- 1. unconditional approval and waiver of requirement for re-submission as a Detailed ATC;
- 2. unconditional approval for re-submission as a Detailed ATC;
- 3. conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions;
- 4. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 5. notification that the inclusion of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP; or
- 6. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

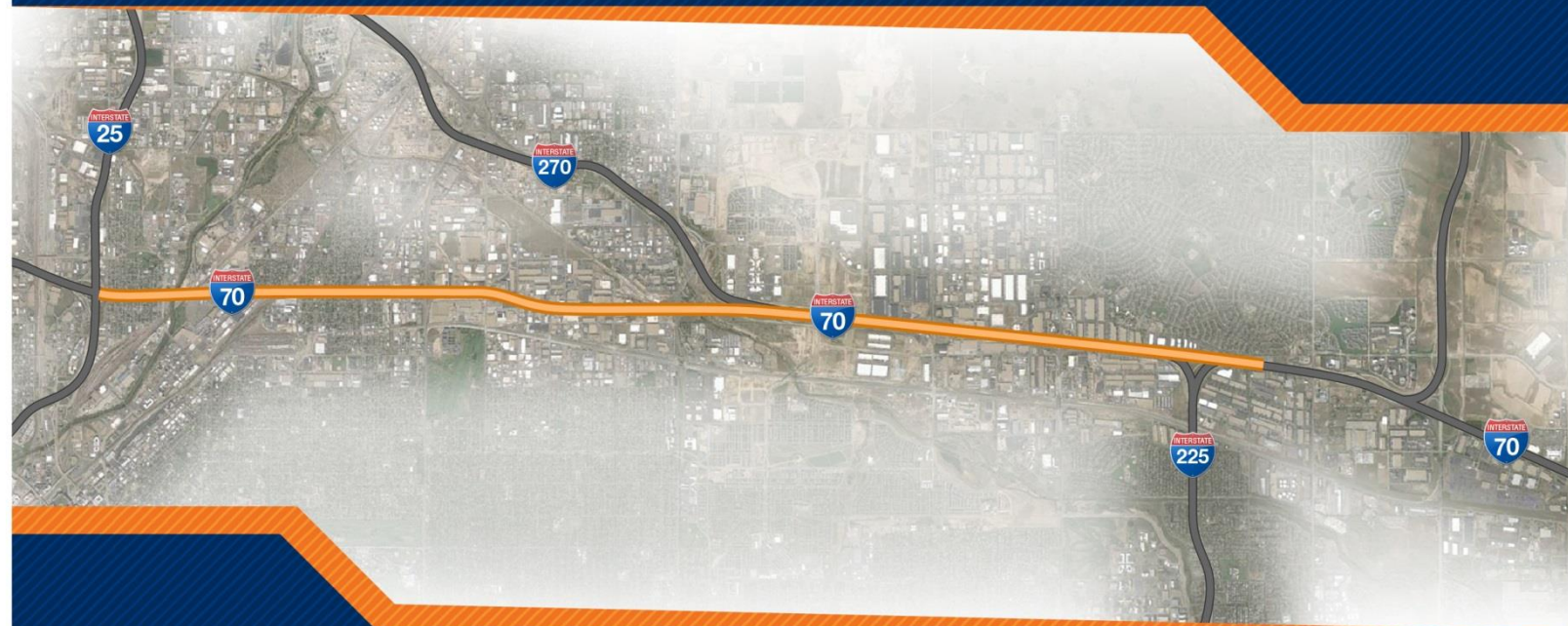




# Central 70 Project

Alternative Technical Concept Submission

ATC 38.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Conceptual ATC Submission

June 14, 2016



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners  
**Date:** June 14, 2016  
**Central 70 Project RFP: ATC Submission No. 38.0**  
**Non-Standard Precast Girders**

### A. Background Information

#### 1. Type of Submission

- Conceptual ATC
- Detailed ATC

#### 2. Prior Submission

- None (initial submission of ATC)
- Previously Submitted as Conceptual ATC
- Previously Submitted as Detailed ATC

#### 3. Explanation of Reason for Resubmission

Not Applicable

#### 4. Request for Discussion at One-on-One Meeting

- Meeting Requested
- Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

Kiewit-Meridiam Partners (KMP) is proposing to use innovative precast pre-tensioned girders for highway bridges to optimize construction efficiencies on the Project. Numerous agencies across the United States have recently developed and implemented more efficient precast girders into their standard inventory. These girders achieve increased span lengths, wider spacing, and decreased girder heights while reducing cast-in-place (CIP) deck concrete and associated formwork. They have succeeded in reducing impacts to the traveling public while providing an economic benefit; hence the nationwide trend. This ATC is proposing to use bridge girder shapes similar to what is being adopted by other agencies around the country. The design basis for these girders will be identical to the existing girder shapes contained in CDOT Staff Bridge Worksheets, Series B-618, however the cross-section dimensions are different.

#### 2. Relevant RFP Requirements

Schedule 10, Section 13.1.2 of the Project Agreement (PA) encourages Proposers to use innovative technologies to accomplish efficient construction and produce safe bridges.

Schedule 10, Section 13.5.4.c of the PA, prescribes all proposed girder types are capable of providing continuity over piers and compatible with integral or semi-integral abutments.

Section 13.5.4 of the PA specifies bridge types are not necessarily restricted to those historically used by the Department, and that alternate components can be submitted for approval based on evaluation of prior implementation with acceptable performance.

### ATC 38.0 Benefits

- ✓ Optimizes pre-stressed girder bridge design
- ✓ Reduced superstructure depth to optimize excavation, fill, and wall quantities
- ✓ Provides proven performance in prior implementation
- ✓ Shortens localized bridge construction durations

This ATC serves to gain approval for the use of innovative components for highway superstructure while meeting the requirements for continuity over piers and compatibility with integral or semi-integral abutments.

### 3. Rationale

KMP is proposing to provide equal or better solutions through innovative girder types that produce significant benefits to the Project. Based on analysis of girder types used in other similar geographies, this ATC proposes the use of the girder shapes described below:

#### Proposed Bulb Tee Girder

The Utah Bulb Tee (UBT) has been implemented as a state standard and is commonly used with both precast deck panels and CIP decks. The UBT is similar to the CDOT BT girder but has wider top and bottom flanges that make it a more efficient girder. For a similar girder depth, the UBT can typically be designed at a wider spacing thereby reducing the number of girders required for the bridge width. For a similar bridge span length, the UBT can typically be designed with a reduced girder depth providing clearance benefits for the crossing roadways.

#### Proposed Wide Flange Thin Deck (WFTD) Girder

The Washington State DOT WFTD girder is similar to a bulb tee girder with a three-inch thick portion of the top flange extended laterally to create a top flange width up to eight feet. This WFTD girder is designed and constructed with its top flanges abutting one another which eliminates deck formwork, a significant time and cost savings. A minimum 5 in. thick cast-in-place deck connects the girders and also creates an 8 in. thick composite deck in accordance with Schedule 10, Section 13.5.6.d.i of the PA. This deck system is similar to the concept which CDOT uses for adjacent precast slabs and boxes. This girder is also very efficient. It allows the girder depth to be reduced for comparable span lengths. This reduces construction costs by decreasing the amount of excavation in the Lowered Section, requiring less embankment east of Colorado Blvd., and reducing retaining wall quantities.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** This ATC will improve the safety of the workforce and public by reducing the duration of localized construction operations. UBT's will reduce the crane pick risks by optimizing the number of girders required. The WFTD girders will reduce the need for precast panel crane picks or formwork required for typical CIP decks on precast girder bridges.
- **Optimize the Scope:** More efficient girders will decrease superstructure depths which will contribute to raising the profile of I-70 mainline resulting in optimized clearances, reduced wall heights and excavation quantities while minimizing the impacts associated with groundwater.
- **Optimize Operating and Life Cycle Costs:** Maintenance costs for bridges will not change with implementation of this ATC. There will be savings throughout the operations and maintenance period by minimizing need for long term management of groundwater in the Lowered Section by raising the I-70 profile.
- **Minimize Impacts to the Traveling Public:** Reducing the localized bridge construction activity durations will improve community connectivity by reopening cross-streets

sooner. This is important to both residents of the nearby neighborhoods and the commercial properties that abut the corridor.

## 4. Impacts

This ATC does not present potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. KMP's design will be fully compliant with the PA and will not negatively impact highway bridges. Approval of this ATC will positively impact the Project through:

- **Environmental Sustainability:** This ATC will minimize the environmental concerns associated with handling, disposal, and treatment of groundwater throughout the construction duration as well as the operations and maintenance period. Additionally, this ATC reduces construction activities and quantities. This will reduce equipment operating times and will require fewer precast girder deliveries thereby reducing Project emissions.
- **Neighborhood Impacts:** Decreasing localized construction durations and traffic will minimize impacts to the local neighborhoods through an expedited delivery of cross-street bridges and local connectivity.

## 5. Cost and Benefits Analysis

This ATC will reduce Project costs by reducing overall bridge quantities and shortening the overall construction schedule. **Initial cost analysis indicates an overall savings to the Project of approximately \$2 million.**

## 6. Schedule Analysis

KMP anticipates localized construction durations will be reduced by approximately 10-15% over the standard CDOT BT girder shape. KMP is still evaluating the schedule impacts but an overall schedule savings for the Project is anticipated as several bridges are currently shown on, or near, the critical path.

## 7. Conceptual Drawings

**Attachment A:** Typical sections of the UBT girder shape and Washington State DOT WFTD girder shape.

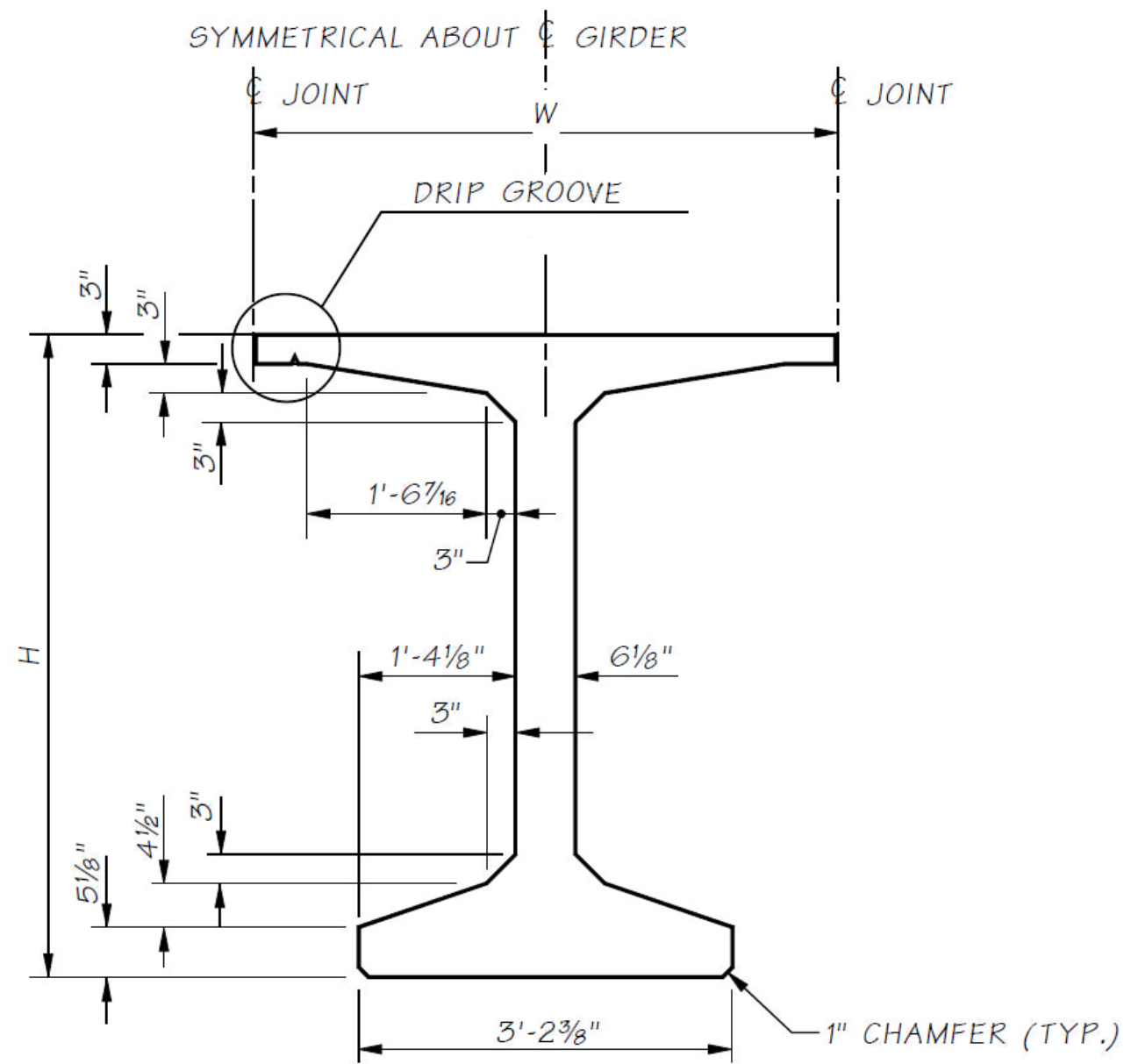
## 8. Past Use

UBT: Utah DOT uses this girder as their preferred standard precast girder. Numerous bridges in Utah have utilized this girder including I-15 CORE, I-15 South Davis, and Mountain View Corridor which were designed by KMP team members.

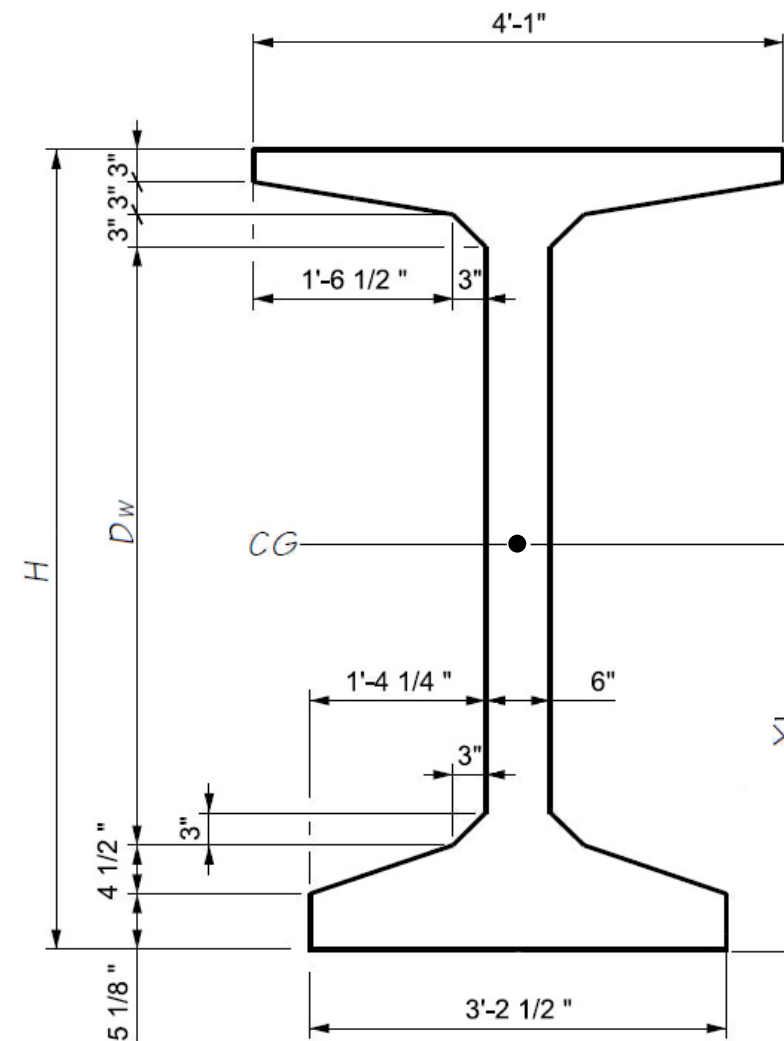
Wide Flange Thin Deck girder: This approach has successfully been used on the Deep Creek Bridge Replacement in Spokane, Washington, [Thin Decked Girder Application](#).

## 9. Additional Information

N/A



**WSDOT WFxxTDG Girder**



**UDOT UBT Girder**





DATE: August 4, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 42.0

Dear Mr. John Dionisio:

Your Team's ATC Submission Form for Detailed ATC 42.0 has been reviewed by the Procuring Authorities.

Detailed ATC 42.0 proposes to use AASHTO LRFD in place of the CDOT Bridge Design Manual for bridge deck overhang dimension criteria.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of Approval:

- 1. The Developer is responsible for any damage to the deck, girder, or corresponding structural components that results from an increased deck overhang. Any damage shall be repaired or replaced by the Developer.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

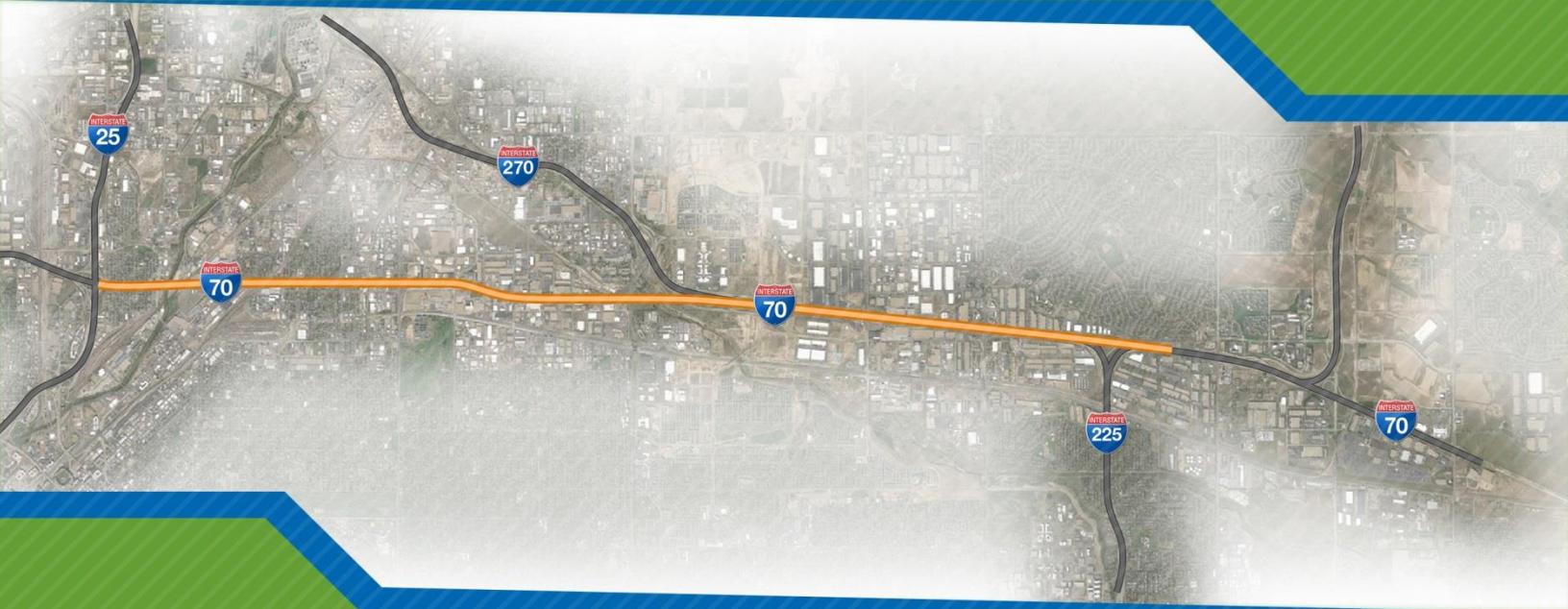




# Central 70 Project

Alternative Technical Concept Submission

ATC 42.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 42.0**

**Increased Deck Overhang Allowance**

### A. Background Information

#### 1. Type of Submission

Conceptual ATC

Detailed ATC

*KMP has prepared this ATC as a Detailed Submission with no previous Conceptual Submission for the efficiency of all parties. This ATC meets all requirements of a Detailed Submission and no further information*

#### 2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

#### 3. Explanation of Reason for Resubmission

Not Applicable

#### 4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### ATC 42.0 Benefits

- ✓ Optimizes the scope
- ✓ Minimizes impacts to the public
- ✓ Equal or better performance and reliability
- ✓ Improved Project safety by erecting less girders
- ✓ Decreased girder quantities
- ✓ Improved public safety by erecting less girders

### B. General ATC Submission Requirements

#### 1. Overview Description

Kiewit-Meridiam Partners (KMP) is proposing to use AASHTO Load and Resistance Factor Design Bridge Design Specifications (LRFD) in place of the CDOT Bridge Design Manual (BDM) for bridge deck overhang dimension criteria. This proposed modification to the bridge deck overhang dimension criteria has been approved by Staff Bridge on several projects throughout Colorado due to the opportunities to maximize the efficiency of girder systems.

#### 2. Relevant RFP Requirements

KMP requests modifications to the Project Agreement (PA) to allow for use of AASHTO LRFD in place of the CDOT BDM for bridge deck overhang dimension criteria. This will require modifications to Schedule 10, Section 13.2.1 of the PA. It states "AASHTO Load and Resistance Factor Design Standard Specifications shall be used for all new structures", but it also states "The CDOT bridge design and policy manual should be followed." The CDOT BDM language eliminates the ability to truly design overhangs to the AASHTO LRFD criteria.

CDOT BDM specifies restrictive criteria for bridge deck overhang dimensions, including a maximum overhang width of  $S/3$  (where  $S$  is the girder spacing).

AASHTO LRFD Section A4 has deck slab design tables with the maximum total overhang width equal to the smaller of 0.625 times the girder spacing and 6.0 ft. AASHTO LRFD Section 6.11.2.3 further limits the deck overhang on steel multiple box section bridges to 60 percent of the average distance between the centers of the top steel flanges of adjacent box sections or 6.0 ft.

### 3. Rationale

This ATC provides KMP with the flexibility to design bridge overhangs with AASHTO LRFD requirements. Bridge overhangs will be designed in conjunction with the CDOT Standard Specifications for Road and Bridge Construction (Standard Specifications) which specifies that the stability of the structure during construction is the Contractor's responsibility, as shown in Erection Plans. This approach has been successfully used on past projects throughout Colorado.

The CDOT BDM specifies more stringent bridge deck overhang criteria to eliminate potential construction problems due to screed rail loads and construction loads. KMP can accomplish the same intent through prudent engineering and compliance with AASHTO LRFD requirements. To eliminate potential construction problems, KMP will analyze each bridge and its overhangs to provide full capacity for all construction loads and determine alternate solutions. Requiring the screed rail to be placed over the girder flange, reducing the screed rail load concern, is one typical potential solution.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** Allowing flexibility in the overhang dimension will reduce the number of girders to be erected thereby decreasing the exposure of risk to the workforce and public.
- **Optimization of Scope:** Reducing girder quantities and increasing efficiency of overhang construction optimizes the scope and allows KMP to focus limited resources on other parts of the Project to maximize effectiveness.
- **Optimization of the Lifecycle Maintenance Costs:** Fewer girders equates to fewer bearings and less structural components, which will reduce long-term maintenance costs.
- **Minimize Impacts:** Fewer girders required for bridge erection will reduce the closure windows needed at critical locations along I-70. Reducing the localized bridge construction durations will improve community connectivity by reopening cross-streets sooner. This is important to both residents of the nearby neighborhoods and the commercial properties adjacent to the corridor.

### 4. Impacts.

This ATC does not present potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. KMP's design will be fully compliant with the PA and will not negatively impact highway bridges.



This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** This ATC is in alignment with CDOT's Sustainability Program. Reduction in girder quantities and construction time will directly correlate to a reduction in emissions, waste, and energy use.
- **Neighborhood impacts:** By reducing localized construction durations, neighborhood impacts will be minimized allowing cross-streets to open sooner.

## 5. Cost and Benefits Analysis

This ATC will reduce Project costs by reducing overall bridge quantities and shortening the overall construction schedule. **Initial cost analysis indicates an overall savings to the Project of approximately \$500,000.**

## 6. Schedule Analysis

While localized construction durations will be reduced, KMP is still evaluating the potential schedule savings to the overall Project. Currently, several bridges are shown on, or near, the critical path of the schedule.

## 7. Conceptual Drawings

**Attachment A:** tracked changes to Section 13.2.1 and 13.5.6.d of Schedule 10

## 8. Past Use

Through Coordination with Staff Bridge, this approach has been implemented on a case-by-case basis on projects throughout Colorado. Specifically, bridge deck overhangs exceeding the CDOT BDM criteria were utilized on the US36 Design-Build Project for most bridges within the project. Most bridges only exceeded this requirement by approximately 10%-15%.

Additionally, several states do not have requirements limiting the overhangs beyond AASHTO LRFD values. Washington DOT (WSDOT) Bridge Design Manual states "A deck overhang of approximately one-half the girder spacing generally gives satisfactory results." Nevada DOT (NDOT) Structures Manual states "Typically, NDOT practice is that the overhang width will not be more than 40% of the girder spacing."

## 9. Additional Information

N/A

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

### 4. List of Required Approvals

Implementation of this ATC will require coordination and approval from Staff Bridge during final design.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10 Section 13.2.1 and 13.5.6.d of the PA

#### b) Proposed Revisions to address Inconsistencies

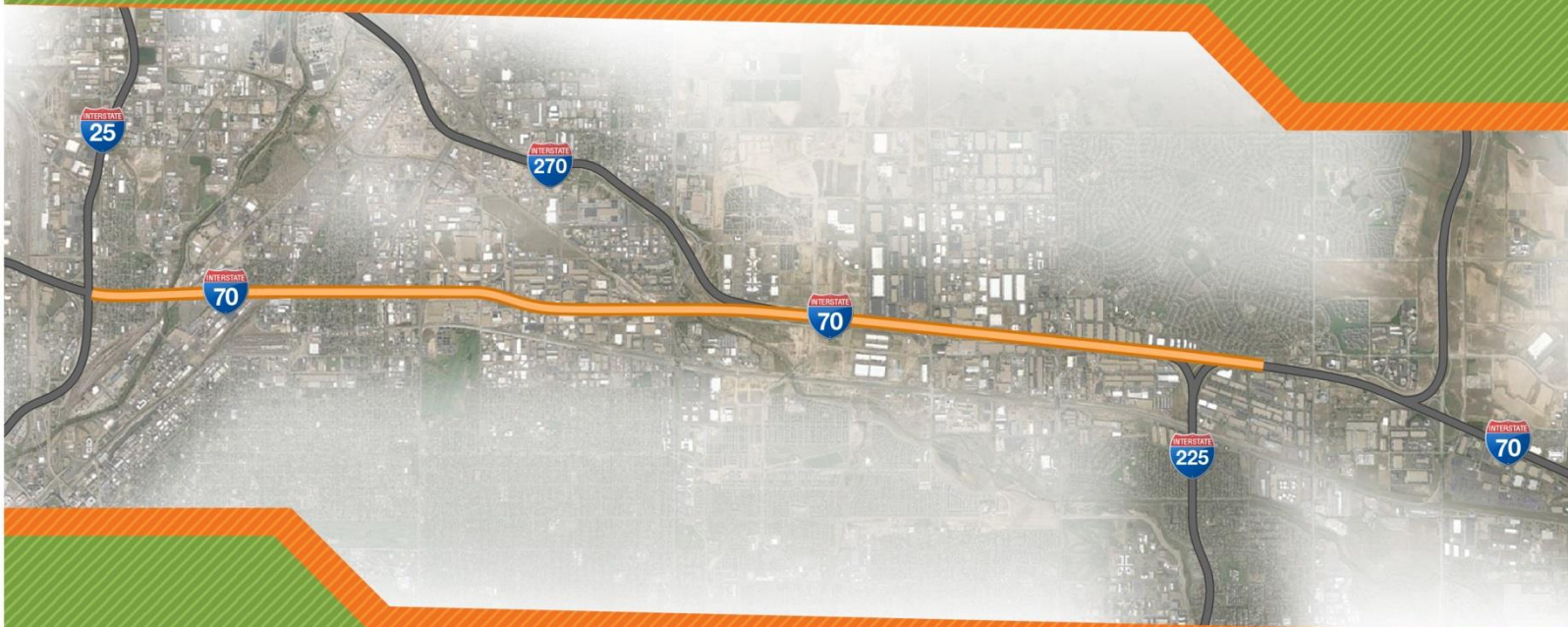
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 13 of Schedule 10

ATC 42.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016



### 13. STRUCTURES

#### 13.1. General

13.1.1. The Developer shall design and construct all structures required to meet the Project requirements and make the Project fully functional in accordance with the requirements of the Project Agreement and this Section 13.

13.1.2. To advance longer-lasting highways, the Department encourages using innovative technologies and practices to accomplish the fast construction of efficient and safe highways and bridges. Consideration by the Developer of state-of-the-art technologies and elevated performance standards that result in improved safety, faster construction, reduced congestion from construction, improved quality, and user satisfaction are encouraged.

13.1.3. All construction, reconstruction and rehabilitation of structures shall be designed and constructed to the Ultimate configuration geometric requirements.

#### 13.2. Applicable Standards and Software

13.2.1. AASHTO Load and Resistance Factor Design Standard Specifications shall be used for all new structures. For modifications to existing structures, the Developer has the option of using LRFD Specifications or the specifications which were used for the original design. The CDOT bridge design and policy manual should be followed, except as otherwise noted in this Section 13.5.6.d.viii.

13.2.2. Collision load (CT) shall be in accordance with AASHTO LRFD Bridge Design Specifications. The use of a TL-5 barrier in accordance with AASHTO Sect. 3.6.5.1 is allowed.

13.2.3. All Construction Work required to be performed by the Developer pursuant to this Section shall comply with the Construction Standards, the relevant requirements listed in this Section 13, and Good Industry Practice.

#### 13.2.4. Railroad Grade Separations

a. The Developer shall coordinate with the Railroads in accordance with Schedule 10, Section 10 Railroads for any structures Construction Work within Railroad right-of-way or affecting Railroad operations.

b. All Railroad grade separation structures shall be designed and constructed in accordance with the BNSF Railway-Union Pacific Railroad *Guidelines for Railroad Grade Separation Projects* and the American Railway Engineering and Maintenance-of-Way Association (AREMA) *Manual for Railway Engineering*. Structures, including permanent and temporary structures, shall be coordinated with the respective Railroads and are required to meet all applicable requirements.

#### 13.2.5. Structure Aesthetics

The Developer shall comply with Schedule 10, Section 14 Landscaping and Aesthetics in its design and shall comply with the specified materials and finishes treatments, concepts and details for all components of all structures (bridges, retaining walls, noise walls, sign structures, etc.).

#### 13.2.6. Load Rating

a. Load rating methodology shall be In accordance with CDOT's Load Rating Manual and policy, and the AASHTO Manual of Bridge Evaluation.

b. The Developer shall review the latest inspection reports, As-Built plans and carry out visual inspections to load rate the existing bridges.

c. Thrust shall not be used in the design or rating of buried culverts.

d. Bridges and major culverts under railway tracks shall be rated in accordance with AREMA. For all other structures, the following rating software shall be used for the Project:

i. AASHTOWare BrR, Bridge Load Rating; and



function as a barrier to keep water out of the joint between wingwalls or retaining walls and along the edge of approach slab. The approach slab, for highway bridges, shall be at least the same width as the bridge deck, and provide for expansion and contraction at the approach pavement interface where required. Approach slabs shall be anchored to the abutment.

- ii. The design shall include an underdrain system beneath all approach slabs to reduce water in embankment fills at bridge abutments.
- iii. The approach slabs shall be designed for differential settlement such that they will not produce a grade break that is noticeable to the user and shall not be more than one inch within one year of opening to traffic. The Developer shall implement ground-improvement techniques to the approach embankment subgrade, if necessary, to meet this requirement.

d. Decks

- i. The Developer shall provide a minimum concrete deck thickness of eight inches. Deck thickness for prefabricated pedestrian truss bridges or side by side precast prestressed box or slab bridges shall be 5 inches minimum.
- ii. Open or filled grating decks, cast-in-place bare decks, and orthotropic decks shall not be permitted. Concrete decks designed by the simplified "Ontario", or any empirical methods, shall not be permitted.
- iii. Full-depth precast deck slabs shall require cast-in-place joint closures and post tensioning across joints and an overlay. Pretensioned, precast concrete deck forms shall be a minimum of three inches thick and have a full grout or concrete bearing. Full grout is defined as a one inch minimum thickness by two inch wide grout pad.
- iv. Stay-in-place metal deck forms are permitted. If stay-in-place metal forms are used, the superstructure, substructure, and foundation shall be designed for an extra five psf minimum dead load applied to the superstructure. Stay-in-place metal deck forms shall not be considered part of the structural deck.
- v. Parallel bridges shall have a minimum one inch (four inch preferred) longitudinal gap between decks or parapets, or shall be tied together to make one structure.
- vi. Permanent deck forms shall not be permitted between girders or stringers where the longitudinal deck joint is located. Permanent deck forms shall not be permitted for cast-in-place post-tensioned box girder or T-girder deck slabs, or cantilevered portions of decks. In order for the cast-in-place portion of concrete placed on top of the top flange of a precast double tee or precast box girder to be considered composite with the precast top flange, the minimum total laminated deck thickness shall be eight inches, the minimum cast-in-place thickness shall be 4-3/4 inches, and the top surface of the precast top flange shall be roughened.

vii. Minimum longitudinal steel in the top mat of cast-in-place decks shall be #4s at six inch spacing spliced to the negative-moment steel reinforcing.

vii-viii. Bridge deck overhangs shall be designed to meet AASHTO LRFD design requirements, with the overhang limitations of CDOT Bridge Design Manual eliminated when the Developer appropriately designs the overhang for all screed rail loads and construction loads.

e. Deck Joints

- i. Deck design shall avoid or minimize joints in accordance with the guidelines in CDOT *Bridge Design Manual*. A minimum of zero to four inch joint shall be placed at the end of approach slabs or locations of expansion devices shall



DATE: August 4, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 43.0

Dear Mr. John Dionisio:

Your Team’s ATC Submission Form for Detailed ATC 43.0 has been reviewed by the Procuring Authorities.

Detailed ATC 43.0 proposes reconstruction with a high-performance pavement design alternative at select locations along the project from Colorado Blvd. to Sand Creek Bridge.

In accordance with the Instructions to Proposers (“ITP”), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer’s Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



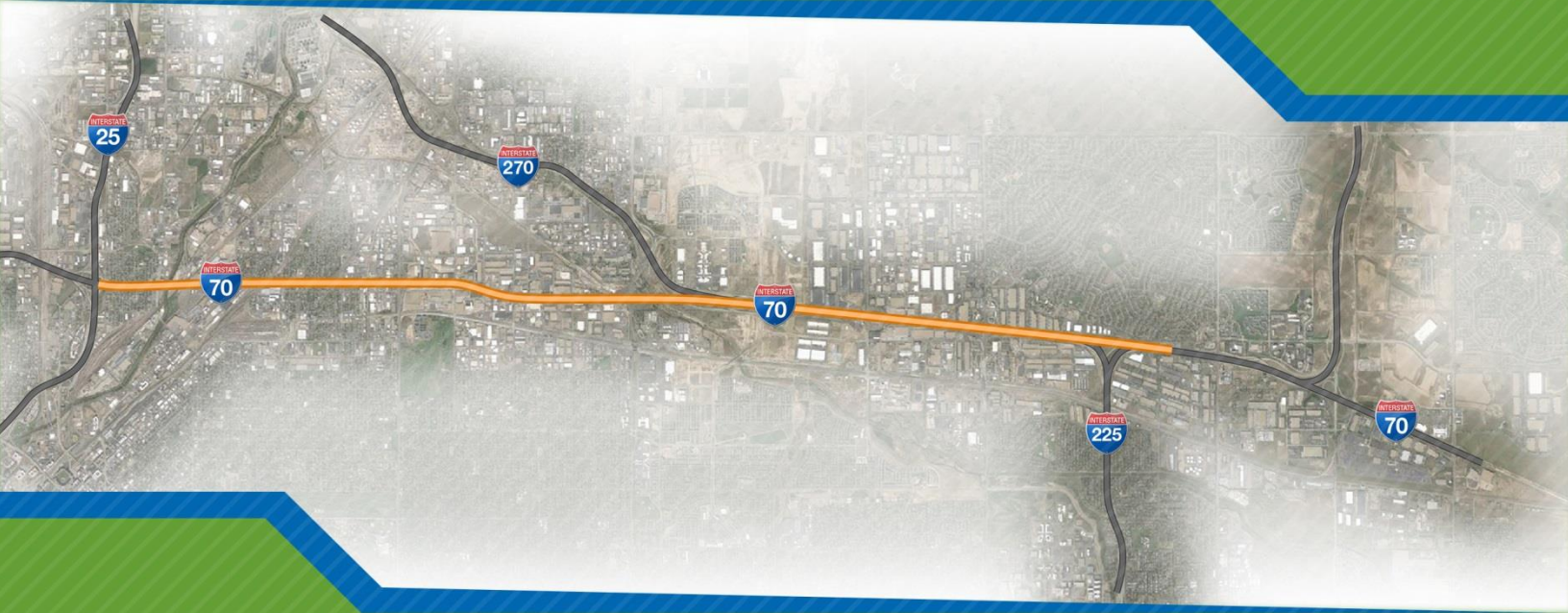




# Central 70 Project

Alternative Technical Concept Submission

ATC 43.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 43.0**

**High-Performance Pavement Reconstruction Alternative  
Colorado Blvd. to Sand Creek Bridge**

### A. Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

*KMP has prepared this ATC as a Detailed Submission with no previous Conceptual Submission for the efficiency of all parties. This ATC meets all requirements of a Detailed Submission and no further information*

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

N/A

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### ATC 43.0 Benefits

- ✓ Provides equal or better performance and reliability
- ✓ Utilizes common and proven pavement design
- ✓ Optimizes construction and life cycle maintenance costs
- ✓ Minimizes impacts to travelling public

### B. General ATC Submission Requirements

#### 1. Overview Description

Kiewit-Meridiam Partners (KMP) proposes reconstruction with a high-performance pavement design alternative at select locations along the project from Colorado Blvd. to Sand Creek Bridge. The alternative reconstruction method utilizes the strength and stability of the existing pavement, augmenting with additional pavement structure to provide equal or better performance compared to full reconstruction (removal and replacement). The proposed reconstruction alternative will be engineered to meet the same 40-year pavement performance period (30 year Term and 10 year Handback) used for other pavements along the Project.

The intent of this ATC is to deliver the best value for the Project by selecting a reconstruction alternative that is optimized to meet both performance and cost requirements, while at the same time reducing performance risk. This alternative will also expedite construction, improve safety, and reduce impacts to the traveling public.



Engineering the high-performance reconstruction alternative begins with a detailed characterization of the existing pavement structure between Colorado Blvd. and Sand Creek Bridge. From both as-builts and cores from pavements to the east, the existing pavement structure appears to include 8 in. of PCCP overlaid with between 4 and 24 in. of HMA. Falling weight deflectometer, ground penetrating radar, and cores of the existing pavement will be used to verify thicknesses and to characterize the structural capacity of the existing pavement.

Design will proceed with the objective of a new pavement and a 40-year performance period. The same design assumptions, inputs, and methodologies will be used as that of newly constructed pavements elsewhere on the Project. But in this instance, the design will take advantage of the stable support and the structural capacity provided by the existing pavement. Additional checks will be made regarding the location of the longitudinal joint with respect to the wheel path.

## 2. Relevant RFP Requirements

Section 9.4.1.d of Schedule 10 of the Project Agreement (PA) states:

*Colorado Blvd. to Sand Creek Bridge: **Full** Reconstruction of Highway on alignment*

And in subsection 9.4.1.d.i:

*The I-70 Mainline shall be reconstructed to provide three General Purpose Lanes and two Ultimate Tolled Express Lanes with associated ITS infrastructure in each direction, extending **full** reconstruction of the I-70 Mainline to the west side of the existing Sand Creek bridge.*

And in subsection 9.4.2.d.i:

***Full** reconstruction of the I-70 Mainline shall extend to the existing Sand Creek Bridge.*

In these three sections, it is proposed to delete the term “full” (where emphasis is provided above). When combined with approval of the concept presented herein, this would permit use of the high-performance alternative reconstruction methodology.

## 3. Rationale

This ATC will allow KMP the option of using a high-performance reconstruction design that achieves equal or better pavement performance while reducing cost and performance risk.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** Efficient construction by utilizing the existing pavement structure will limit the exposure of more extensive and intrusive construction operations to the workforce and traveling public.
- **Optimization of Scope:** This ATC will achieve equivalent performance as a full reconstruction but at a reduced cost, providing the Department an optimized scope.
- **Optimization of the Life Cycle Maintenance Costs:** The long term pavement management strategy for the high-performance reconstruction alternative will be comparable to that of a full reconstruction. When coupled with the reduced initial cost, there will be a decrease in life cycle costs.

- **Minimize Impacts:** The alternative pavement reconstruction proposed in this ATC will reduce the duration of traffic disruptions compared to durations associated with full reconstruction.
- **Ensures Reliable Travel Speeds:** During construction, the number and length of the lane closures required of this ATC will be reduced and will therefore provide more reliable travel speeds for the public.
- **Enhances Community Value:** The alternative methods proposed in this ATC will reduce the amount of asphalt or concrete needed to reconstruct the roadway. This in turn will reduce truck traffic to and from the Project site. Reducing the number of trucks traveling throughout the corridor will improve localized congestion.

## 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. By allowing KMP to select the proposed high-performance reconstruction alternative, pavement performance will be improved by eliminating the settling and moisture equilibration inherent with methods that disturb the pavement foundation. Furthermore, this ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** This ATC will result in decreased asphalt and concrete quantities, which will reduce trucking required to transport materials to and from the plant. This reduction in trucking will minimize Project emissions.
- **Neighborhood Impacts:** Decreasing localized construction durations and traffic will minimize impacts to the local neighborhoods.

## 5. Cost and Benefits Analysis

The ability to implement this alternative reconstruction method will reduce both construction and O&M costs. KMP is currently analyzing the potential cost benefits. Preliminary analysis indicates a cost savings to the Project, but quantification will be realized as these methods are developed for the various locations where this concept can be applied.

## 6. Schedule Analysis

By adopting the proposed alternative for reconstruction, the overall project schedule can be accelerated, and potentially help to achieve an earlier completion for this segment. KMP is still analyzing the potential schedule benefits but anticipates a schedule savings between one to two months for this segment.

## 7. Conceptual Drawings

**Attachment A:** Tracked changes to Schedule 10 Section 9 of the PA

## 8. Past Use

The approach proposed herein is routinely used by CDOT and other owner-agencies worldwide as a prudent means to design and construct a long-life pavement. Utilizing the existing pavement structure, and engineering a new long-life pavement is realized through proper

consideration of the design inputs, and also by providing details that mitigate potential issues that may arise, such as reflective cracking.

## 9. Additional Information

N/A

## C. Detailed ATC Requirements

### 1. Risks

Risks to the Procuring Authorities and CDOT are reduced with implementation of this ATC. By leaving the existing pavement section in place, numerous pavement performance risk factors are mitigated, largely associated with disturbance of the pavement foundation associated with a full reconstruction event.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with implementation of this ATC.

### 3. Right-of-Way

No additional right-of-way is expected to be required to implement this ATC.

### 4. List of Required Approvals

No new approvals are expected to be required to implement this ATC

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for the exclusive use by KMP upon acceptance of this ATC.

1. Section 9.4.1.d of Schedule 10 of the PA
2. Section 9.4.1.d.i of Schedule 10 of the PA
3. Section 9.4.2.d.i of Schedule 10 of the PA

#### b) Proposed Revisions to address Inconsistencies

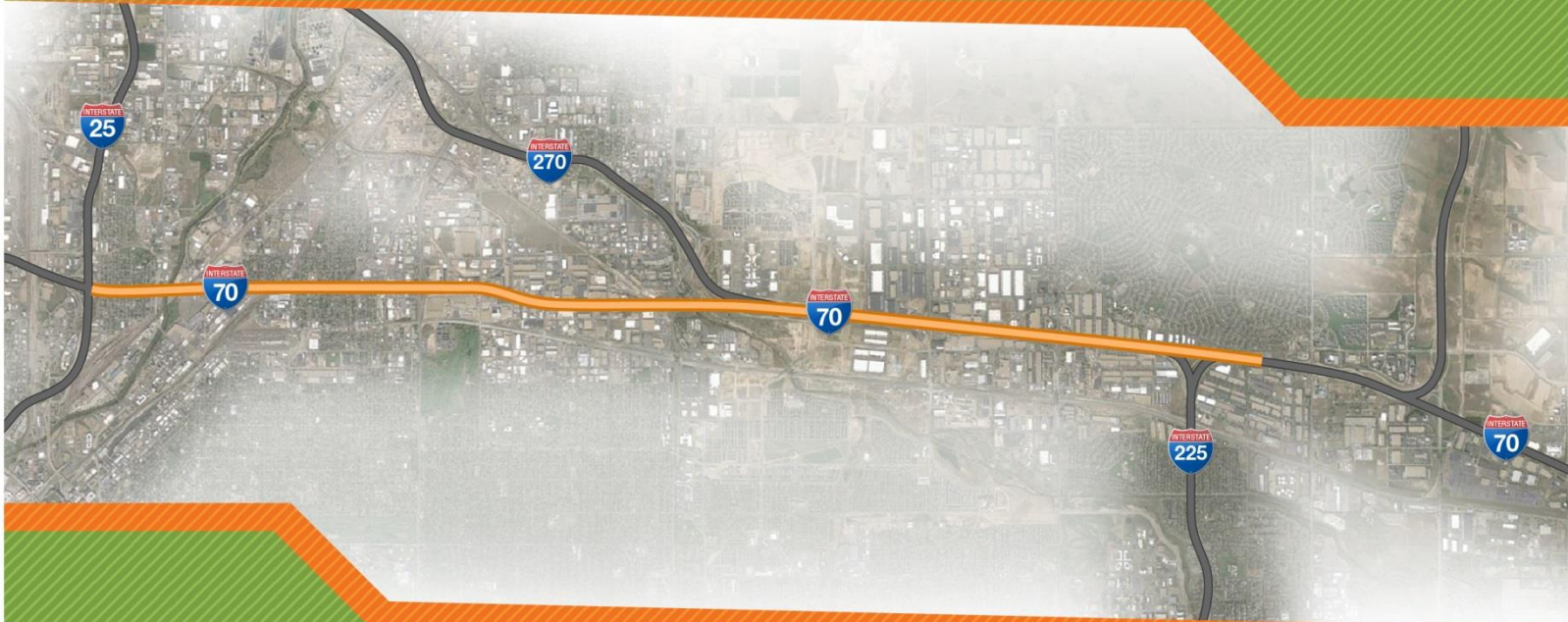
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 9 of Schedule 10

ATC 43.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016



- E. Provide an outside shoulder width meeting the design criteria specified in this Section 9.
  - c. Brighton Boulevard to Colorado Boulevard: Full Reconstruction of Highway Below Grade
    - i. The I-70 Mainline shall be reconstructed to provide three General Purpose Lanes and two Ultimate Tolloed Express Lanes with associated ITS infrastructure in each direction. The Developer is required to construct one Tolloed Express Lane with the accommodation for one additional future Tolloed Express Lane. The Developer is responsible for delineating and striping one Tolloed Express Lane, with weave zones, in each direction as part of the Construction Work.
    - ii. The I-70 Mainline shall be reconstructed to meet the following requirements:
      - A. Provide an inside shoulder (width to include a future Ultimate second Tolloed Express Lane with inside shoulder);
      - B. Provide a single Tolloed Express Lane, adjacent to the General Purpose Lanes;
      - C. Provide a buffer between Tolloed Express Lane and adjacent General Purpose Lanes;
      - D. Provide three General Purpose Lanes; and
      - E. Provide an outside shoulder meeting the design criteria specified in this Section 9.
    - iii. The Developer shall provide ramp acceleration and deceleration lanes, including continuous auxiliary lanes in both directions: between the Brighton Boulevard and Colorado Boulevard interchanges in the eastbound direction, and between Brighton Boulevard and Steele Street/Vasquez Boulevard in the westbound direction.
  - d. Colorado Boulevard to Sand Creek Bridge: ~~Full~~ Reconstruction of Highway on alignment
    - i. The I-70 Mainline shall be reconstructed to provide three General Purpose Lanes and two Ultimate Tolloed Express Lanes with associated ITS infrastructure in each direction, extending ~~full~~-reconstruction of the I-70 Mainline to the west side of the existing Sand Creek bridge. The Developer is required to construct one Tolloed Express Lane with accommodation for one additional future Tolloed Express Lane. The Developer is responsible for delineating and striping one Tolloed Express Lane, with weave zones, in each direction as part of the Construction Work.
    - ii. The I-70 Mainline shall be reconstructed to meet the following requirements:
      - A. Provide an inside shoulder (width to include a future Ultimate second Tolloed Express Lane with inside shoulder);
      - B. Provide a single Tolloed Express Lane, adjacent to the General Purpose Lanes;
      - C. Provide a buffer between Tolloed Express Lane and adjacent General Purpose Lanes;
      - D. Provide three General Purpose Lanes; and
      - E. Provide an outside shoulder meeting the design criteria specified in this Section 9.

general limits of the roadways' reconstruction. Sidewalks shall be provided on both sides of Steele Street/Vasquez Boulevard and Colorado Boulevard for the length of the new roadway construction.

c. Holly Street and Interchange Ramp Construction

- i. The Developer shall remove and replace the existing I-70 slip ramps located at Dahlia Street and Monaco Street with a new diamond interchange at Holly Street. The new Holly Street interchange shall be developed to allow the I-70 Mainline to pass over Holly Street. Ramp connectivity from Holly Street/Stapleton Drive to the I-70 Mainline shall be provided as eastbound exit, westbound entrance, westbound exit, and eastbound entrance ramps in accordance with the following requirements:
  - A. Diverging from Stapleton Drive North, the Holly Street westbound entrance ramp shall have a two-lane ramp tapering to a single-lane entrance and acceleration lane including a physical barrier (i.e. roadside barrier or median) to prohibit vehicles from local intersecting streets (Glencoe Street) from entering the westbound entrance ramp to I-70;
  - B. The Holly Street eastbound exit ramp shall have a single-lane ramp with single-lane exit and deceleration lane merging with Stapleton Drive South with connection to Holly Street that includes a left/thru, two thru lanes, and a right turn lane;
  - C. The Holly Street westbound exit ramp shall have a single-lane ramp with single-lane exit and deceleration lane merging with Stapleton Drive North with connection to Holly Street that includes a left turn lane, two thru lanes, and a right turn lane; and
  - D. Diverging from Stapleton Drive South, the Holly Street eastbound entrance ramp shall have a two-lane ramp tapering to a single-lane entrance and acceleration lane.
- ii. Dedicated right-turn lanes shall be provided from northbound and southbound Holly Street to Stapleton Drive, and from eastbound and westbound Stapleton Drive to Holly Street.
- iii. Reconstruction of Holly Street at the I-70 Mainline shall include, at a minimum, one thru lane each direction and dual left-turn lanes northbound and southbound to Stapleton Drive, plus one bike lane in each direction. A minimum of 110 feet of left-turn storage shall be provided northbound and southbound approaching Stapleton Drive. Provide a minimum of 250 feet of dual thru-lane capacity for the northbound direction of Holly Street, approaching Stapleton Drive South. The extent of Construction Work on Holly Street shall be as necessary to accommodate the required lane capacity and tapers including the removal of on-street parking per Section 9.4.14. Sidewalks shall be provided on both sides of Holly Street for the length of the new roadway construction.

d. Quebec Street and Interchange Ramp Reconstruction

- i. ~~Full-r~~ Reconstruction of the I-70 Mainline shall extend to the existing Sand Creek Bridge. Ramp connectivity from Quebec Street to I-70 shall be provided as westbound entrance, eastbound exit, westbound exit, and eastbound entrance ramps.
- ii. The Developer shall provide new I-70 ramp connections for the westbound entrance and eastbound exit ramps in accordance with the following requirements:

The Quebec Street westbound entrance ramp shall have a two receiving lane ramp connection with a two-lane ramp combined with an entrance



DATE: August 31, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 47.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 47.0 has been reviewed by the Procuring Authorities.

Detailed ATC 47.0 proposes to reuse existing drainage infrastructure which includes cross drains, storm drains, inlets, manholes, headwalls and wingwalls, riprap, embankment protectors, detention pond features, and other appurtenances.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Conditions of approval:

- 1. KMP shall submit each location where drainage infrastructure is being proposed for reuse for Approval by the Procuring Authorities.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



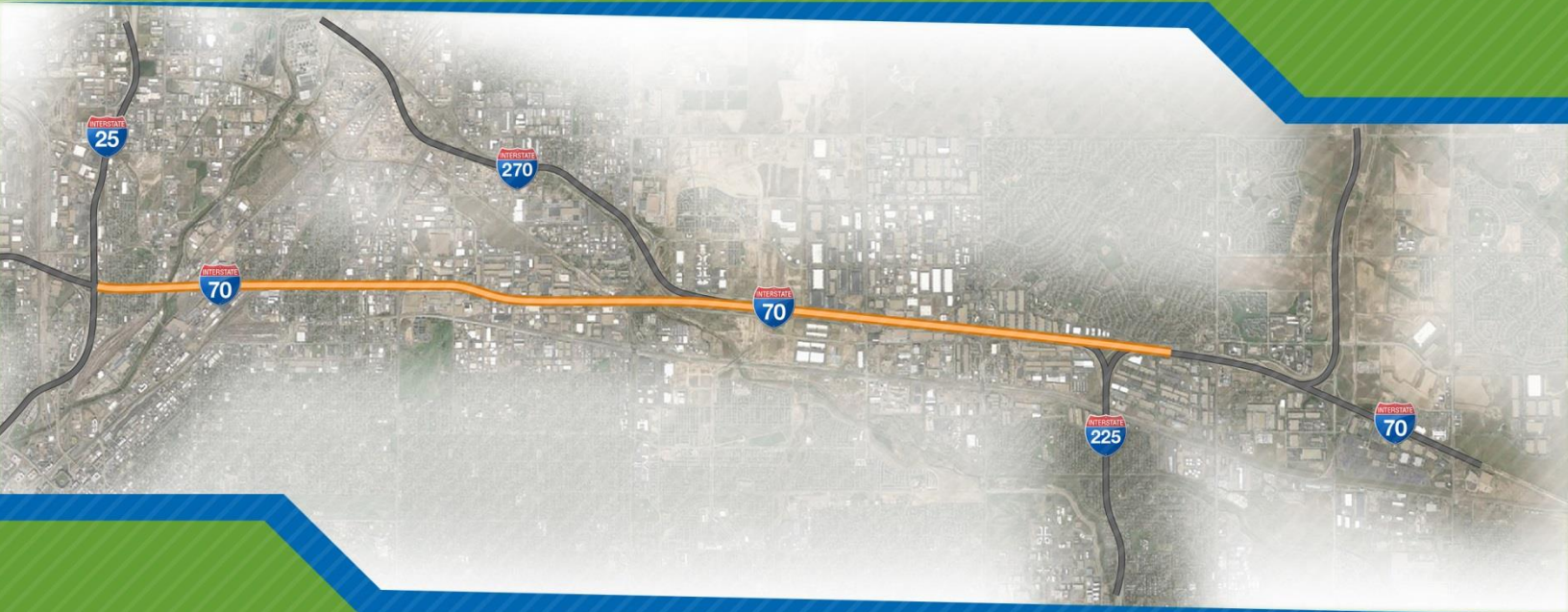




# Central 70 Project

Alternative Technical Concept Submission

ATC 47.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** July 14, 2016

**Central 70 Project RFP: ATC Submission No. 47.0**

**Reuse of Existing Drainage Infrastructure**

### Background Information

1. Type of Submission

Conceptual ATC

Detailed ATC

*KMP has prepared this ATC as a Detailed Submission with no previous Conceptual Submission for the efficiency of all parties. This ATC meets all requirements of a Detailed Submission and no further information is anticipated.*

2. Prior Submission

None (initial submission of ATC)

Previously Submitted as Conceptual ATC

Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Not Applicable

4. Request for Discussion at One-on-One Meeting

Meeting Requested

Meeting Not Requested

### ATC 47.0 Benefits

- ✓ Optimizes Scope and Lowers cost
- ✓ Reduced storm drainage replacements
- ✓ Enhances community values and project benefits
- ✓ Comprehensive Stormwater management
- ✓ Shorter schedule duration

## B. General ATC Submission Requirements

### 1. Overview Description

Kiewit-Meridiam Partners (KMP) is proposing to optimize Project scope through the reuse existing drainage infrastructure which includes cross drains, storm drains, inlets, manholes, headwalls and wingwalls, riprap, embankment protectors, detention pond features, and other appurtenances. This ATC is only proposing to reuse existing features that are functional, in good condition, have adequate remaining design life, meet all design criteria, and will continue to meet these same requirements after the Project is constructed.

### 2. Relevant RFP Requirements

Schedule 10, Section 8.4.4.a, Paragraph (ii) of the Project Agreement states the following:

*Existing Cross Drains, Storm Drains, embankment protectors and drainage appurtenances between Brighton Boulevard and Sand Creek shall be removed in their entirety and replaced with drainage features designed for the project. The limits of removal shall be limited to I-70*

*Mainline, CDOT Roadways, 46<sup>th</sup> Avenue North, 46<sup>th</sup> Avenue South, Stapleton Drive North and Stapleton Drive South.*

### 3. Rationale

KMP acknowledges that much of the Project has aging drainage infrastructure that is in need of replacement in order to meet current design criteria and/or the required design life. However, there is potential to reuse infrastructure that is determined, through good engineering analysis, to be in good condition with adequate remaining design life. Additionally, there are several locations where drainage infrastructure has been recently replaced including the Quebec Street interchange and the I-70 Bridge over Sand Creek.

This ATC will allow KMP the flexibility to use good engineering judgement to determine the drainage infrastructure throughout the corridor that can be reused. In order to meet performance and life cycle criteria, other alternatives besides full replacement will be considered to extend the design life, such as repairs, partial replacement, or in-situ lining. This is consistent with guidance and recommendations in the CDOT Drainage Design Manual. Preliminary analysis indicates that existing drainage infrastructure can potentially be reused or retrofitted at the locations listed on **Attachment A**. Throughout the design process, KMP will continue to review and modify this list.

This ATC directly aligns with the following Project Goals:

- **Optimization of Scope:** Through good engineering judgement, this ATC will eliminate the need for large storm drain and cross drain replacements and therefore reduce overall Project cost.
- **Optimize Life Cycle Maintenance Costs:** By reusing drainage facilities, this ATC can take advantage of the remaining life cycle of existing drainage facilities and maximize the return on investment previously expended by CDOT and other municipalities.
- **Utilize a collaborative process to enhance Project benefits:** This ATC incorporates the benefits of recently constructed projects, some of which included funding participation from local municipalities, to produce an efficient and comprehensive design.

### 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. KMP will ensure that all relevant criteria will be met for any existing drainage facilities identified for reuse. Existing cross drain, storm drain, and other appurtenances will be evaluated on a case-by-case basis to determine whether they can be left in place and reused. The evaluation process will include the following analyses:

- **Current Condition/Remaining Design Life:** An in-depth analysis will be performed to ensure the drainage facilities meet current design standards and criteria
- **Final Design:** The exiting drainage facilities will be analyzed to ensure they can be incorporated into the final design, i.e. capacity, grades, locations, etc.

This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** This ATC is in alignment with CDOT's Sustainability Program. Within this program, CDOT strives to reduce emissions, waste, energy use,

and water consumption, while also maximizing efficient resource use, reuse, recycling, and repurposing.

- **Neighborhood impacts:** Temporary impacts to local side streets such as Forest Street, Grape Street, Oneida Street and Airlawn Road could potentially be reduced by not having to replace large storm sewers within these streets. The replacement of the storm sewers would require temporary lane closures and significant excavations within the street section to remove and replace the sewers.
- **Historic Flows:** Continued use of existing drainage infrastructure will assist in ensuring historical flow patterns are maintained.

## 5. Cost and Benefits Analysis

The reuse of existing infrastructure eliminates a significant amount new construction, as well as the savings of removal and disposal of the existing features, including associated earthwork and pavements.

**Initial cost analysis indicates an overall savings to the Project of up to \$225,000.**

## 6. Schedule Analysis

While localized construction durations will potentially be reduced, initial schedule analysis indicates no significant schedule savings to the overall Project.

## 7. Conceptual Drawings

**Attachment A:** tracked changes to Schedule 10, Section 8.4.4.a, Paragraph (ii) of the PA

## 8. Past Use

Reuse of existing drainage infrastructure is standard practice within the industry and on CDOT projects. Chapter 5 (Planning and Location) of the CDOT Drainage Design Manual, Section 5.3.3 states, in part:

*The following evaluations should be made when selecting the plan for disposal of stormwater runoff:*

- *Assess the capacity/adequacy of existing drainage systems.*

## 9. Additional Information

N/A

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State, or third parties associated with implementation of the ATC. KMP plans evaluate storm drains and cross drains on a case-by-case basis to mitigate any short term and long term risks through prudent engineering and construction practices.

### 2. Handback

There are no changes in Handback procedures and/or the Handback Requirements associated with this ATC. At handback, the Department will receive storm sewers and manholes which will

have a residual life of 40 years, and end treatments (headwalls, wingwalls, and riprap) with a residual life of 25 years. Part of the case-by-case evaluation will be assessment of remaining design life, and whether the existing infrastructure to be left in place will meet the required handback requirements.

### 3. Right-of-Way

No additional right-of-way is required to implement this ATC.

### 4. List of Required Approvals

No other approvals outside the Department are required for this concept.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10, Section 8.4.4.a, Paragraph (ii) of the PA

#### b) Proposed Revisions to address Inconsistencies

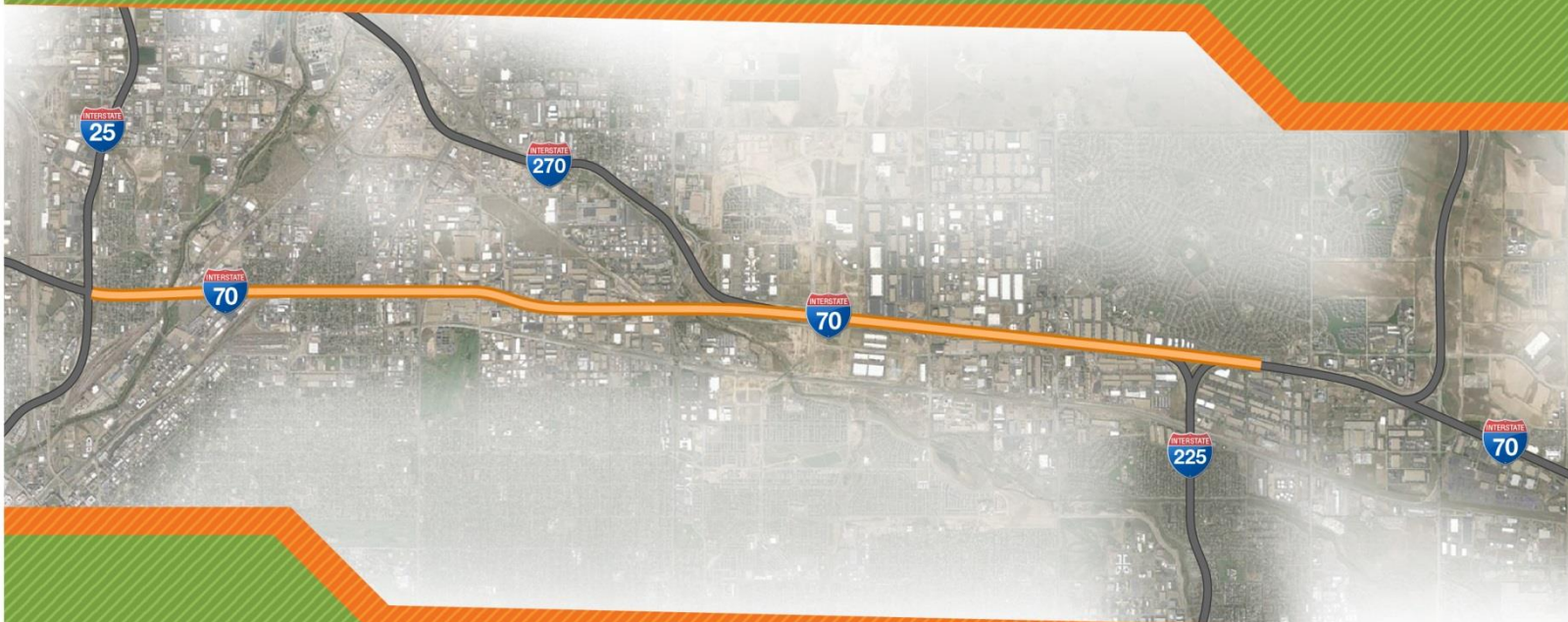
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 8 of Schedule 10

ATC 47.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

July 14, 2016



- (I) For roadside ditches along all existing and proposed roadways, the water surface profile shall have a minimum of one foot of freeboard for the 10 year return frequency peak discharge and shall not exceed edge of pavement for the 100 year return frequency peak discharge;
- (II) All open channels within the Site shall be designed to capture and convey the 100 year return frequency with a minimum one foot of freeboard. Capacity shall be determined using manning's equation;
- (III) All ditches and open channels with a grade exceeding two percent shall be constructed with a turf reinforcement mat or other means. Concrete or asphalt lining shall be considered in areas determined by the Developer as difficult to maintain regardless of slope or capacity; and
- (IV) Flexible channel linings shall be designed in accordance with Federal Highway Administration (FHWA) *HEC-15, Design of Roadside Channels with Flexible Linings*. Riprap channel lining shall be designed in accordance with FHWA *HEC-23, Bridge Scour and Stream Instability Countermeasures*.

ii. Removals and Abandonments

Existing Cross Drains, Storm Drains, embankment protectors and drainage appurtenances between Brighton Boulevard and Sand Creek shall be evaluated for condition, capacity, and adequacy. Existing features that do not meet design criteria per the CDOT Drainage Design Manual, or that are in such condition that they will not continue to be functional throughout the Operating Period or meet Handback requirements as noted in Schedule 12, shall be removed in their entirety and replaced with drainage features designed for the Project. The limits of removal shall be limited to I-70 Mainline, CDOT Roadways, 46<sup>th</sup> Avenue North, 46<sup>th</sup> Avenue South, Stapleton Drive North and Stapleton Drive South.

Drains abandoned by the Developer outside the aforementioned removal limits shall be plugged and flow filled per CDOT Standard Specifications and submitted to the Department for Approval prior to abandonment.

The Developer shall:

- A. Maintain historic flow patterns; and
- B. Design and construct for the Ultimate design, as described in the Section.

iii. Cross Drains

- A. Cross Drains are pipes or culverts that convey water from one side of the road to the other without interruption. Pipes connected to manholes or inlets placed in line with a Cross Drain will be referred to as a Storm Drain for the purposes of the Project Agreement. Unintended detention storage shall not be used to reduce the size of a Cross Drain;
- B. Horizontal and vertical alignment of Cross Drains shall be straight with no grade breaks or bends;
- C. The Cross Drain system shall be designed to not worsen the existing conditions for properties outside the Site. The Developer shall provide positive drainage to Cross Drain locations;
- D. The use of sag pipes or inverted siphons shall not be allowed to convey stormwater;



DATE: October 18, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 56.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 56.0 was reviewed by the Procuring Authorities prior to the September One-on-One Meetings and an initial response was sent to you on September 23, 2016. As discussed during the September One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 56.0 proposes to allow consideration of alternate material types for all cable management systems (CMS).

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Following our discussions at the September One-on-One Meeting, the Procuring Authorities have changed their initial response to your above mentioned Detailed ATC Submission. The ATC is approved with the following conditions:

Conditions of approval:

- 1. Galvanized rigid steel shall NOT be used for the CMS.
- 2. The use of phenolic fiberglass for the CMS is approved.
- 3. The Procuring Authorities will be clarifying the RFP regarding our intent of the term "fixings".



The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



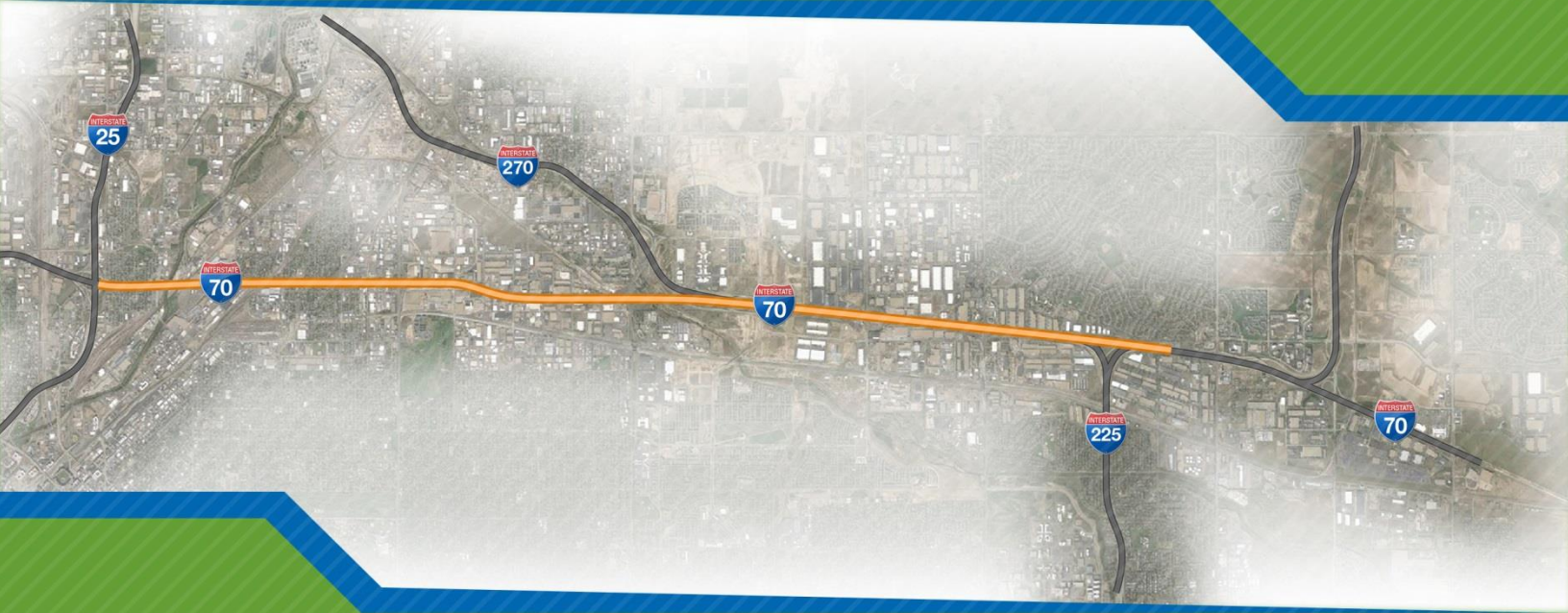




# Central 70 Project

Alternative Technical Concept Submission

ATC 56.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** September 15, 2016

**Central 70 Project RFP: ATC Submission No. 56.0**

**Alternate Materials for Cover CMS**

### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

Kiewit-Meridiam Partners (KMP) has reviewed the Project requirements from a Performance-Based Practical Design (Practical Design) perspective to identify potential cost saving solutions that align with the Project Goals. Through the Practical Design analysis, KMP has identified and developed this ATC to allow consideration of alternate material types for all cable management systems (CMS). The Project Agreement prescribes stainless steel for the CMS in specific locations. This ATC proposes an equal or better solution which allows consideration of nonmetallic phenolic fiberglass or galvanized rigid steel for the CMS. All embedded unistrut will remain Stainless Steel as well as all nuts and bolts. Type 304 stainless steel will be used per CDOT Standard and exposed unistrut will be hot dipped galvanized after fabrication.

Both of the alternate material types will produce significant cost savings to the Project through the reduction in material cost. However, due to its demonstrated safety performance, the preferred material type is phenolic fiberglass. Phenolic fiberglass meets UL 2196 requirements and has been shown to withstand fire at 1800 degrees Fahrenheit for two hours. Additionally, phenolic fiberglass allows for more flexible and efficient design solutions and simplifies installation due to its lightweight properties.

#### ATC 56.0 Benefits

- ✓ Improved fire performance
- ✓ Equal or better performance and reliability
- ✓ Optimized scope
- ✓ Potential cost savings of up to \$6.1mil



## 2. Relevant RFP Requirements

The Project Agreement prescribes the use of 316L stainless steel for the CMS in Section 12.3.2 and 12.16.7.b. of Schedule 10 in specific locations such as the “*cornice on each side of the roadway and on the soffit on the centerline of the roadway*”.

This ATC also seeks to clarify the requirements of Section 12.5.2 of Schedule 10 which states:

*“All fixings shall be Grade 316L stainless steel, with a grade appropriate to the environmental conditions in the Cover and the design life of a particular item of equipment to be supported.”*

KMP is proposing to install all light fixtures and devices as cast aluminum with protective coating applied by the manufacturer. The intent of Section 12.5.2 is unclear as “fixings” is not recognized as an industry term. If the intent of Section 12.5.2 is for all lighting fixtures to be Grade 316L stainless steel, this will add up to \$1,750,000 to the overall Project cost. Additionally, through initial reviews, the specified product does not appear to be manufactured in the United States.

## 3. Rationale

Section 12.3.1 of Schedule 10 requires components to be durable and meet specific requirements. KMP can meet or exceed these requirements through the use of alternative materials for CMS while producing significant cost savings for the Project. Specifically, in place of stainless steel, KMP proposes the use of either galvanized rigid steel or phenolic fiberglass to provide:

- protection against the temperature produced by the design fire;
- resistance to mold growth attack by vermin or other life forms; and
- a minimum design life of 20 years.

Due to its strength and longevity, galvanized rigid steel has traditionally been the preferred material used to support ventilation fans, lights, and CMS. In 2012, UL, a global independent safety science company, dropped the safety listings of galvanized rigid steel conduit due to its susceptibility to failure when exposed to fire. Since then, DOTs throughout the country have been making the gradual shift to stainless steel because of its performance in fire and corrosion resistance. However, the material costs of stainless steel can be up to ten times the amount for galvanized rigid steel.

Galvanized rigid steel can still be effectively used in the Cover through prudent engineering practices. The use of an effective fixed firefighting system, and other fire protection features, will mitigate the risk of material failure in the event of a fire. To meet the atmospheric corrosion requirements, installation of galvanized rigid steel will not be used in areas where there is high potential for exposure to saline atmospheres. Specifically, high risk for saline atmospheres will be caused by salt laden road spray applied at the entrance of each portal. To mitigate this risk, galvanized rigid steel will not be used within 10 ft. vertically from the top of pavement or within 25 ft. horizontally of the entrance of each portal.

While galvanized rigid steel can be safely and effectively used, KMP recognizes that the Department may not be interested in its use given the recent industry trend. However, phenolic fiberglass provides an alternative to both stainless steel and galvanized rigid steel which has proven to be successful on other tunnels throughout the country. While being cost-effective and

easier to install, it is inert to corrosion and will withstand temperatures of 1800 degrees Fahrenheit for over 2 hours. Phenolic fiberglass is an equal, and in certain instances a better, solution to stainless steel.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** KMP's first priority is the safety of the workforce and the public. This ATC would not be pursued if it did not provide equivalent levels of safety to the public in the event of a fire. Additionally, phenolic fiberglass will withstand fire at 1800 degrees Fahrenheit for two hours. The lighter weight material will also produce a safer construction environment for the workforce.
- **Optimization of Scope:** This ATC optimizes the scope by using alternate materials which provide equal or better performance to that specified by the Project Agreement.
- **Optimization of the Life Cycle Maintenance Costs:** Galvanized rigid steel and phenolic fiberglass both offer superior long term life-cycle performance. Galvanized rigid steel has been known to have a service life of more than 60 years with the equipment typically becoming obsolete and requiring replacement before the galvanized rigid steel itself.
- **Minimize impacts:** The lightweight properties of a phenolic fiberglass CMS will result in more efficient construction. This will help limit the duration of impact during construction and for any future repairs, upgrades, or maintenance activities.

## 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts.

## 5. Cost and Benefits Analysis

This ATC will reduce Project cost through more efficient material selection. **The total cost savings depending on the material selection, or combination thereof, and use of aluminum light fixtures could potentially be up to \$6,100,000.**

## 6. Schedule Analysis

While localized construction durations will potentially be reduced, initial schedule analysis indicates no significant schedule savings to the overall Project.

## 7. Conceptual Drawings

N/A

## 8. Past Use

Galvanized rigid steel has been used traditionally on tunnels throughout the country. The recent trend has been to utilize alternate materials; however, there is still a long history of successful application.

On the Midtown Tunnel Project in Norfolk, Virginia, KMP team members, Kiewit and Parsons Brinckerhoff, gained approval from the AHJ to use phenolic fiberglass conduits and fittings throughout the tunnel. Phenolic fiberglass proved to be much lighter than stainless steel and



therefore required less labor and supporting framing to install. The Virginia Department of Transportation allowed the use of phenolic fiberglass because it is resistant to corrosion and provides the equivalent mechanical strength as stainless conduit.

## 9. Additional Information

N/A

### C. Detailed ATC Requirements

#### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

#### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

#### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

#### 4. List of Required Approvals

No change in the approvals is required to implement this ATC.

#### 5. Proposed Drafting Revisions

a) RFP Requirements that are Inconsistent with Proposed ATC

This ATC will require change to the following RFP requirements:

b) Schedule 10 Section 12.3.2; and

c) Schedule 10 Section 12.5.2

d) Proposed Revisions to address Inconsistencies

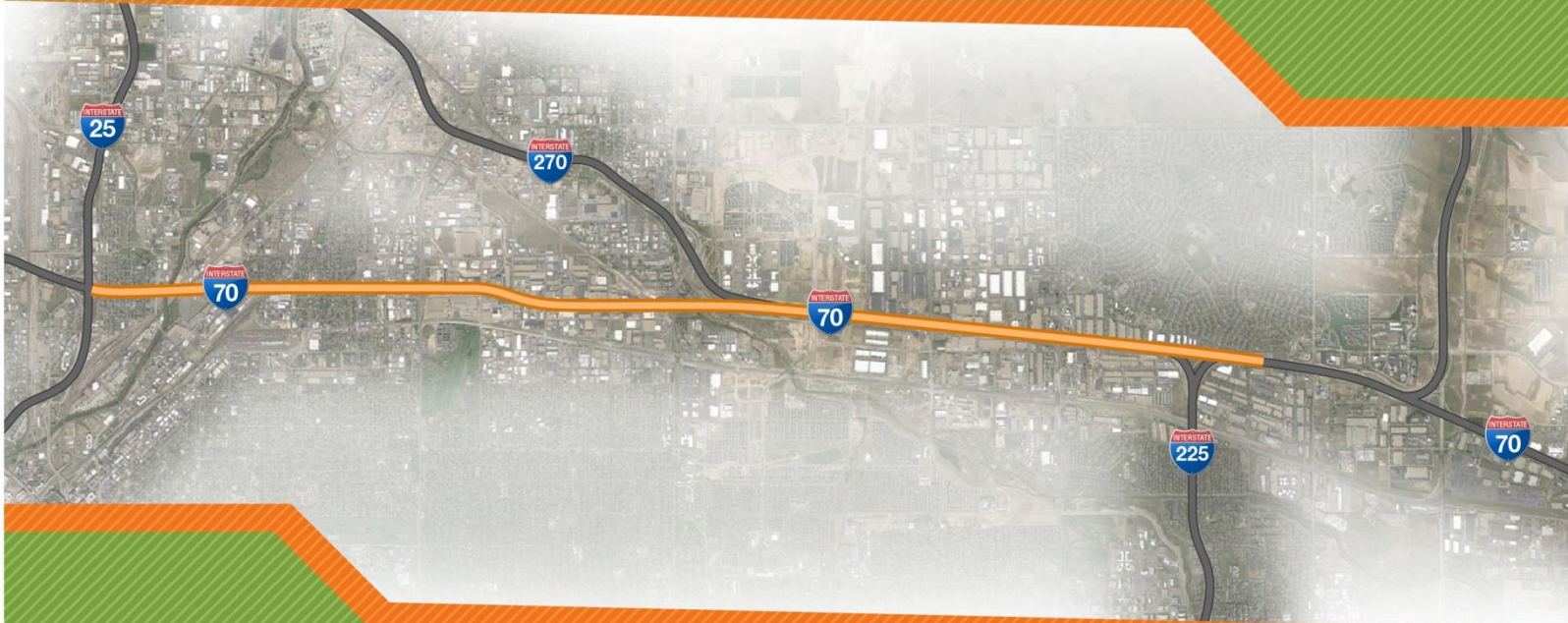
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 12 of Schedule 10

ATC 56.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

September 15, 2016



- 12.1.1. All equipment mounted in the Cover shall be mounted in such a way that it meets all design standards both in normal and Emergency use. This shall include measures such as mounting equipment outside of vertical clearance requirements on the Cover walls adjacent to I-70 Mainline or recessing all low-level equipment to not protrude into the horizontal clearance requirements.
- 12.1.2. The Developer shall provide emergency exit doors near each entry Portal to each bore and at a minimum one additional emergency exit door located within the Cover (spaced equally), which exit doors shall be for Fire Department use and meet the requirements of the National Fire Protection Association (NFPA) standard 502 subsection 716.5 and the subject requirements provided herein.

## **12.2. Applicable Standards**

- 12.2.1. The Cover MEP System shall be designed to comply with the Construction Standards. The requirements of the NFPA standard 502 and associated standards and specifications apply to the Cover and the Lowered Section on the approaches to the Cover. The Construction Work for the Cover is classified as *Category C* for fire protection and fire life safety purposes.
- 12.2.2. The requirements of the NFPA standard 502 and associated standards and specifications apply to the entire length of the Lowered Section, the limits being between Brighton Blvd. and Dahlia Street.
- 12.2.3. The Developer shall design, install, test, commission and put into operation the Cover MEP System in accordance with the Construction Standards and the requirements specified in this Section 12. The extent of the Cover MEP System shall include the whole of the Cover (including I-70 Mainline, Portals etc.), immediate approaches, all associated plant/equipment rooms and spaces, yards, interconnecting spaces (including pipes, ducts, cabling etc.), local and remote control centers etc., unless stated otherwise.

## **12.3. Durability**

- 12.3.1. All equipment used in the Cover MEP System shall be protected against temperature range and atmospheric corrosion, including saline atmospheres. Materials used shall not be susceptible to mold growth, or attack by vermin or other life forms. All components shall have a minimum design life of 20 years.
- 12.3.2. All cable management systems (CMS) i.e. trunking, trays, conduit, brackets, enclosures etc. for equipment and ancillary items inside the bores of the Cover (including on the Portals and on the cross bore escape doors) shall be manufactured from grade 316L stainless steel, [galvanized steel or nonmetallic phenolic resin](#). [Stainless steel components shall be required only for the western 25 feet measured from the west portal over the eastbound lanes of I-70 and the eastern 25 feet measured from the east portal over the westbound lanes of I-70.](#)
- 12.3.3. Enclosures shall have minimum penetration protection rating to withstand sustained water jetting at a pressure of 1450 psi (10 MN/m<sup>2</sup>) for a period of 15 minutes without penetration of water or loss of surface finish, together with resistance to dust ingress.
- 12.3.4. Enclosures shall have a high impact resistance. Durable finishes shall be provided to all materials to resist mechanical stress due to moisture, traffic exhaust fumes, Cover washers brush, cleaning detergents, etc.
- 12.3.5. Enclosures shall be designed to be free draining so that water does not 'pond' on any surfaces.

## **12.4. Pipework**

- 12.4.1. The Developer shall use pipe work with anchor joints avoiding the use of concrete anchor or thrust blocks. However, additional anchoring or restraint shall be provided to the pipe work where required. The Developer shall consider the effects of surge within the fire and water distribution systems and shall provide a surge suppression system or devices to counter the effects of surge.
- 12.4.2. The water and fire mains shall be adequately insulated and trace heated where subject to freezing. The mains passing through the Cover shall be insulated and trace heated. Trace heating shall be monitored on the Developer's Command Control and Monitoring System (CCMS). Fire suppression distribution mains shall be insulated and trace heated up to the section control valve as directed by

the system provider. Domestic water services within plant rooms shall be insulated and trace heated. Insulation shall be fire resistant and smoke retardant.



- 12.4.3. Pipework shall have electrical earth bonding.
- 12.4.4. Section isolation valves shall be provided at suitable locations and spacing along the Cover to facilitate inspection and maintenance Activities and automatic air release and drain valves shall be provided where necessary. These valves shall be monitored on the CCMS.

### **12.5. Fixtures**

- 12.5.1. No fixture shall be made within two inches of the edge of a transverse movement joint in the Cover structure.
- 12.5.2. All ~~fixings~~ fixtures shall be cast aluminum with a protective coating applied by the manufacturer with a grade appropriate to the environmental conditions in the Cover and the design life of a particular item of equipment to be supported. ~~Grade 316L stainless steel.~~
- 12.5.3. All fixings shall be designed to withstand a temperature of 842°F for a minimum period of one hour without loss of their design load carrying capacity. All fixings for equipment shall be designed so as to not overstress, damage or affect the performance or life of the structural fire protection system.

### **12.6. Electromagnetic Environment**

The Developer shall ensure that any electrical and electronic equipment shall not be interfered with by, nor shall interfere with, any communications systems (including public radio and Emergency Services radio).

### **12.7. Cables**

All cables shall be low smoke and fume and shall be suitable for its CMS in a Cover environment. Any cables exposed to daylight shall be ultraviolet resistant.

### **12.8. Training**

The Developer shall provide operator and maintenance personnel training for each system prior to being put into use. This training shall include all aspects of operation, maintenance, configuration and future modification of the installation. The Developer shall provide training to the Department's staff who will be required to operate the I-70 Mainline and Cover MEP System in the event of the Developer's control room being unusable. The Developer shall provide in a suitable electronic format all training material and notes suitable for Department to train staff in the future. The Developer shall also develop suitable operator and maintenance personnel testing regime to ensure that all staff are trained and understand the systems to a competent level.

### **12.9. Special Tools**

The Developer shall provide any special tools required to maintain the equipment, including licenses for any software required to maintain the system.

### **12.10. Cover Reference System**

The Developer shall submit to the Department for Acceptance a common referencing system for the length of the Cover, for identifying position along the I-70 Mainline and for referencing within asset registers. This shall be coordinated with the rest of the I-70 Mainline. This referencing system shall be clearly and indelibly marked within the Cover, using a method Accepted by the Department. The referencing system shall be coordinated with the Emergency response systems to ensure efficient identification of zones within the Cover during an Emergency for the purposes of operator response, system activation and Fire Department information.

### **12.11. Cover Design Baseline Report**

- 12.11.1. The Developer shall submit a Final Cover Design Baseline Report (consistent with the Draft Cover Design Baseline Report submitted with the Proposal) to the Department for Acceptance in accordance with the Project Schedule. The Cover Design Baseline Report shall provide a system description that includes as a minimum the following Elements:



DATE: October 18, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 57.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 57.0 was reviewed by the Procuring Authorities prior to the September One-on-One Meetings and an initial response was sent to you on September 23, 2016. As discussed during the September One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 57.0 proposes to modify the local roadway closure restrictions to allow concurrent closures to Clayton and Columbine St.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).

Following our discussions at the September One-on-One Meeting, the Procuring Authorities have changed their initial response to your above mentioned Detailed ATC Submission. The ATC is approved with the following conditions:

Conditions of approval:

- 1. The Developer shall be required to submit a MOT Variance to the Department for Approval as contemplated by Section 2.3 of Schedule 10 to the Project Agreement at the appropriate time during the Construction Period in order to obtain approval for the implementation of the terms of this ATC. For certainty, the conditional approval of this ATC does not provide any assurance that any such MOT



Variance will be Approved by the Department. However, the Procuring Authorities consider that such conditional approval allows KMP to evaluate the risks associated with the Developer being able to obtain an MOT Variance reflecting the terms of such ATC and therefore whether or not to include this ATC in its Technical Proposal.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



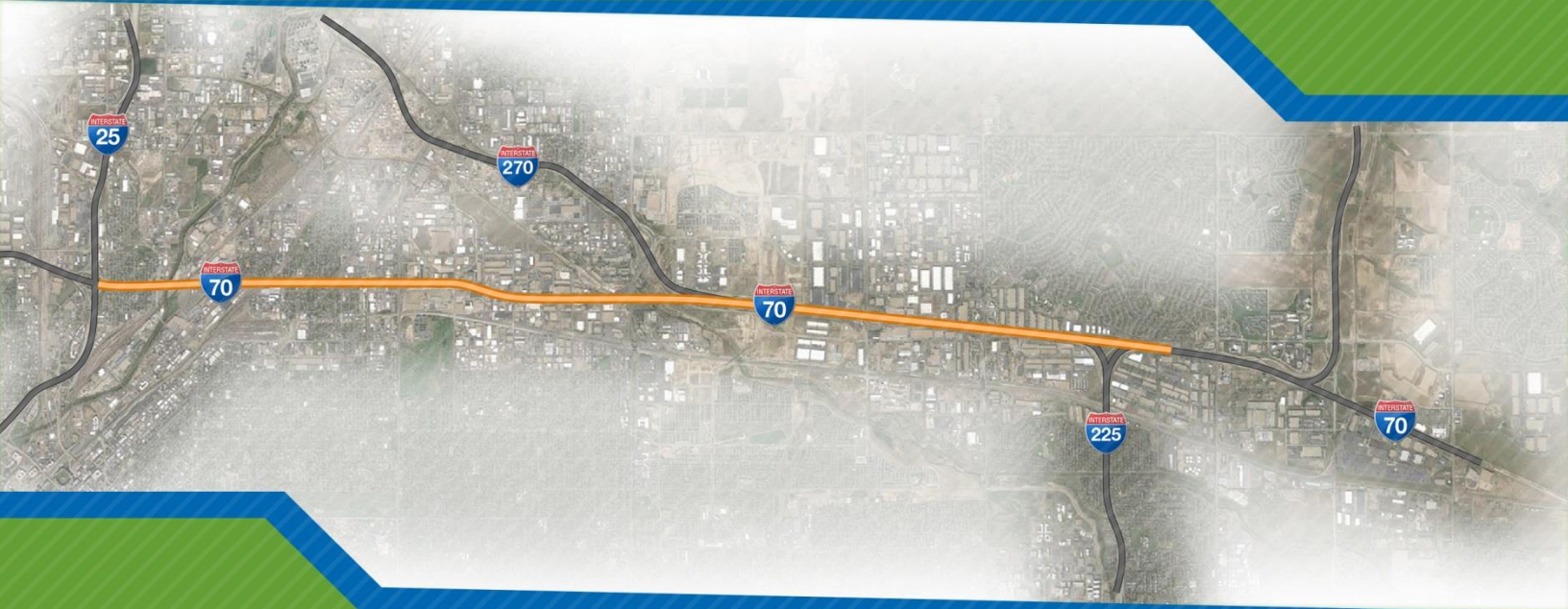




# Central 70 Project

Alternative Technical Concept Submission

ATC 57.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** September 15, 2016

**Central 70 Project RFP: ATC Submission No. 57.0**

### Local Roadway Closure Restrictions

#### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

#### B. General ATC Submission Requirements

##### 1. Overview Description

Kiewit-Meridiam Partners (KMP) has analyzed the Project phasing requirements and developed an optimal phasing solution to minimize impacts to the traveling public and local communities. KMP's optimized phasing solution utilizes concurrent closures of Clayton and Columbine St. to facilitate construction of both cross-streets within one summer season and maintains north-south connectivity using alternate streets. This ATC proposes to modify the local roadway closure restrictions to allow concurrent closures with no adverse impacts to north-south connectivity, RTD Bus Routes, or Swansea Elementary School.

##### 2. Relevent RFP Requirements

This ATC will require modifications to the local roadway closure restrictions prescribed in Table 2-2 of Section 2.11.5 of Schedule 10 of the Project Agreement.

##### 3. Rationale

Table 2-2 of Section 2.11.5 of Schedule 10 of the Project Agreement currently prohibits concurrent closures of Columbine and Clayton St. to accommodate north-south travel throughout construction. Additionally, Section 2.11.7 of Schedule 10 prohibits any bridge construction of Columbine and Clayton St. while Swansea Elementary School is in session. The

### ATC 57.0 Benefits

- ✓ Significant schedule improvement
- ✓ Equal or better performance and reliability
- ✓ Improved public safety from a reduced work duration
- ✓ Reduced traffic and community impacts especially to Swansea Elementary School

intent of this restriction is to avoid pedestrian and vehicular traffic impacts during the school-year. While it is essential to maintain north-south connectivity and limit impacts to the school, the combination of these two restrictions will require construction of Columbine and Clayton St. over two separate summer seasons which will significantly impact the overall Project schedule. KMP recognizes the importance of each of these restrictions and has developed this ATC to meet the full intent of each restriction while providing a more effective work window and decreasing the overall Project schedule.

As presented in the August 8, 2016 IDP Meeting, KMP's phasing solution maintains traffic on the existing viaduct during construction of the westbound lanes in the Lowered Section. Following completion of the westbound lanes, traffic will be diverted to the completed portion of the Lowered Section to allow demolition of the existing viaduct and construction of the eastbound lanes in the Lowered Section. For the traffic to be rerouted, all cross-street bridges, including Clayton and Columbine St., must be complete. Initial schedule analysis indicates that the Clayton and Columbine St. Bridges will each take approximately 2-3 months to construct. Given the current requirements of the Project Agreement, this will force Columbine and Clayton St. to be constructed in two separate summers; thereby, delaying the traffic switch and overall Project schedule.

If concurrent construction is approved, Columbine and Clayton St. will be constructed in a single summer. This will reduce the impacts to the local community by only impacting the north-south connectivity in the area for one season. Additionally, throughout the duration of construction for these two bridges, pedestrian and vehicular access to the school will be maintained. The north-south connectivity will be maintained through use of York St., Josephine St., Elizabeth St., and Thompson Ct. Additionally, the school will still be accessible from Columbine and Clayton St. on the north side of 46<sup>th</sup> Ave. To ensure the RTD Bus Stop at Clayton St. remains operational, adequate improvements for a bus turnaround will be provided.

Prior to concurrent closures of Columbine and Clayton St., KMP will create a north south one-way couplet using Elizabeth St. and Thompson Ct., as shown on **Attachment A**. Elizabeth St. will remain in the existing one-way south configuration between 46<sup>th</sup> and 47<sup>th</sup> Ave. and Thompson Ct. will be reconfigured into a one-way north street between 46<sup>th</sup> and 47<sup>th</sup> Ave. Both streets will connect using existing 46<sup>th</sup> Ave. This proposed closure and alternate configuration will only take place during the summer and access to Swansea Elementary School during school months will be unaffected. This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** This ATC reduces the overall Project schedule and limits the construction of the bridges at Columbine and Clayton St. to one season. This limits the exposure of the Workforce and Public to the inherent risks associated with bridge construction.
- **Minimize Impacts:** Limiting the closure from two summer seasons to one will significantly reduce impacts to Swansea Elementary School and the surrounding community.

## 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts.

## 5. Cost and Benefits Analysis

This ATC will reduce Project cost through more efficient scheduling of the work and an overall shortening of the Project schedule. **Total direct cost savings is minimal; however, the anticipated schedule benefits could produce cost savings of up to \$10,000,000.**

## 6. Schedule Analysis

Preliminary schedule analysis indicates that construction of Columbine and Clayton St. over two summer seasons could significantly impact the critical path of the schedule. While the Project schedule is still under development, **initial schedule analysis indicates that this ATC could potentially shorten the Project schedule by approximately 6 months.**

## 7. Conceptual Drawings

**Attachment A:** Alternate Detour Plan

**Attachment B:** Tracked changes to Section 2 of Schedule 10

## 8. Past Use

Staged closures and combining closures of local streets to streamline construction is a prudent approach used by many urban freeway projects throughout the country. KMP is proposing to apply this practice to the Project to provide significant schedule benefits.

## 9. Additional Information

N/A

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

### 4. List of Required Approvals

No change in the approvals is required to implement this ATC.

### 5. Proposed Drafting Revisions

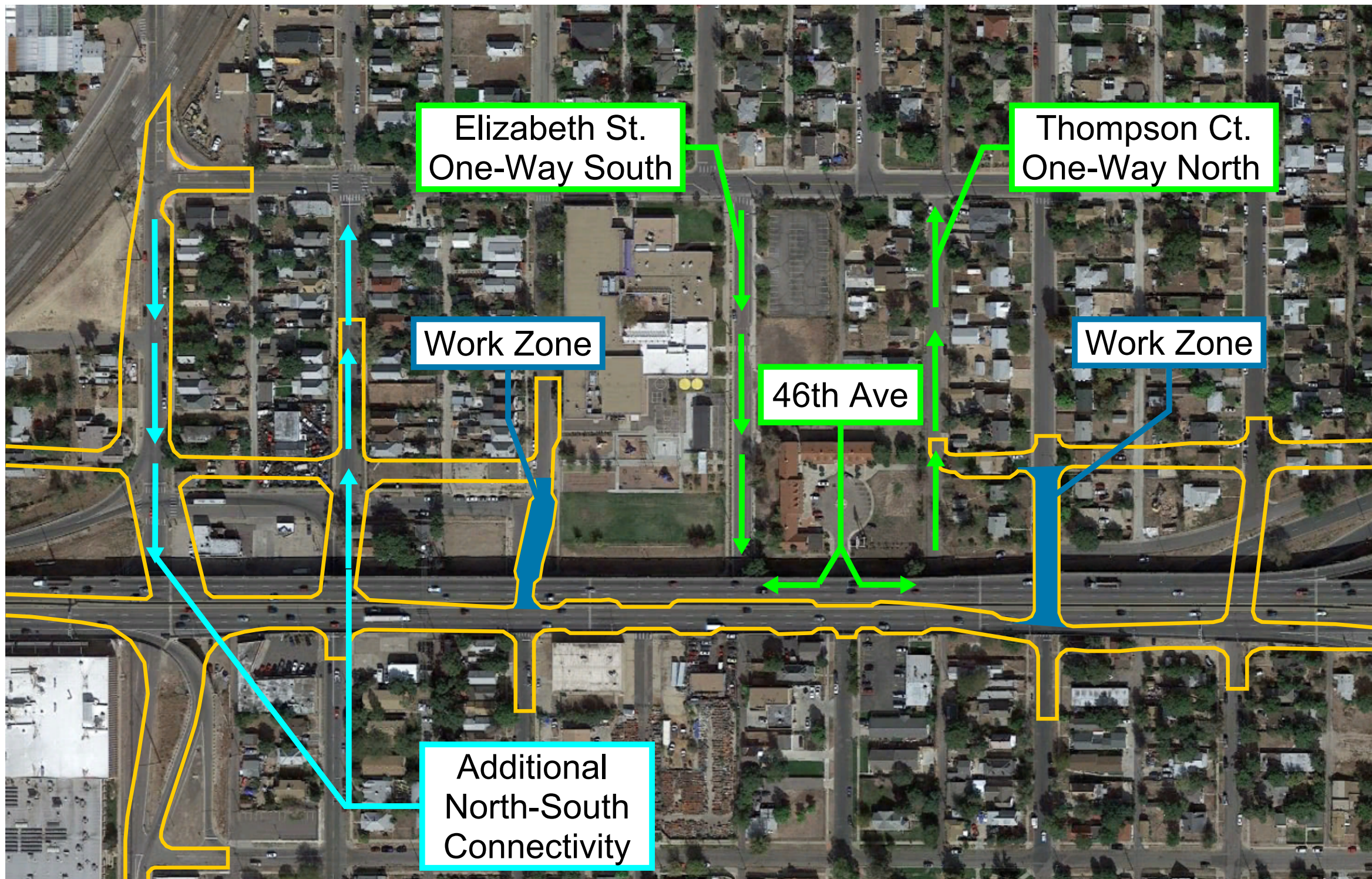
- a) RFP Requirements that are Inconsistent with Proposed ATC

This ATC will require change to Schedule 10 Section 2.11.5, Table 2-2.

b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment B** with tracked changes for the changes in the section listed above.





Elizabeth St.  
One-Way South

Thompson Ct.  
One-Way North

Work Zone

Work Zone

46th Ave

Additional  
North-South  
Connectivity

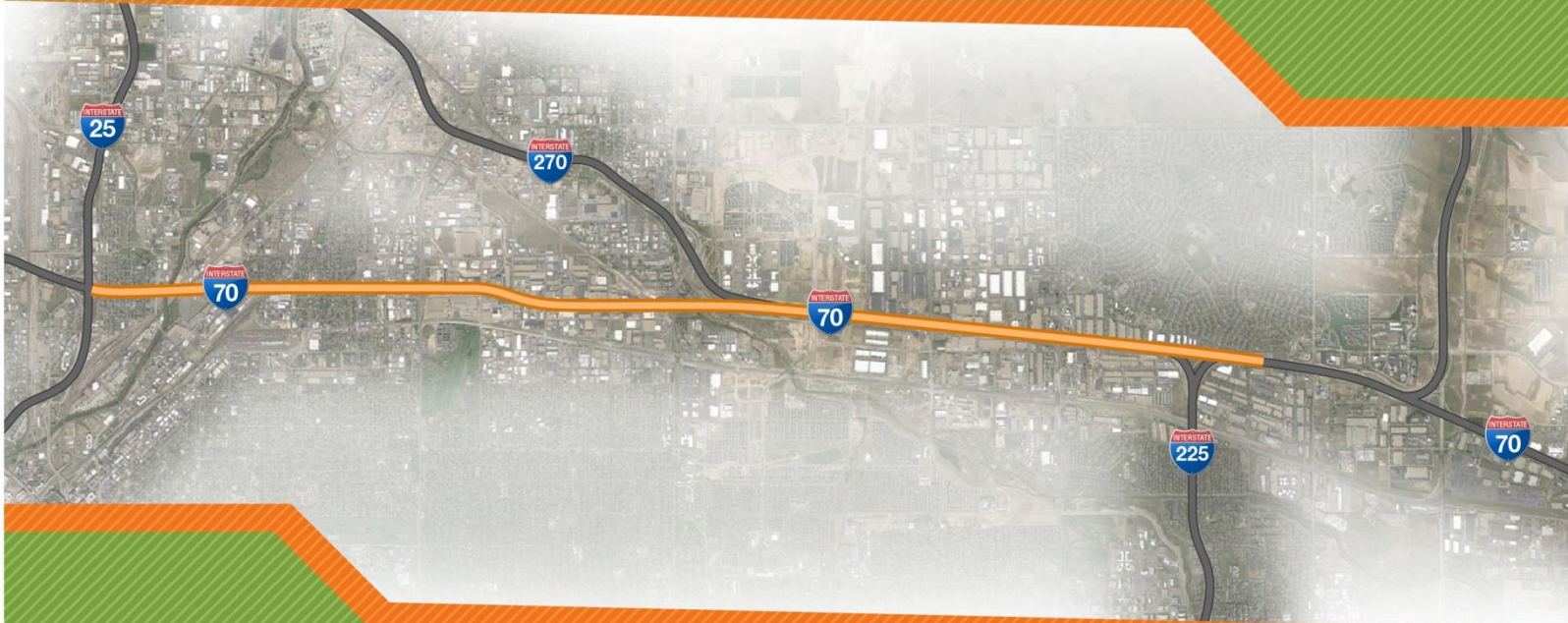
REFERENCE	SECTION	PAGE
B.3	RATIONALE	2
B.7	CONCEPTUAL DWGS	3



# Central 70 Project

Attachment B – Tracked Changes to Section 2 of Schedule 10

ATC 57.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

September 15, 2016



permitted by Section 2.11.5.a.iii. At a minimum, the Developer is required to maintain the same number of thru lanes and left turn lanes as are provided in the existing conditions unless alternative measures are used to mitigate the loss of existing conditions. Reducing the number of thru lanes and auxiliary turn lanes will need to be Approved by the Department through the MOT Variance process described in Section 2.3 (whether an MOT Variance is required from the Department or a Local Agency).

- iii. Full night Closures of Brighton Boulevard, Steele Street, Vasquez Boulevard, Colorado Boulevard, Quebec Street, and Peoria Street are permitted during the Construction Period only between 10:00 PM and 5:00 AM (other than on a Holiday), provided that:
  - A. a maximum of six such Closures in relation to each such roadway is permitted during the whole of the Construction Period; and
  - B. the implementation of any such Closure is subject to prior Acceptance by the Department.

The Developer shall prepare the TMP, TCPs, Project Schedule, and perform Construction Work in accordance with the permitted construction Closures defined in this Section 2.11.6.

- iv. Roadway Closures for north-south facilities shall be in accordance with Table 2-2. The Construction Work restrictions, as shown in the table, show where concurrent Closures are not permitted.

**Table 2-2 Concurrent Full Roadway Closure Restrictions for North-South Facilities**

	Roadway Closures Not Permitted								
	UPRR Crossing	York Street	Josephine Street	Columbine Street	Clayton Street	Fillmore Street	Dahlia Street	Holly Street	Monaco Street
York Street		-	X	X					
Josephine Street		X	-	X					
Columbine Street		X	X	-	-	X			
Clayton Street		X	X	-	-	X			
Fillmore Street					X	-			
Dahlia Street							-	X	
Holly Street							X	-	X
Monaco Street								X	-

X means concurrent full roadway Closures are not permitted

- b. For certainty, for purposes of the definition of Construction Closure Deduction, paragraph b. of such definition in Part A of Annex A (Definitions and Abbreviations) to the Project Agreement shall apply to any full roadway Closure not permitted by Table 2-2.
- c. East and West Connectivity and Roadway Restrictions



DATE: December 15, 2016  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 58.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 58.0 was reviewed by the Procuring Authorities prior to the December One-on-One Meetings and an initial response was sent to you on November 15, 2016. As discussed during the December One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 58.0 proposes to utilize 17.5 ft. clearance for overhead signs, including electronic signs and ITS devices.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).
- 5. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Detailed ATC Submission. The ATC is conditionally approved.

Conditions of approval:

- 1. All AVIs shall have an 18.5 foot clearance from the roadway surface.





The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

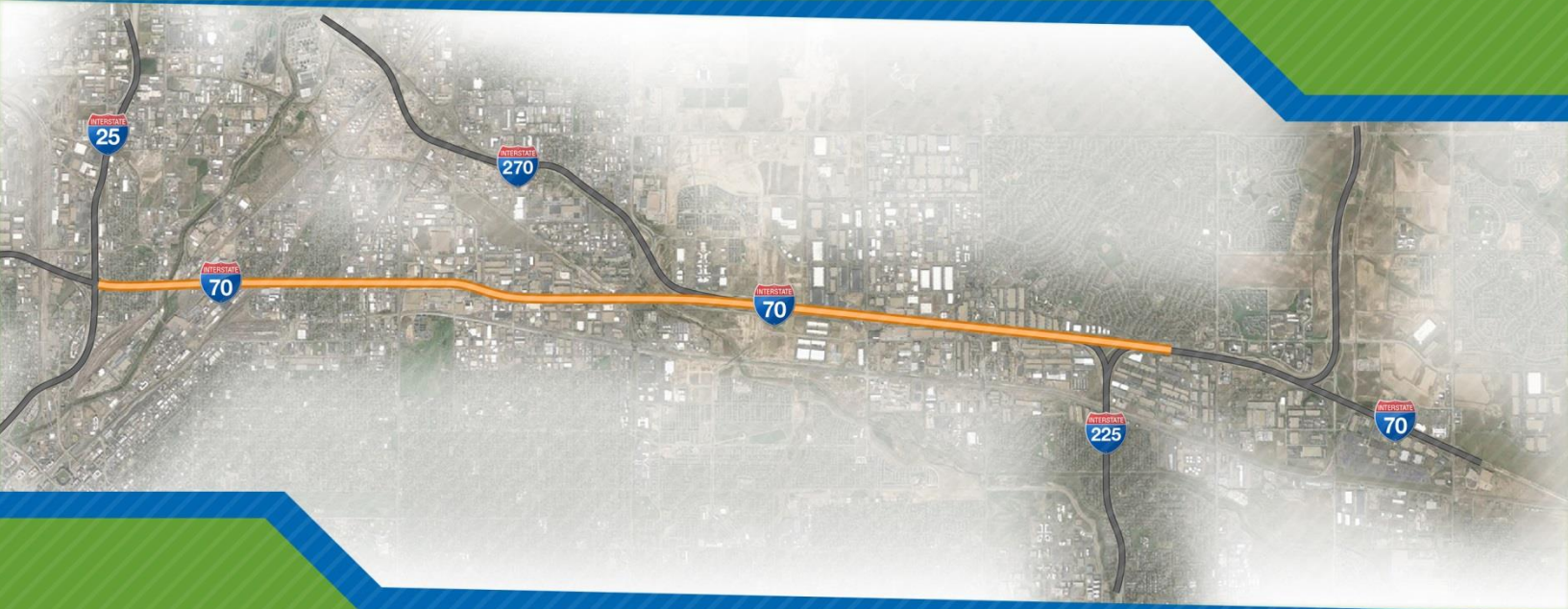




# Central 70 Project

Alternative Technical Concept Submission

ATC 58.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** October 18, 2016

**Central 70 Project RFP: ATC Submission No. 58.0**

**Overhead Signs Vertical Clearance**

### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### ATC 58.0 Benefits

- ✓ Improves corridor safety
- ✓ Optimizes scope through use of Practical Design
- ✓ Equal or better performance and reliability
- ✓ Minimizes impacts to the local community
- ✓ Reduces light pollution

### B. General ATC Submission Requirements

#### 1. Overview Description

Kiewit-Meridiam Partners (KMP) has reviewed the Project requirements from a Performance-Based Practical Design (Practical Design) perspective to identify potential cost saving solutions that align with the Project Goals. Through the Practical Design analysis, KMP identified and developed this ATC to clarify the minimum vertical clearance requirements for all overhead signs, including electronic signs and ITS devices, along the I-70 Mainline. Currently, the Project Agreement prescribes 18 ft. (Section 3 of Schedule 10) and 17.5 ft. (Section 11 of Schedule 10) of minimum vertical clearance for overhead signs.

KMP is proposing to utilize the 17.5 ft. requirement which meets or exceeds all applicable CDOT standards and has been implemented successfully on recent local projects including US-36. This ATC will result in approximately \$200,000 of cost reduction by eliminating the excess clearance criteria while improving the visibility of overhead signs between structures in the Lowered Section.

#### 2. Relevant RFP Requirements

KMP requests modifications to Sections 3.8.6 and 11.3.1 of Schedule 10 of the Project Agreement (PA). The proposed modifications are shown in **Attachment A**.



### 3. Rationale

As defined in CDOT standard plan S-614-50 Rev. 3 and S-614-60 Rev. 3, the minimum vertical clearance for static sign panels and variable message signs is 17.5 ft. Additionally, Section 11 of Schedule 10 specifies that *“The Developer shall mount all overhead signs along the I-70 Mainline with a minimum vertical clearance of 17.5 feet”*. However, Section 3 of Schedule 10 prescribes *“The Developer shall mount all overhead signs, including electronic signs and ITS devices along the I 70 Mainline that are over the roadway lanes or shoulders, with a minimum vertical clearance of 18.0 feet.”* This ATC seeks to clarify the conflicting requirements of the Project Agreement and utilize 17.5 ft. minimum vertical clearance for all overhead signs. This will bring the Project Agreement and CDOT standards into alignment while providing several additional benefits to the Project.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Public:** The minimum vertical clearance of bridges throughout the Lowered Section is 16.5 ft. Due to the quantity and proximity of structures, the utilization of 17.5 ft. of minimum vertical clearance for overhead signs will increase visibility of the signs for the travelling public as they pass through the Lowered Section. Increasing visibility of sign structures will result in a direct increase to safety of travelling public in the corridor.
- **Optimization of Scope:** The utilization of 17.5 ft. of minimum vertical clearance for overhead signs will optimize the scope through a reduction in the size of the sign posts and associated drilled shafts. Additionally, this ATC will help optimize scope through use of current CDOT standards which already exceed the minimum vertical clearance of 17 ft. required in 2009 MUTCD Section 2A.18.
- **Minimize Impacts to the Travelling Public, Businesses and nearby Communities:** The reduction in sign size has potential to decrease localized construction durations which will help limit the impacts to the traveling public and local community. Additionally, reduced sign structure size will limit the potential encroachment on narrow outside shoulders.
- **Enhances Community Value:** The reduced sign structures will decrease the amount of sign light visible to the surrounding neighborhood thereby minimizing localized light pollution.

### 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts. This ATC aligns directly with the Project Goals described above and fulfills all commitments of the FEIS.

This ATC is anticipated to positively impact the Project through:

- **Environmental Sustainability:** This ATC will reduce the size of sign structures will limit the consumption of resources while providing a solution that complies with all CDOT standards.



- **Neighborhood Impacts:** Decreasing localized construction durations and traffic will minimize impacts to the local neighborhoods. Additionally, the reduced sign structures will minimize localized light pollution.

## 5. Cost and Benefits Analysis

This ATC proposes to utilize the PA requirement which aligns with the standard CDOT criteria. This will result in a reduction of quantities and construction cost associated with overhead sign structures. Preliminary cost estimates indicate that utilizing the 17.5 ft. minimum vertical clearance will result in a **construction cost reduction of approximately \$200,000.**

## 6. Schedule Analysis

While localized construction durations will potentially be reduced, initial schedule analysis indicates no significant schedule savings to the overall Project.

## 7. Conceptual Drawings

N/A

## 8. Past Use

The minimum vertical clearance requirement for overhead signs is 17.5 ft. in Colorado and is typical across multiple state jurisdictions.

## 9. Additional Information

N/A

## C. Detailed ATC Requirements

### 1. Risks

There are no other risks to the Procuring Authorities, CDOT, the State, or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

### 4. List of Required Approvals

No additional approvals are necessary.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for exclusive use by KMP upon acceptance of this ATC:

1. Schedule 10, Section 3.8.6 of the PA
  2. Schedule 10, Section 11.3.1.k of the PA
- b) Proposed Revisions to address Inconsistencies

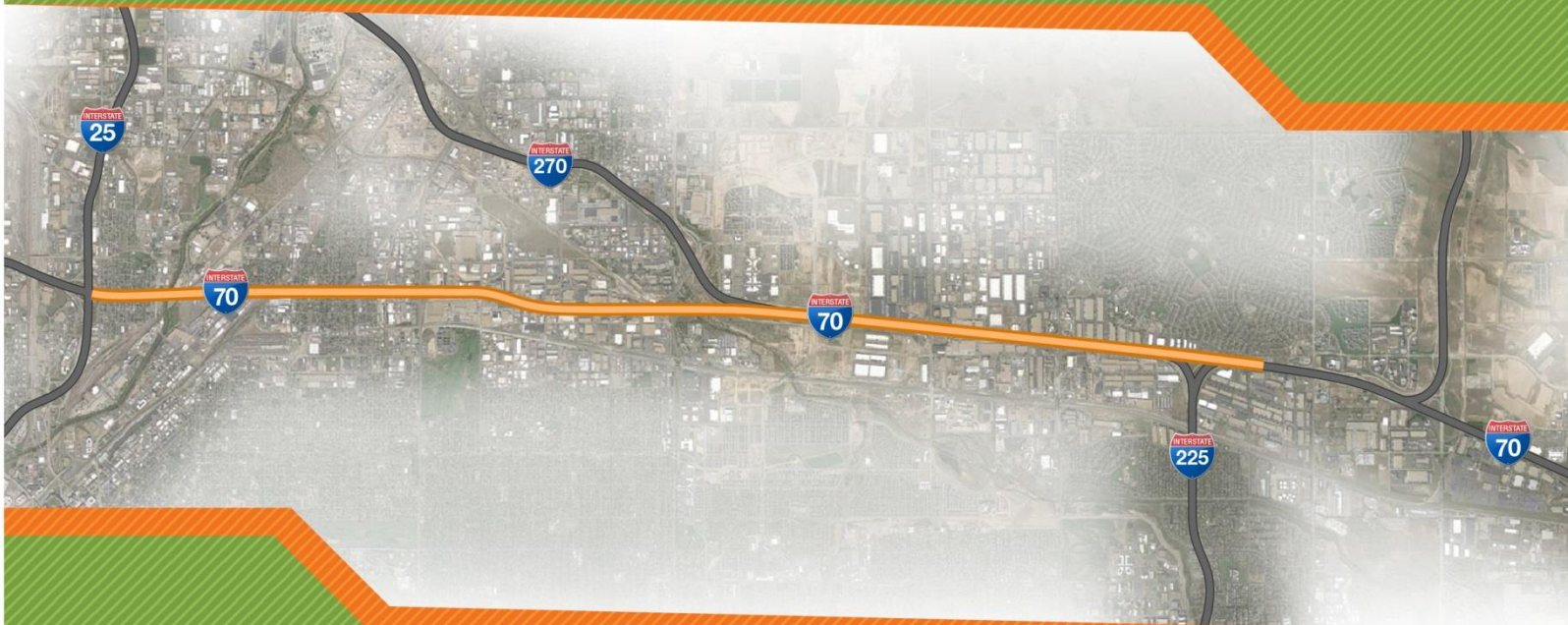
KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 3 of Schedule 10

ATC 58.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

October 18, 2016



- iii. Fiber optic conduit shall be located along 46th Ave. under the sidewalk. It shall not be located in the travel way unless Approved by the Department; and
- iv. CWDM technology shall be used for CDOT's ITS optical Ethernet communications which shall include CWDM SFP optic modules in both the field switches and the node building aggregation switches, CWDM thin filters at all CWDM splice locations and the multiplexer/demultiplexer installed in the node buildings. The Developer shall design up to 20 CWDM Ethernet switches on a pair of fiber strands to ensure fiber utilization, with two switches allowed per wavelength. The Developer shall request Approval from the Department if there are cases where more than two switches per wavelength are needed. Fiber strands shall connect to separate node buildings aggregation switches to achieve the required ITU-T G.8032 Ethernet ring protection switching.

### 3.8.6. Vertical Clearance Requirements

#### a. Design Requirements

~~See Schedule 10, Section 11 Signing, Pavement Markings, Signalization, and Lighting for additional information vertical clearance requirements. The Developer shall mount all overhead signs, including electronic signs and ITS devices along the I-70 Mainline that are over the roadway lanes or shoulders, with a minimum vertical clearance of 18.0 feet. This is measured from the highest point of the roadway surface, under the electronic signs or devices, to the bottom of the equipment (including walkways). AVIs shall have an 18.5 feet clearance from the roadway surface. Structure cross sections shall be provided and show signing mounting, hangers, equipment, control boxes, conduits, conduit penetrations, hand holes, vertical clearances with all dimensions. If ATM signage/signals or tolling equipment are planned on structures the vertical clearance is measured to the bottom of the LUS signals, tolling equipment and any future equipment. Therefore, sign panels and structures must accommodate the additional clearance required for the proposed and future ATM/Tolling. See Schedule 10, Section 11 Signing, Pavement Markings, Signalization, and Lighting for additional information.~~

~~None.~~

### 3.8.7. Dynamic Message Signs

#### a. Design Requirements

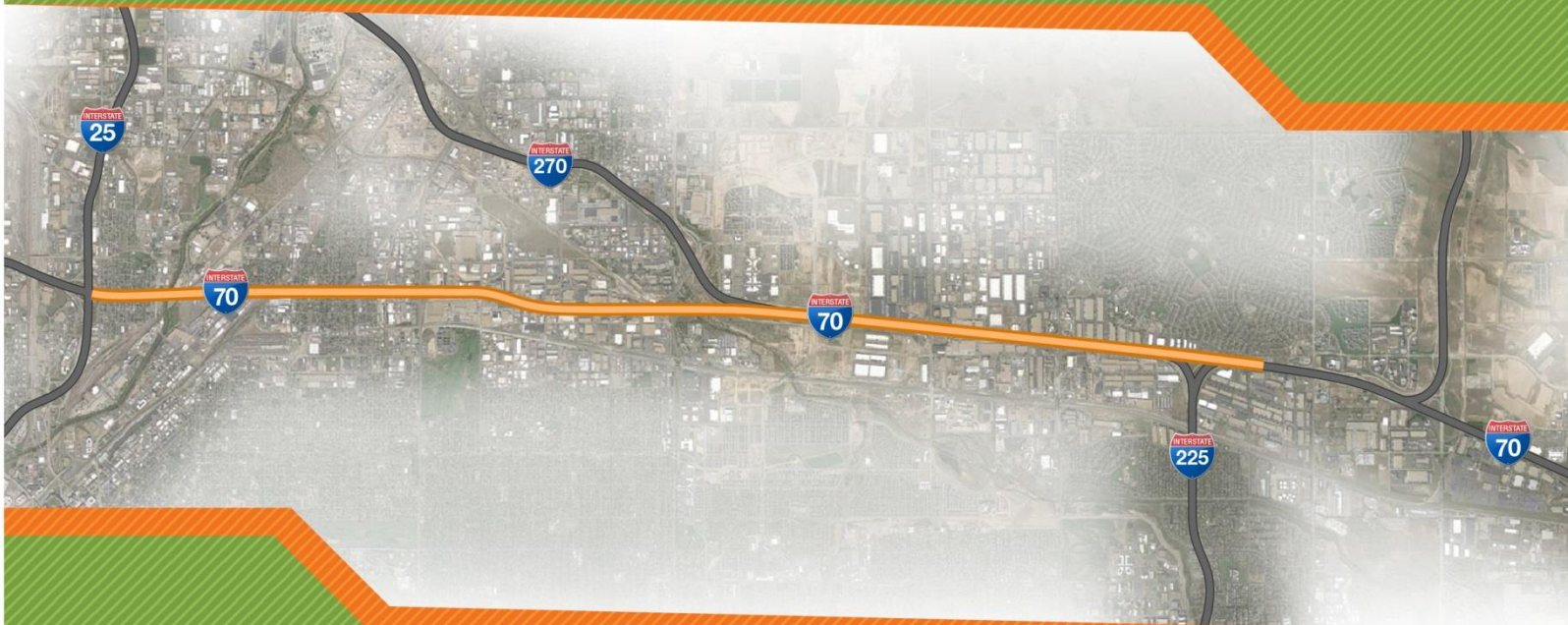
- i. The DMS's are large dynamic displays that are used for a wide range of purposes, including providing driver information regarding weather advisories, travel times, amber alerts, toll information, construction, and incident notifications. The Developer shall design a complete DMS system. Final sign locations may need to be adjusted due to roadway geometry, conflicts with other signs or Cover requirements. Final locations of all DMS shall be Approved by the Department. Approximate DMS locations are as follows:
  - A. Westbound Full Color DMS shall be installed at the following approximate locations:
    - (I) 0.4 miles east of Airport Blvd
    - (II) 0.5 miles west of Peoria St
    - (III) Between Havana St and in advance of the I-270 off ramp
    - (IV) 0.8 miles east of Colorado Blvd
  - B. Eastbound Full Color DMS shall be installed at the following approximate locations:
    - (I) Between I-25 and Brighton Blvd
    - (II) Between the Cover and Vasquez Blvd



# Central 70 Project

Attachment A – Tracked Changes to Section 11 of Schedule 10

ATC 58.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

October 18, 2016



- f. During the Construction Period the Developer shall re-set the existing permanent signs on the I-70 Mainline that display the LOGOS. The Developer shall coordinate with the contractor responsible for managing the LOGOS program for the correct placement of these signs. Contact information for the LOGOS program can be found at [www.colorado.interstatelogos.com](http://www.colorado.interstatelogos.com). At the end of the Construction Period these signs shall be incorporated into the Permanent Signing Plan at the direction of the LOGOS program manager following the Approval of the Department;
- g. The Developer shall coordinate with the Regional Transportation District (RTD) to replace wayfinding signs for RTD stops and stations in and outside the Site. If existing wayfinding signs require removal, alternative equivalent signs shall be replaced, as directed by RTD;
- h. Mile markers are required for the entire length of the Project and shall be displayed every 0.1 mile. In addition, delineators are required; Mile markers and delineators shall be installed in accordance with the Construction Standards;
- i. Signing designs shall include details of size, legend and locations of ground-mounted and overhead signs, dimensions of Class III sign supports, layouts/dimensions of all special signs, and structural and foundation requirements. Details to be submitted shall include structure cross sections, display signing mounting, hangers, equipment, control boxes, conduits, holes, hand holes, vertical clearances, the Right-of-Way (ROW) line, Utility conflicts, panel sizes, tolling attachments, all Intelligent Transportation Systems (ITS) attachments, Active Traffic Management (ATM) elements, cabinets, conduit locations, caisson foundation sizes and depths, shoulder, General Purpose Lane and Tolloed Express Lane widths, correct sign placement over each lane, direction, barrier protection type, station and offset, etc. Refer to Schedule 10, Section 13 Structures for requirements and coordination;
- j. Where CDOT sign structure standards cannot be met, the Developer shall submit alternative designs, such as custom designed monotube sign structures and foundations, for Approval. Permanent signage on Bridges shall not be hung from or be attached to the face of Bridge superstructures. Existing signs attached to Bridge superstructures shall be removed and replaced with monotube sign bridges or cantilever structures with new signs. Refer to Schedule 10, Section 13 Structures for requirements and coordination;
- k. The Developer shall mount all overhead signs along the I-70 Mainline with a minimum vertical clearance of 17.5 feet and a maximum of 18.5 feet measured from the roadway surface under the sign panels and/or electronic signs to the bottom of the Variable Message Sign (VMS), Variable Toll Message Sign (VTMS), lane use signal (LUS), [ITS device](#) or guide sign (whichever is lowest). Structure cross sections shall be submitted and display signing mounting, hangers, equipment, control boxes, conduits, holes, hand holes, vertical clearances and all dimensions. Refer to Schedule 10, Section 3 ITS and Tolling Equipment for requirements and coordination;
- l. Sign lighting on overhead guide signs shall not be permitted; and
- m. Unless stated otherwise, walkways shall not be permitted on overhead guide sign structures.

#### 11.3.2. Signing Materials

- a. The materials for sign posts for each class of sign shall comply with the respective requirements of the Construction Standards. The use of wood posts for mounting ground signs is not permitted and all Class I and Class II sign posts shall use schedule 80 in lieu of schedule 40 material;
- b. All Class I, II, and III ground signs shall include breakaway devices per CDOT *S-Standard Plans*. Guide signing on approaches to interstate interchanges on local and arterial roadways shall include advance entrance directional signing. On major cross streets that do not access the I-70 Mainline, supplemental I-70 directional route marker assemblies are required;



DATE: December 15, 2016

TO: Kiewit-Meridiam Partners (KMP)

FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 62.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 62.0 was reviewed by the Procuring Authorities prior to the December One-on-One Meetings and an initial response was sent to you on December 1, 2016. As discussed during the December One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 62.0 proposes to remove the requirement for the anti-graffiti coating.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;
  - Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).
- 5. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Detailed ATC Submission. The ATC is unconditionally approved.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



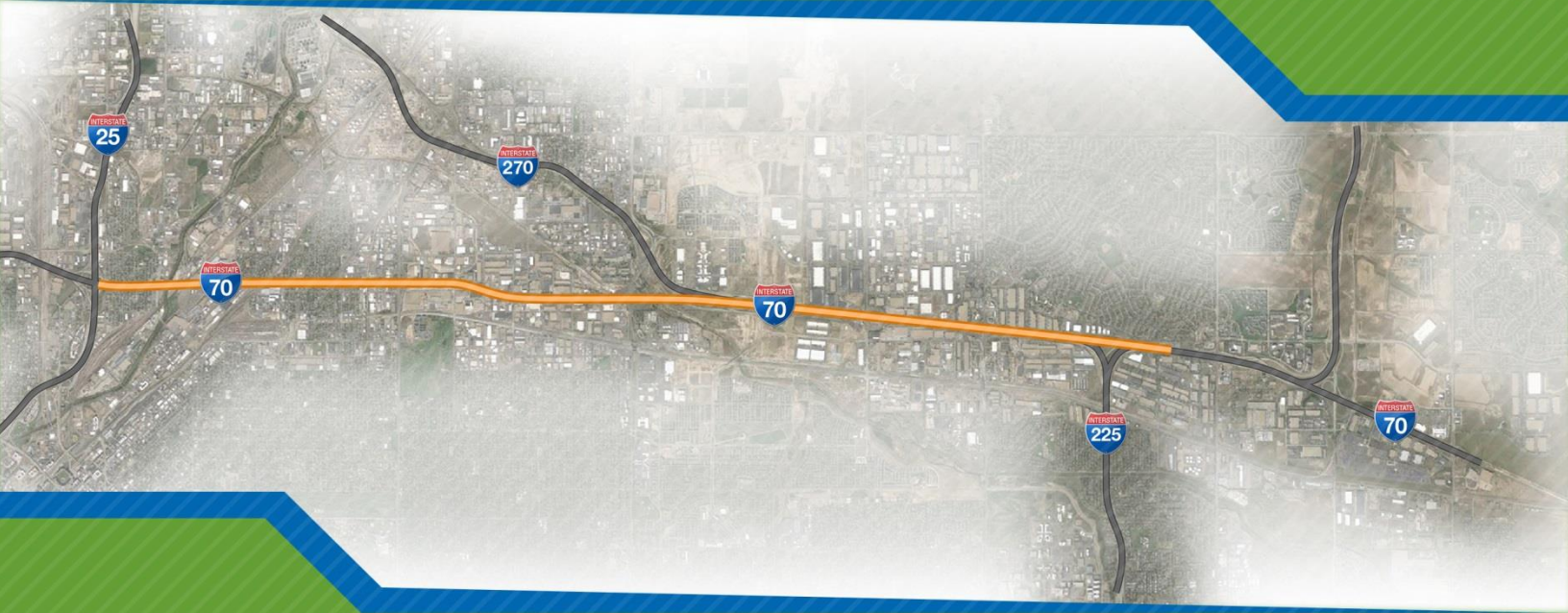




# Central 70 Project

Alternative Technical Concept Submission

ATC 62.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** November 08, 2016

**Central 70 Project RFP: ATC Submission No. 62.0**

### Anti-Graffiti Coating

#### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

#### ATC 62.0 Benefits

- ✓ Optimized scope
- ✓ Equal of better functionality
- ✓ Greater design flexibility
- ✓ Optimized operating and life cycle costs
- ✓ Minimized impacts

#### B. General ATC Submission Requirements

##### 1. Overview Description

Kiewit-Meridiam Partners (KMP) has reviewed the Addendum No. 5 changes of Section 13 to Schedule 10 of the Project Agreement and has developed this ATC to remove the prescribed requirement for the use of “Acryli-Master” anti-graffiti coating on all concrete surfaces. KMP has extensive past experience on projects with graffiti removal and has found that, while each project is unique, the lifecycle costs vary greatly depending on the graffiti removal approach utilized. Therefore, this ATC proposes to rely on the performance requirements of Appendix A-1 to Schedule 11 for graffiti removal, as opposed to prescribing the use of a specific product.

##### 2. Relevent RFP Requirements

Section 13.12 Finishing Structure Concrete Surfaces specifies:

*“All exposed concrete surfaces shall have a surface treatment of anti-graffiti coating as specified in the Project Special Provision 601, Anti-Graffiti Coating.”*

This ATC proposes to remove this section entirely and rely on the Performance Requirements for Graffiti Removal in Schedule 11 Appendix A-1.

### 3. Rationale

KMP's past experience shows that several factors determine the most cost-effective lifecycle solution for graffiti removal. The final solution varies from project-to-project based on location, climate, and product selection. In certain instances, it can be more cost-effective to forgo anti-graffiti coatings and rely on repainting as the primary solution for graffiti removal. The Central 70 Project is unique and may require a combination of solutions to meet the performance criteria and produce the lowest lifecycle maintenance cost.

KMP understands that the murals and local art throughout the Project cannot rely solely on repainting as the primary solution. However, this ATC proposes to allow KMP to conduct a full lifecycle analysis of the Project and determine the appropriate application and product selection for anti-graffiti coating. This ATC directly aligns with the following Project Goals:

- **Optimizes of Scope:** Providing KMP flexibility to determine the best solution for graffiti removal will deliver the most optimal scope while maintaining equal or better functionality.
- **Optimization of the Lifecycle Maintenance Costs:** KMP will perform a full lifecycle analysis to determine the appropriate application and product selection of anti-graffiti coating. This will ensure that best value is delivered to the Department.
- **Minimize Impacts:** The approach under consideration generally reduces the time required to perform graffiti removal. This will lessen the impacts to the traveling public by decreasing the durations of associated shoulder/lane closures.

### 4. Impacts

This ATC presents no potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance or third party impacts.

### 5. Cost and Benefits Analysis

**Preliminary cost estimates indicate an overall savings to the Project of up to \$500,000.**

### 6. Schedule Analysis

This ATC will potentially reduce the duration of localized construction durations; however, no significant schedule savings are anticipated.

### 7. Conceptual Drawings

**Attachment A:** Tracked changes to Section 13 of Schedule 10

### 8. Past Use

Prudent procedures based on performance criteria for graffiti removal is a Best Management Practice used throughout the country with both agencies and industry.

### 9. Additional Information

N/A

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

### 4. List of Required Approvals

No change in the approvals is required to implement this ATC.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

This ATC will require modification of Section 13.12.b to Schedule 10

#### b) Proposed Revisions to address Inconsistencies

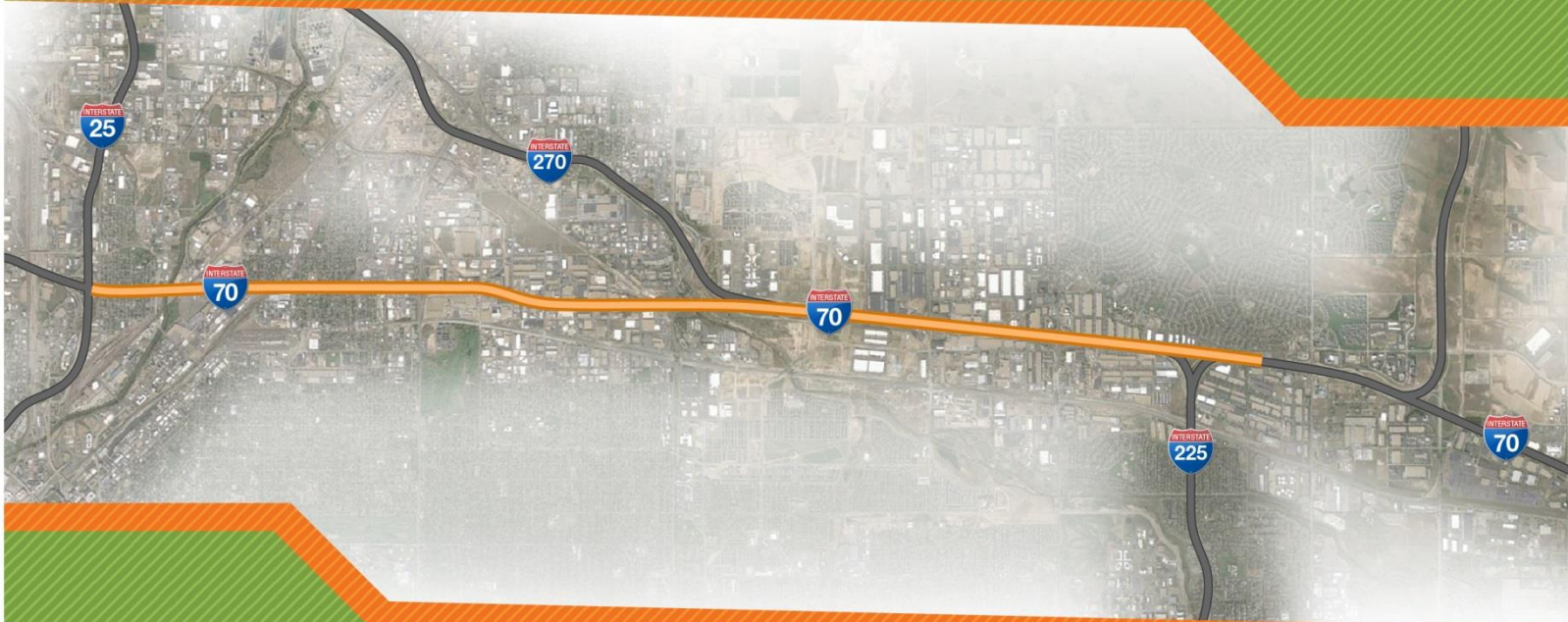
A copy of the proposed changes to the RFP are attached.



# Central 70 Project

Attachment A – Tracked Changes to Section 13 of Schedule 10

ATC 62.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

November 08, 2016



Posts shall be reinforced concrete, prestressed concrete, or galvanized and painted steel.

c. Foundations

Foundations shall be posts set in concrete, flowfill, caissons, cast-in-place, or precast reinforced concrete footings. The bottom of all spread footing foundations shall be placed a minimum of three feet below finished grade. Reinforcing steel projecting into the above ground portion of walls, subject to splash from the roadway (areas within 10 feet horizontally of the edge of travel lane), shall be epoxy coated.

### 13.11. Sign Structures

#### 13.11.1. General

- a. The Developer shall remove all existing sign structures per the limits as defined in Schedule 10, Section 11 Signing, Pavement Marking, Signalization, and Lighting. Static sign structures and supports meeting the geometric and sign layout requirements shown in the CDOT *M & S Standard Plans*. For static sign structures and supports that do not meet the geometric and sign layout requirements shown in the CDOT *M & S Standard Plans*, the structure shall be designed and constructed in accordance with the latest AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. Use Fatigue Category I for overhead sign structures. Sign structures shall be galvanized structural steel (single) tubing.
- b. Variable Message Signs (VMS) shall be mounted on a sign bridge. The Developer shall prepare a structural design for each VMS structure in accordance with above specified AASHTO requirements and provide to the Department for Acceptance.
- c. All sign structures shall include hand holes on poles for addition of future lighting.
- d. The Developer shall provide minimum vertical clearance for static and dynamic sign structures in accordance with Schedule 10, Section 11 Signing, Pavement Markings, Signalization, and Lighting.
- e. Components
  - i. Foundations  
Drilled caissons shall be used to support overhead and cantilever sign structures. The Developer shall prepare one Project Foundation Report for all sign structures for Acceptance, and shall have one foundation boring near each single caisson supporting monotube sign supports.
  - ii. Connections  
Shop splices shall be made with full-penetration butt welds. Base connections shall be made with full-penetration shop butt welds. All sign connection hardware shall be galvanized, with strengthened structural tubing at electrical connection openings.
  - iii. Bridge-Mounted Signs  
The Developer shall not mount signs on bridges.

### 13.12. Finishing Structural Concrete Surfaces

- a. All exposed concrete surfaces shall have a surface treatment of concrete stain as specified in Project Special Provisions 601 and 708, Structural Concrete Stain. This includes all bridges, retaining walls, noise walls, concrete roadway/bridge barriers, and slope protection. The color of the structural concrete stain shall be as noted in the Aesthetic Standards.
- ~~b. All exposed concrete surfaces shall have a surface treatment of anti-graffiti coating as specified in Project Special Provision 601, Anti-Graffiti Coating.~~



DATE: March 3, 2017  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 66.0

Dear Mr. Dionisio:

Your Team’s ATC Submission Form for Detailed ATC 66.0 was reviewed by the Procuring Authorities prior to the February One-on-One Meetings and an initial response was sent to you on February 9, 2017. As discussed during the February One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 66.0 proposes to utilize a performance standard in lieu of the proposed prescriptive air monitoring requirements detailed for the Cover section of the Project Agreement.

In accordance with the Instructions to Proposers (“ITP”), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer’s Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).
- 5. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Detailed ATC Submission. The ATC is approved with the following conditions:

Conditions of Approval:

- 1. The proposed modifications to Section 12.13.10.b that would permit the Contractor to forgo measurement of airspeed, air flow direction, or temperature under certain circumstances are not



acceptable to the Procuring Authorities. The sensors to measure airspeed, air flow direction and temperature inside and outside of the Cover will be required.

2. The Developer shall be solely responsible for any additional Governmental Approvals required to implement this ATC. In particular, approval from Denver Environmental Health will be required.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



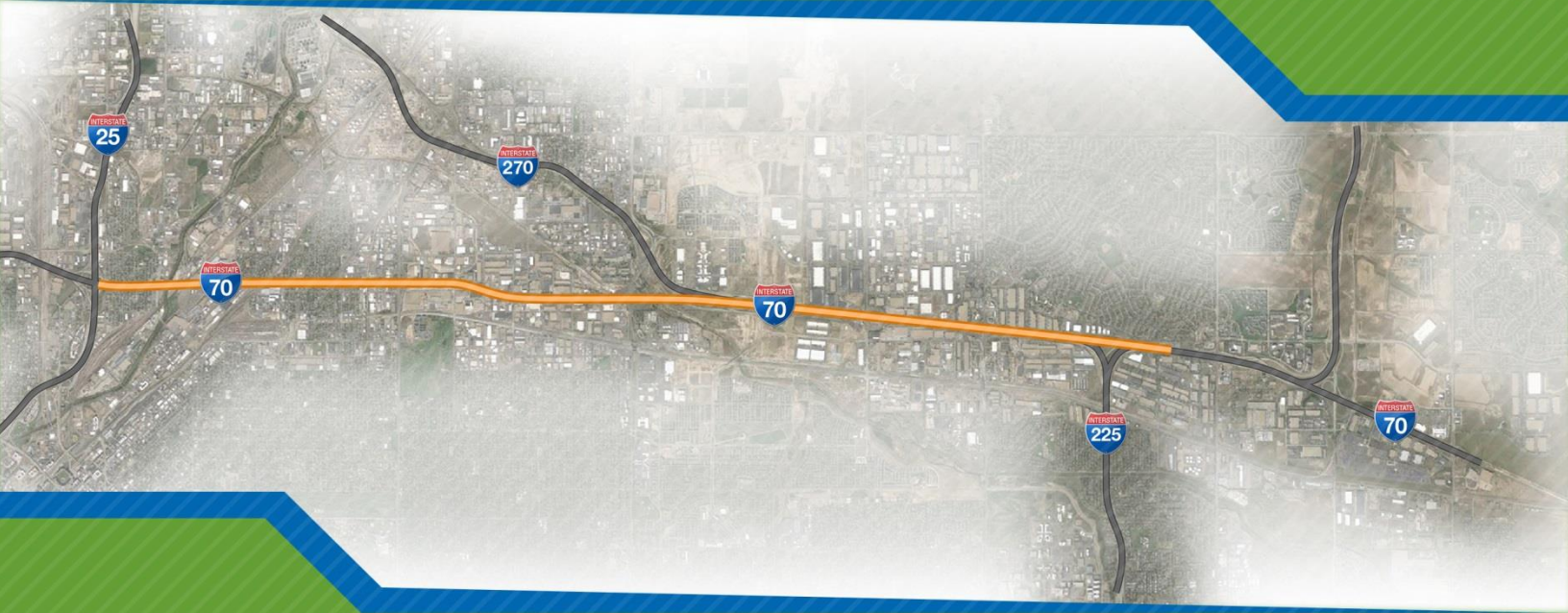




# Central 70 Project

Alternative Technical Concept Submission

ATC 66.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** January 24, 2017

**Central 70 Project RFP: ATC Submission No. 66.0**

**Cover Air Quality Monitoring**

### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### ATC 66.0 Benefits

- ✓ Allows for Greater Design Flexibility
- ✓ Equal or Better Performance
- ✓ Optimizes Lifecycle and Maintenance Costs
- ✓ Minimizes Impacts
- ✓ **Over \$250,000 in Cost Benefit**

### B. General ATC Submission Requirements

#### 1. Overview Description

In effort to provide the Procuring Authorities with an innovative, flexible, and cost effective design solution, Kiewit-Meridiam Partners (KMP) proposes to utilize a performance standard in lieu of the proposed prescriptive air monitoring requirements detailed for the Cover section of the Project Agreement (PA). Schedule 10, Section 12.13.10 of the PA requires monitoring of carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), visibility, air speed, air flow direction, and temperature in the Cover section utilizing a specific number of sensors - fourteen (14) sensors. This ATC proposes to reduce the prescriptive quantity of sensors, yet achieve the same result as current PA requirements through adherence to the proposed performance standard.

Implementing a performance standard to monitor air quality will allow KMP to optimize design through an equal, or better solution. Significant cost savings over the term of the Project will result from implementation of this ATC. The single most important consideration in development of all concepts is to ensure the safety of the workforce and public. This ATC has been analyzed thoroughly to ensure the proposed PA revisions reduce maintenance without posing any adverse impact on the ability to continuously monitor air quality within the Cover.

#### 2. Relevent RFP Requirements

Schedule 10, Section 12.13.10.e requires a total of eight sampling points (four per bore). Section 12.13.10.h requires six air speed monitors, two in each bore and four outside of the

Cover (effectively at each portal). It is recommended that Section 12.13.10 be reworded as a performance based standard focused on air quality.

### 3. Rationale

KMP is proposing to use a performance standard to provide air quality monitoring equal to the requirements currently prescribed in the PA while reducing the quantity of air quality sensors. The number of sensors asked for in the PA is excessive for a facility of this length where longitudinal ventilation is employed (eight inside the tunnel for vehicle emissions, and then another six monitors for air speed inside and outside of the Cover). The proposed performance standard will provide demonstration of adequate performance through the following:

- Sensors to measure CO, NO<sub>2</sub>, and visibility inside the Cover (to control air quality levels).
- Fan equipment sensors to register air flow and direction of fan operation (to verify that ventilation is operational), making velocity and temperature measurement sensors unnecessary.
- Analysis to demonstrate likely pollution level during normal free flowing traffic, full congested traffic (stopped) with and without external wind.

This will result in reduced maintenance, reduced systems integration requirements, and simplified programming and operation. This Concept directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** First and foremost, KMP is committed to protecting the safety of the workforce and public. The proposed Concept reduces the time and frequency of maintenance, inspection and testing of sensors over the term of the project, thus reducing worker exposure to vehicular traffic.
- **Optimize Operating and Life Cycle Maintenance Costs:** The proposed ATC will substantially reduce the O&M requirements associated with the system's rigorous maintenance requirements, simplify system commissioning, and reduce significant rehabilitation/replacement costs.
- **Optimize the Scope:** Reducing the quantity of air quality sensors provides a more efficient Project scope while maintaining an equivalent level of air quality monitoring.
- **Minimize Impacts to the Traveling Public:** Potential lane restrictions and impacts to the traveling public are minimized by reduced maintenance time.
- **Ensure Reliable Travel Speeds:** As described above, this alternative concept will reduce maintenance time under the Cover, resulting in more reliable travel speeds over the term of the project.

### 4. Impacts

This ATC presents no potential adverse environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts.

### 5. Cost and Benefits Analysis

Preliminary cost estimates indicate that the cost savings of this ATC will exceed **\$250,000**.

## 6. Schedule Analysis

This ATC has no impact on the construction schedule; however, maintenance durations will be reduced over the term of the project.

## 7. Conceptual Drawings

**Attachment A:** Tracked changes to Section 12 of Schedule 10

## 8. Past Use

The new Midtown Westbound tunnel in Norfolk, Virginia, is 4,198 feet long and utilizes four air quality sensors. The Port of Miami tunnel is 4,200 feet long and it utilizes four air quality sensors per bore. Both tunnels are operational with no known issues with regard to air quality sensors.

## 9. Additional Information

N/A

### Detailed ATC Requirements

#### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC.

#### 2. Handback

There are no changes in handback procedures and/or the Handback Requirements associated with this ATC.

#### 3. Right-of-Way

No additional Right-of-Way is required to implement this ATC.

#### 4. List of Required Approvals

No change in the approvals is required to implement this ATC.

#### 5. Proposed Drafting Revisions

a) RFP Requirements that are Inconsistent with Proposed ATC

Schedule 10 Section 12.13.10

b) Proposed Revisions to address Inconsistencies

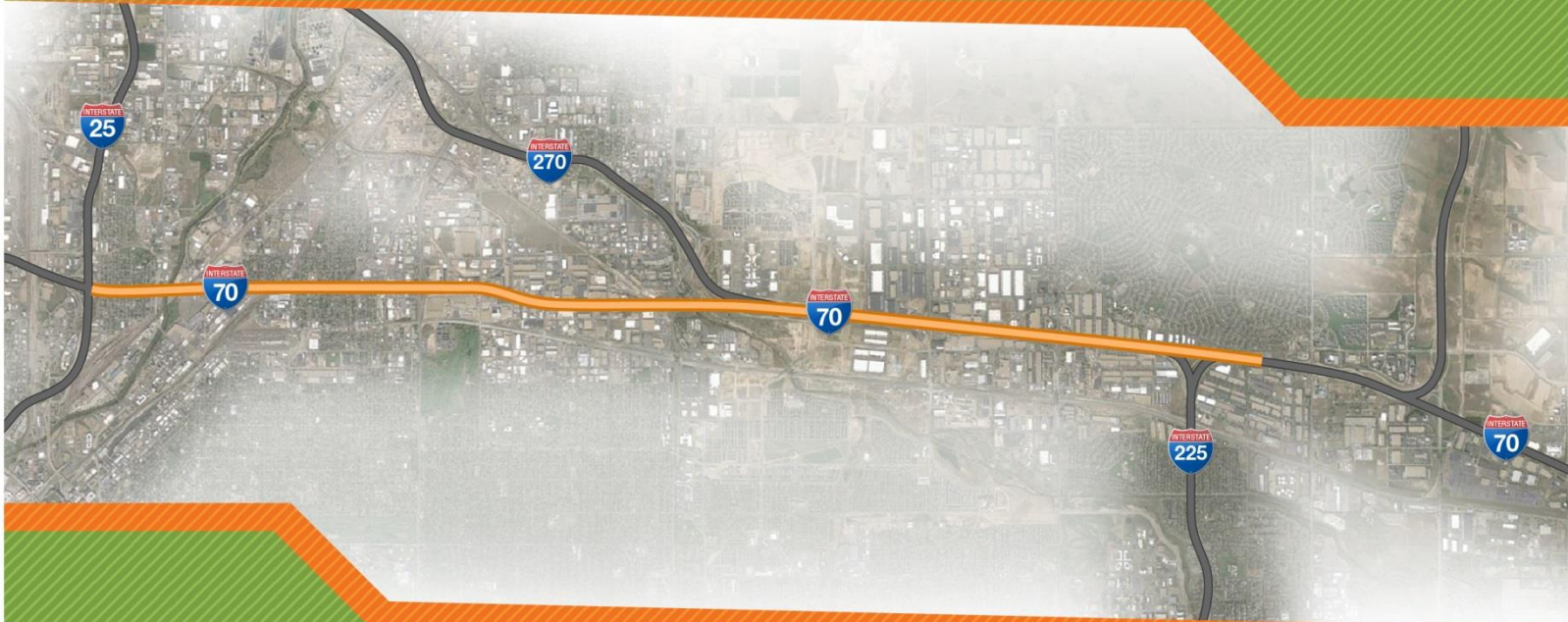
A copy of the proposed changes to the Project Agreement is attached.



# Central 70 Project

Attachment A – Tracked Changes to Section 12 of Schedule 10

ATC 66.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

January 24, 2017



a minimum period of one hour. The Developer shall include a manufacturer's type test certificate showing that the design meets these requirements as part of its design submittal.

- h. The whole fan assembly shall be waterproof and capable of withstanding water spray from maintenance washing vehicles and the FFFS. A drain fitting with cap shall be located in the lowest part of the fan housing, if not self-draining by manufacturers design.

#### 12.13.8. Jet fan motors

The jet fan motors shall conform to the following requirements:

- a. Suitable for use in the corrosive atmosphere;
- b. Suitable for use with soft starters;
- c. Be totally enclosed fan ventilated cage rotor type;
- d. Protected motor enclosure;
- e. Lifting lugs or eyes shall be provided; and
- f. Capable of being run in an inclined position, not greater than 15° from the horizontal with no detrimental effects.

#### 12.13.9. Ventilation Control System

A ventilation control system (VCS) for the CVS shall be integrated into the CCMS to:

- a. Permit interface between the operator and CVS equipment components;
- b. Provide automatic ventilation control in normal operations, ensuring the Cover is maintained within required environmental conditions that can be adjusted when required;
- c. Operate in real time to provide live monitoring, control and fault reporting of the CVS equipment;
- d. Provide real time indication of status and alarm conditions at various operator locations;
- e. Interface with and provide data transfer between related systems;
- f. Provide a secure interface between the CVS equipment and the automatic incident/fire detection systems in the event of fire in the Cover; and
- g. Minimize effects and constraints on tunnel operations through automatic reconfiguration modes in the event of plant failure or routine maintenance activities.

#### 12.13.10. Monitoring Equipment and System

Monitoring equipment shall be provided for the continuous monitoring of air quality Visibility, CO, NO<sub>2</sub>, air speed, air flow direction and temperature in the Cover and:

- a. At a minimum, sensors shall be provided to measure CO, visibility, and NO<sub>2</sub> within the cover in each direction of travel, and there shall be a back-up sensor for each quantity being measured (i.e. minimum of four sensors, assuming one self-contained sensor can measure CO, visibility and NO<sub>2</sub>);
- b. Sensors to measure airspeed, air flow direction and temperature inside and outside of the Cover shall be provided unless the Contractor can demonstrate that these quantities are not essential to control of air quality conditions or smoke movement in the Cover;
- ~~a-c.~~ For pollution monitoring, a logical method for control shall be developed for normal, maintenance and congested operations and to safeguard the fans from frequent switching;
- ~~b-d.~~ Pollutant and visibility monitors shall be located adjacent to the traffic lanes in the Cover, at locations where the worst level is anticipated; The location of sampling points shall avoid dilution by air circulation from the Portals;

- ~~e.e.~~ All monitoring equipment shall be calibrated to represent the average air quality for a 15-minute rolling average within the Cover;
- ~~d.f.~~ Monitoring system shall be provided to facilitate operational data to be recorded and stored for analysis. Data to be recorded shall include pollution levels (at least CO, visibility and NO2), Cover air speed, fan operations and alarm states, and if air speed, direction and temperature sensors are required that data shall be recorded also;
- ~~e.~~ For the measurement of pollutants, at least two sampling points shall be provided at each side of the each bore of the Cover (eight in total). The location of sampling points shall avoid dilution by air circulating from the Portals;
- ~~f.g.~~ Monitoring stations shall be located and configured so as to provide data to drive the VCS for the management of pollutants in the Cover to acceptable limits;
- ~~h.~~ Monitoring equipment shall not be installed near to jet fan inlets and outlets so as to affect the performance of the CVS; and
- ~~g.i.~~ Contractor shall provide analysis of anticipated air quality quantities in the Cover (CO, visibility, NO2, air speed, temperature) under peak hour flowing traffic, fully congested conditions (stopped traffic) with and without an external wind blowing. For each scenario Contractor shall use the analysis to compute the worst pollution level likely and to demonstrate that the monitoring equipment will provide adequate notification to prevent air quality criteria being violated.
- ~~h.~~ Six air speed and direction monitors shall be installed: two in each bore of the Cover to provide information to the operator on the flow speed and direction of air inside the Cover and two outside the Cover near to each Portal at a location suitable to provide information on external ambient wind conditions to the operator. Proposed locations shall be detailed in the Developer's Fire System Performance Report.

#### 12.13.11. Interfaces to Other Systems

- a. Command, Control and Monitoring System  
The CCMS shall read and display the status and settings of all fans and control equipment. The operator shall be able to control the ventilation on a per bore basis using a series of pre-configured plans on the CCMS.
- b. Fixed Fire Fighting System  
The CVS shall work in tandem with FFFS. The CVS shall be designed to be operated in a way that minimizes the impact on the effectiveness of the FFFS.
- c. Fire Detection and Alarm System  
The CVS shall interface to the fire detection and alarm system to determine the location of any active fire detections.
- d. Pollution Monitoring System  
The VCS shall interface with the pollution monitoring system via the CCMS, so that ventilation rates in the Cover can be set automatically, according to dilution requirements.

#### 12.13.12. Computational Fluid Dynamics Model

Effective performance in operation of the combined FFFS and the CVS shall be demonstrated through analysis with a CFD model and comparison to full scale fire test data relevant to the proposed design. The CFD model shall be validated for the proposed performance of the CVS and FFFS based on prior full scale tests of the proposed systems considering ambient conditions listed in Section 12.13.6.

#### 12.13.13. Report contents



DATE: March 13, 2017  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 68.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 68.0 has been reviewed by the Procuring Authorities. Detailed ATC 68.0 proposes an alternate drainage design for the Onsite Outfall System.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).
- 5. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

The ATC is approved with the following conditions:

Conditions of approval:

- 1. The Developer shall be responsible for performance of and all costs associated with any additional Utility Work required to implement this ATC.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.



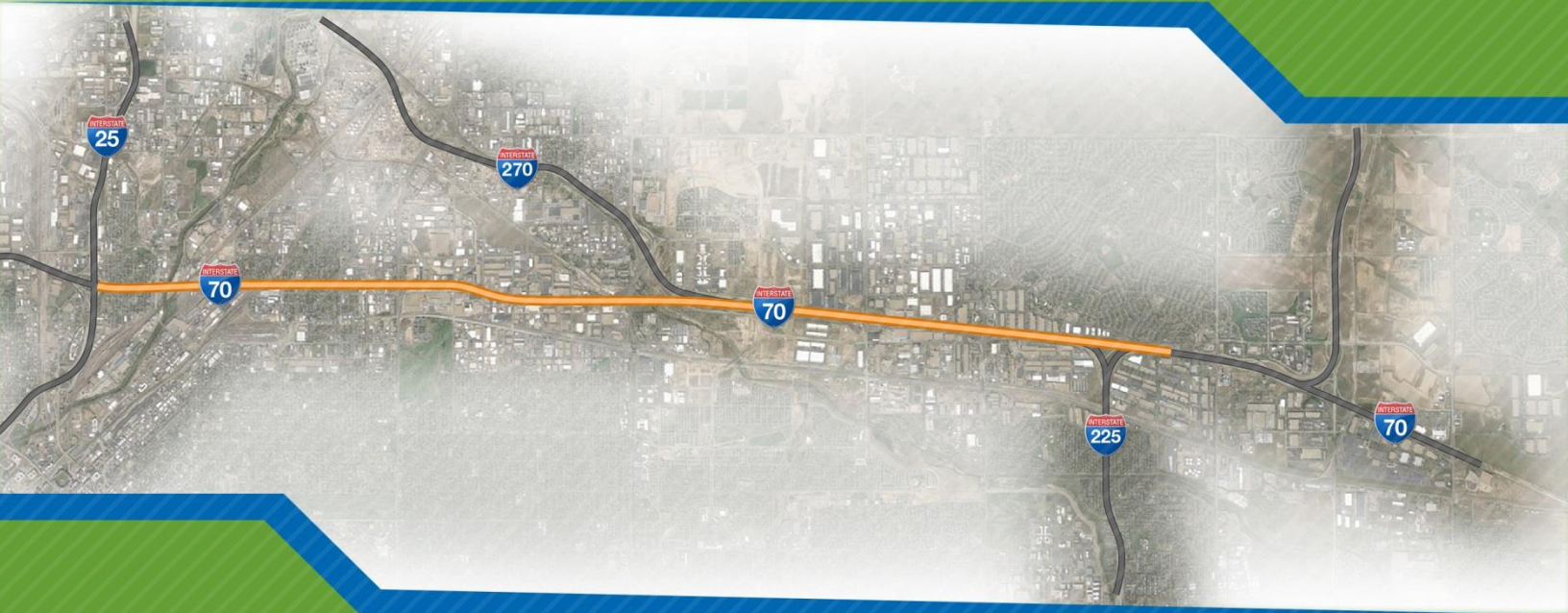




# Central 70 Project

Alternative Technical Concept Submission

ATC 68.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** February 22, 2017

**Central 70 Project RFP: ATC Submission No. 68.0**

**Onsite Drainage Outfall**

### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### B. General ATC Submission Requirements

#### 1. Overview Description

In an effort to provide the Procuring Authorities with an innovative, simpler, and cost effective design solution, Kiewit-Meridiam Partners (KMP) proposes an alternate drainage design for the Onsite Outfall System. The proposed solution relocates the pump station adjacent to I-70 at the corner of York St. and 46<sup>th</sup> Ave. N. which eliminates 5,500 LF of storm pipe and construction related impacts to Elyria/Swansea neighborhoods along the Reference Design Onsite Outfall alignment.

The proposed onsite drainage system will collect stormwater from the Lowered Section and convey it to the Pump Station located between York St. and Claude Ct. adjacent to the low-point of I-70 Mainline. The water will be pumped to a water quality pond near the pump station within Project ROW. From the water quality pond, the water will gravity drain into an existing 72 in. storm sewer in York St.

The relocation of the pump station is achievable through incorporation of several of KMP's design optimizations. These optimizations include approved ATC 12.2 which provided additional capacity in the existing 72 in. storm sewer in York St. by redirecting offsite flow from the south of I-70 mainline. KMP understands that each ATC must stand on its own merits and shall not be

### ATC 68.0 Benefits

- ✓ Lowers initial capital and future maintenance costs
- ✓ Reduces construction duration for the proposed storm drain
- ✓ Reduces construction related traffic and community impacts
- ✓ Eliminates the outfall location to the South Platte River
- ✓ Equal or better performance and reliability
- ✓ Optimizes the scope
- ✓ Optimizes operations and life cycle maintenance costs
- ✓ **Cost savings of \$10,750,000**

contingent upon approval of other ATCs. However, ATC 12.2 has already been conditionally approved, without a resubmission requirement, by the Procuring Authorities.

## 2. Relevant RFP Requirements

This ATC proposes revisions to the requirements in Schedule 10, Table 8-5 to eliminate the need for the Onsite North Pond. This ATC is fully compliant with all other requirements of the Project Agreement.

Section 8.4.4.a.iv.D to Schedule 10 states:

*Hydraulic analyses and plans for Storm Drains that are connected to existing systems upstream or downstream of the Project shall be coordinated with affected Local Agencies. The hydraulic analyses shall cause no adverse impacts to the existing Storm Drain systems caused by the connections and proposed combined peak-design discharges for the overall systems.*

KMP's ATC will route flows from the I-70 Mainline within Project ROW into an existing 72 in. storm sewer that is owned by the City and County of Denver (CCD). The utilization of existing CCD storm sewer is a concept that is used throughout the Reference Design. For example, runoff from the I-70 Mainline is diverted un-detained into the existing 72 in. storm sewer in Grape St. (approximate Station 2125+00).

By incorporating approved ATC 12.2, KMP can use CCD's existing 72 in. storm sewer without adversely affecting the system. KMP has fully analyzed the system to confirm that adequate capacity exists, as shown below and on **Attachment A**.

- Eliminating the storm sewer bridge removes approximately 230 cfs from the system by diverting it to the west within the Offsite Outfall System.
- Our design connects the proposed storm sewer system within 46<sup>th</sup> Ave. North with the existing 72 in. storm sewer north of I-70 which incorporates 57 cfs to that system.
- The onsite drainage basin within the Lowered Section produces a 100-year peak runoff of 116 cfs, which will be diverted into the same existing 72 in. storm sewer in York St.
- In summary, KMP has added 173 cfs of flow to that system but has also eliminated 230 cfs. KMP's design will produce a net reduction to CCD's existing 72 in. storm sewer of 57 cfs compared to the Reference Design, allowing for future capacity, if needed.

Prior to entering CCD's existing 72 in. storm sewer pipe, flows will be routed to a new water quality pond for treatment. The pond will be designed per the required 1.55 acre-feet of Water Quality Capture Volume and will capture and treat runoff from the 80<sup>th</sup> percentile storm event. Flows above the 80<sup>th</sup> percentile storm event will bypass the water quality outlet control structure within the pond and be conveyed directly to a 42 in. outlet pipe and, subsequently, to CCD's existing 72 in. pipe.

## 3. Rationale

To provide drainage for the Lowered Section, the Reference Design's Onsite Outfall System uses an alignment which requires construction of a large diameter storm drain. Construction of the Reference Design will be inefficient, risky, and costly due to the depth of the storm sewer and the need for a high percentage of the pipe to be installed using jack and bore methods. Further, the construction activities associated with the Reference Design will cause multiple

impacts, such as intersection closures, to the Elyria/Swansea neighborhoods as well as business impacts at the outfall location.

KMP's alternate Onsite Outfall System alleviates all of the major concerns with the Reference Design's Onsite Outfall System by constructing the pump station and water quality pond directly adjacent to the Project within Project ROW. The proposed system provides an equal or better solution while:

- Eliminating approximately 3,900 LF of large, deep storm sewer upstream of the Onsite North Detention Pond and an additional 1,600 LF of 24 in. storm sewer downstream of the pond (total of 5,500 LF of storm sewer pipe eliminated);
- Eliminating the underground CBC detention vault, the Onsite North Detention Pond, and impacts to Eaton Sales and G&K Services;
- Eliminating the acquisition of ROW and Permanent Easements required for the Reference Design Onsite Outfall;
- Eliminating relocation of 60 in. Sanitary Sewer; and
- Eliminating a new outfall to the South Platte River

In accordance with the Project Agreement requirements, KMP intends to design, construct and install the necessary infrastructure required to drain the Lowered Section. The area tributary to the low-point includes the roadway and associated ramps within the Lowered Section.

Stormwater in the Lowered Section will be collected in a conveyance system at the low point of the alignment, near the Union Pacific Railroad crossing; between Brighton Blvd. and York St. The low point will drain to a wet well at the stormwater pump station at the corner of 46<sup>th</sup> Ave. North and York St. From the wet well, the water will be pumped into the water quality pond within Project ROW.

KMP's pump station design is fully compliant with the requirements of Section 8.4.5 of Schedule 10. Specifically, KMP's pump station design:

- Handles the runoff volume from a 100-year, two-hour event;
- Incorporates a wet well at the low point of the pump station with the maximum water level in the wet well more than one foot below the lowest pavement elevation of I-70;
- Contains debris screening at the inlet;
- Contains a total of six pumps which includes:
  - Four pumps of equal size, pumping capacity, and type for operational flexibility. These pumps have been sized such that three pumps would be required to handle the peak 100-year flow storm event. The fourth pump is included for redundancy in the event that one of the three main pumps is unable to operate. The use of identical pumps provides efficiencies such as the use of identical components and allows for alternating sequenced operations for the pumps to maintain even run times. This reduces maintenance and replacement costs.
  - Two low-flow pumps of equal size, pumping capacity, and type will operate during the majority of minor storms events. Only one of these pumps will be required for the majority of minor storm events. These pumps will also provide additional capacity and redundancy during major storms.

- Is based on slurry pumps that are commonly utilized in the mining and minerals industry and include high wire to water efficiencies as well as features to resist abrasion, wear and clogging;
- Includes explosion proof and corrosion resistant pump equipment and controls;
- Includes sensors and controls for alarming conditions on pumps, as well as water level within the wet well and upstream of the screen. Signals are routed back to the CTMC utilizing the Project wide fiber optic cabling;
- Contains fully redundant power supplies by using both a permanent primary power connection with the local utility provider and secondary power supplied by a backup emergency generator and automatic transfer switch. Each power supply will be sized to maintain a fully operational facility with the capacity to run all pumps, equipment and sensors necessary to accommodate the 100-year design flow;
- Provides access for all maintenance activities and minimizes the need for confined space entry;
- Is protected in a secure site and surface features adhere to the Project aesthetic guidelines.

KMP has considered and mitigated all the potential impacts associated with this ATC. Specifically, KMP has analyzed noise levels from the pump station and confirmed that levels will be below all Local Agency noise ordinances. The noise levels will be minor because the pumps are located well below the ground level within the wet well and utilize electric submersible motors. Additionally, the backup emergency generator will be provided with a sound attenuating enclosure and exhaust silencer.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** The proposed concept reduces schedule duration by optimizing the scope of work. The decreased schedule duration limits the exposure of risk inherently associated with construction activities to KMP's workforce and the public. Specifically, this ATC reduces several high risk utility crossings which drastically reduce risks to utility strikes.
- **Optimize the Scope:** This ATC will reduce the drainage infrastructure in the Reference Design by approximately 5,500 linear feet. The relocation of the pump station will also avoid numerous utility conflicts associated with the Reference Design. Scope will be further optimized through the elimination of the 60 in. RCP sanitary sewer relocation (DWWMD-SS-603 see Sheet 339 of the Drainage Plans) required by the Reference Design.
- **Optimize Operating and Life Cycle Maintenance Costs:** KMP understands the concerns associated with long-term operations and maintenance of a pump station. However, this concept has been closely coordinated with our O&M Team to provide the most cost-efficient solution from a lifecycle perspective. Further, the proposed concept provides a direct reduction of operating and life cycle maintenance costs by removing the need for long term maintenance of deep, large diameter storm sewer.



- **Minimize Impacts to the Traveling Public:** Relocating the pump station reduces the work in CCD streets which minimizes traffic impacts and the need for street occupancy permits. Impacts will be reduced, not only for vehicular traffic, but also for pedestrian and bike traffic within the Elyria/Swansea neighborhood.
- **Minimize Impacts to Businesses and nearby Communities during and after Construction:** This ATC stays within Project ROW and reduces potential impacts to future development under Denver’s “Corridor of Opportunity” vision planning. Additionally, this concept eliminates the impacts to Eaton Sales and Services and G&K Services that would be associated with the Reference Design.

## 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts.

Environmental impacts to the South Platte River will be reduced by utilizing an existing storm sewer outfall, whereas the Reference Design introduces a new outfall to the east bank of the South Platte River.

## 5. Cost and Benefits Analysis

The proposed ATC optimizes scope and reduces Project cost through:

- Elimination of the proposed Onsite North detention pond and associated ROW acquisition near the Riverside Cemetery, and CBC underground detention vault
- Elimination of 60 in. RCP sanitary sewer relocation
- Reducing pipe length: approximately 3,900 LF of 72 in. pipe and associated large, deep manholes; approximately 1,600 LF of 24 in. pipe and flap gate at South Platte River outfall
- Eliminating crossings of both the UPRR and BNSF

The total cost savings for the Project is estimated to be approximately **\$10,750,000**.

- **\$10,000,000:** capital cost savings through optimizing the scope
- **\$750,000 (\$25,000/year):** decreased maintenance costs by eliminating maintenance requirements for 5,500 LF of storm pipe
- **Department Savings:** the Department will realize additional savings due to the reduction in ROW acquisitions and the maintenance benefits associated with eliminating 5,500 LF of storm pipe

## 6. Schedule Analysis

This ATC does not significantly decrease the overall Project Schedule; however, the construction duration of the storm drain to the Onsite North Pond was anticipated to be 6-9 months. By eliminating the need for this construction, the impact the neighborhoods will be significantly reduced.

## 7. Conceptual Drawings

**Attachment A:** Optimized routing scheme for the offsite outfall system, onsite outfall system, and 46<sup>th</sup> Ave. North. It also notes the RFP drainage elements that are no longer required as a result of this ATC in combination with approved ATC 12.2.

**Attachment B:** Preliminary layout of the pump station and water quality pond adjacent to 46<sup>th</sup> Ave. North & York St.

**Attachment C:** Preliminary layout and configuration of the pump station.

**Attachment D:** Tracked changes to Section 8 of Schedule 10

## 8. Past Use

KMP team members have recently designed a similar stormwater pump station for the I-25 and Santa Fe Interchange Project. The design of this pump station was closely coordinated with CDOT and the UDFCD.

## C. Detailed ATC Requirements

### 1. Risks

There are no additional risks to the Procuring Authorities, CDOT, the State, or third parties associated with implementation of the ATC.

KMP recognizes that the Reference Design provides storage volume within the 72 in. storm sewer and underground detention vault, which provides emergency storage in the event of failure of the pump station during a major storm event. However, analysis shows that if the pump station failed during a 100-year event, the storm system between I-70 and the Onsite North Pond would fill to capacity in approximately 30 minutes. This would not provide adequate response time for a system located approximately one mile from the Project.

KMP's design mitigates the risk through redundancy in both the pump system itself and the power supply. Our design concept provides redundancy in the overall capacity of the pumping system. Having a total of 6 pumps of varying sizes provides operating flexibility across the full spectrum of flow events, and only 3 of the 4 larger pumps are needed to handle the full 100-year peak flow. There is also redundancy in the power system by providing an emergency backup generator in the event of a power outage in the primary feed. Additionally, the location of KMP's pump station facilitates a quick and efficient response time by maintenance staff in the event of emergency.

### 2. Handback

There are no negative changes in Handback procedures and/or the Handback Requirements associated with this ATC.

A significant benefit to the Department with this ATC is that all features received at Handback will be located immediately adjacent to the Project rather than at a location nearly a mile from the Project site.

### 3. Right-of-Way

No additional right-of-way is required to implement this ATC. This ATC eliminates the need for acquisition of one ROW parcel and nine Permanent Easements required for the Reference Design concept.

### 4. List of Required Approvals

There are no additional third party or Governmental Approvals, including any Design Exceptions, associated with this ATC.

### 5. Proposed Drafting Revisions

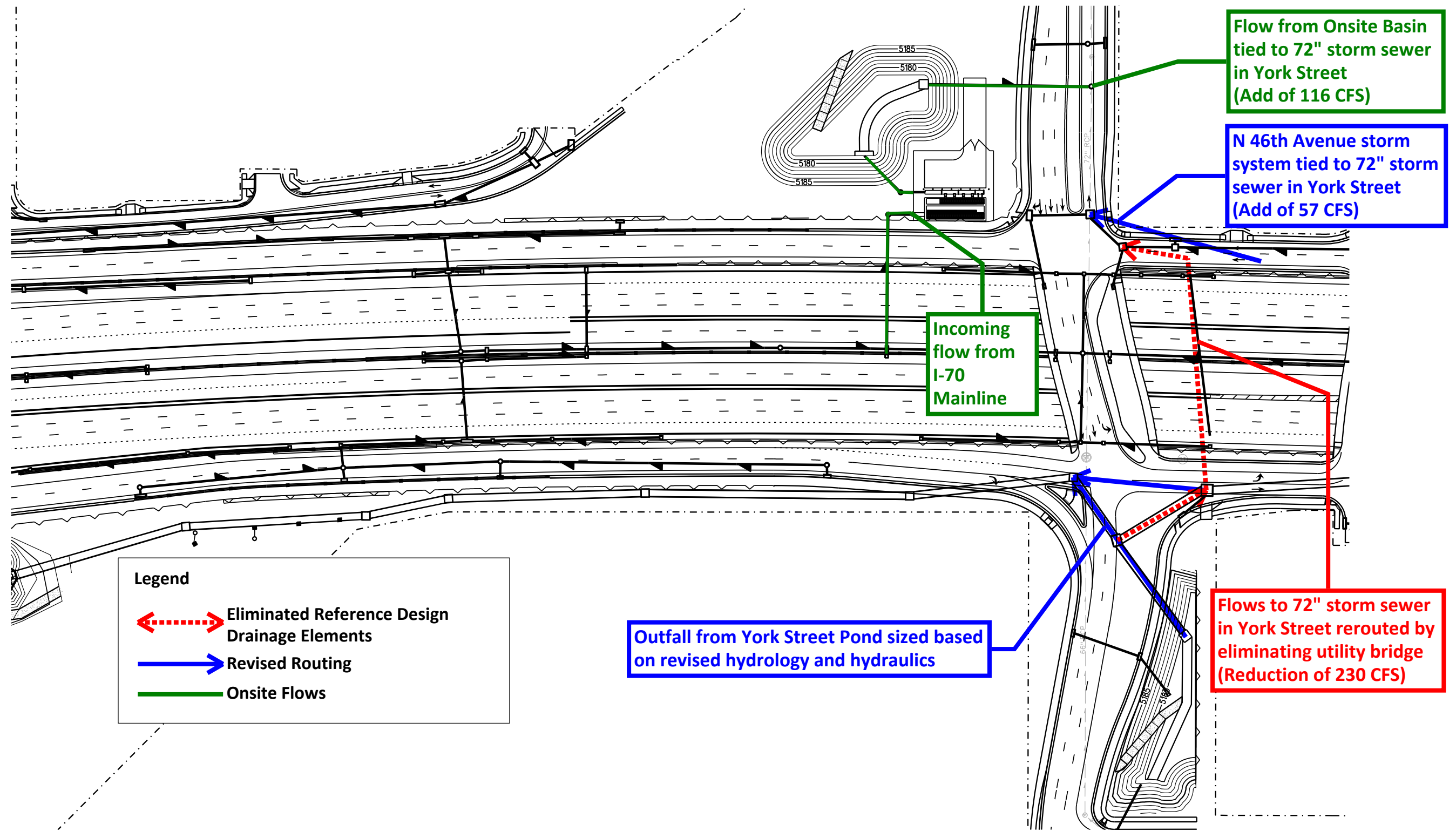
KMP has included the **Attachment D** with tracked changes for the changes in the section listed above

a) RFP Requirements that are Inconsistent with Proposed ATC

Schedule 10 Section 8 Table 8-5

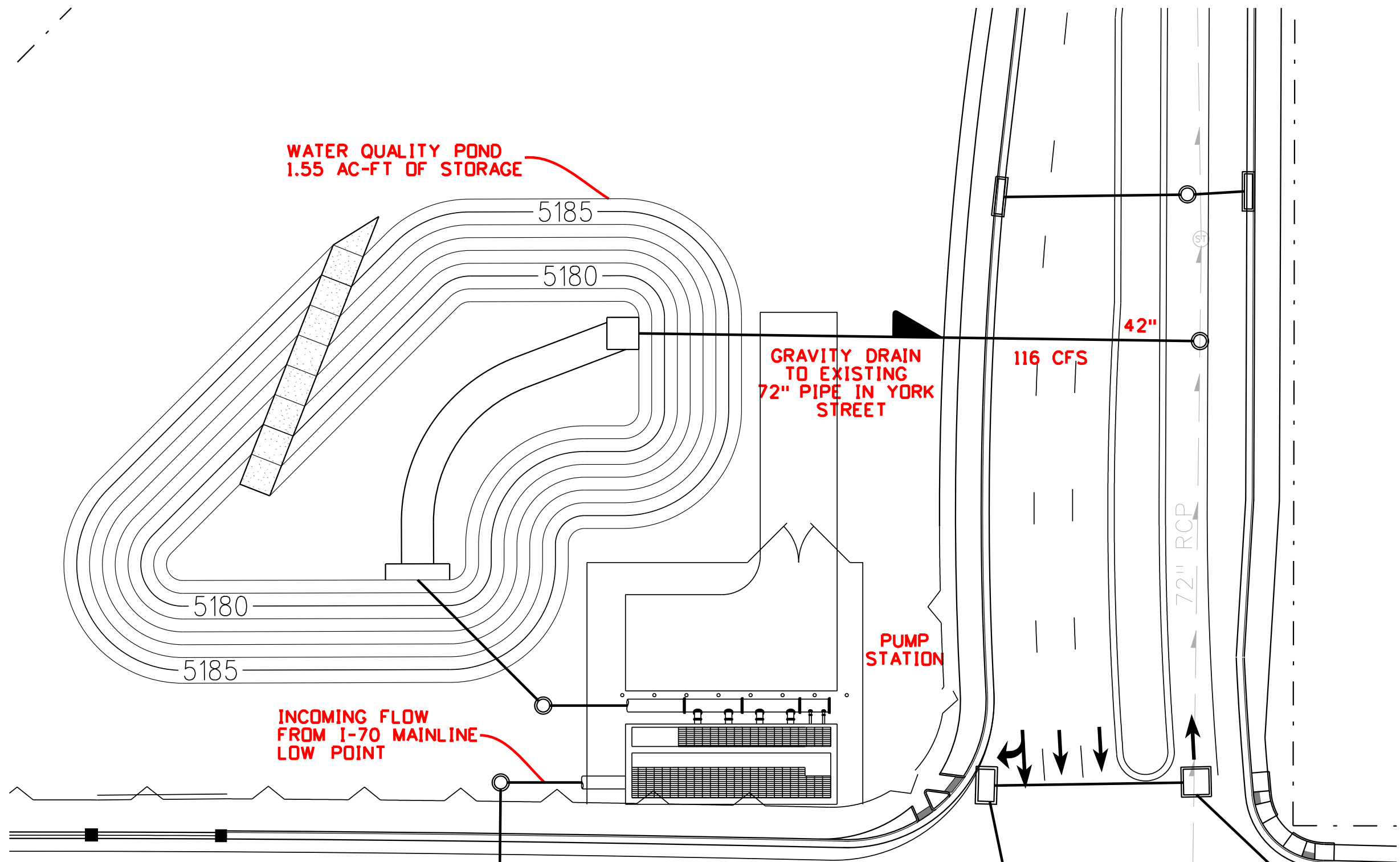
b) Proposed Revisions to address Inconsistencies

A copy of the proposed changes to the Project Agreement are attached.

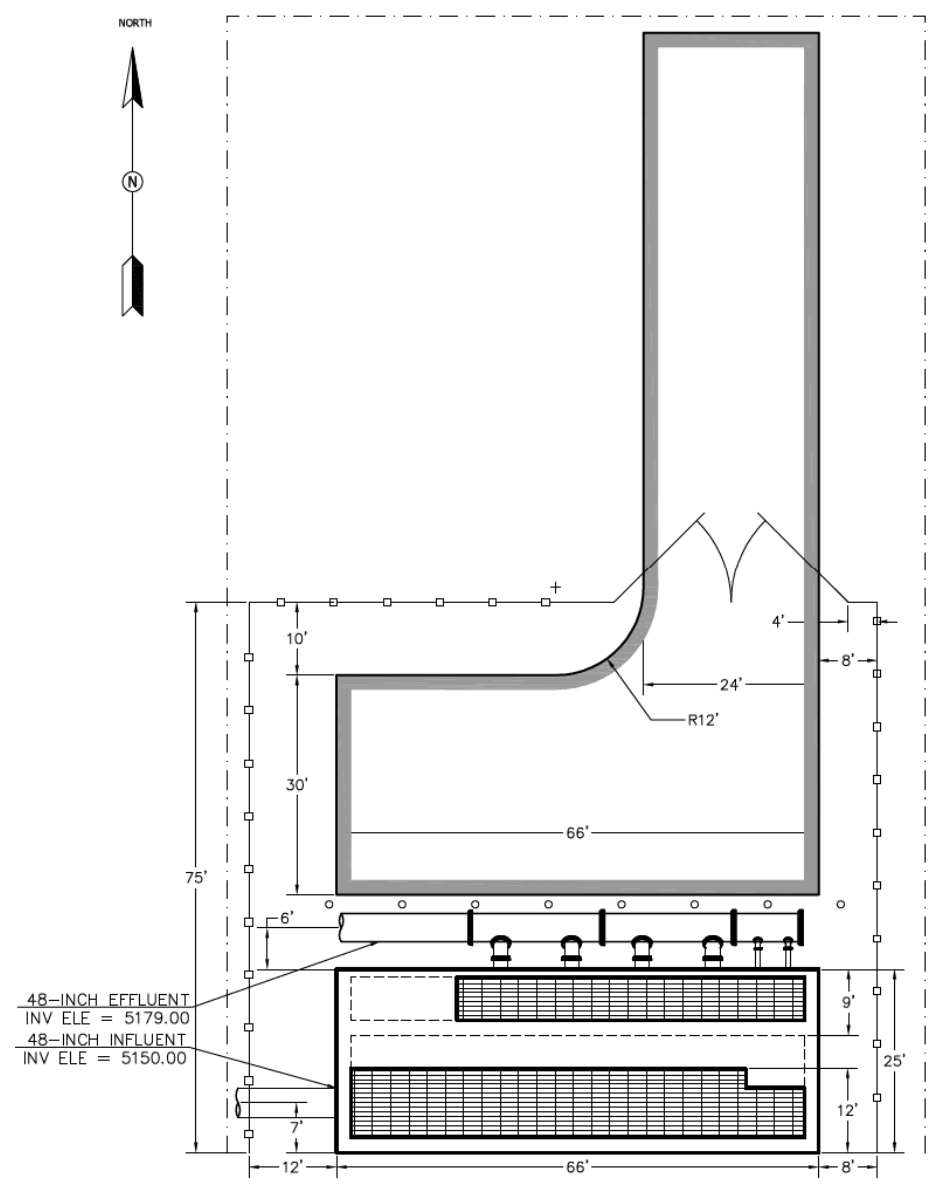


REFERENCE	SECTION	PAGE
B.2	RFP REQUIREMENTS	2
B.7	CONCEPTUAL DWGS	6

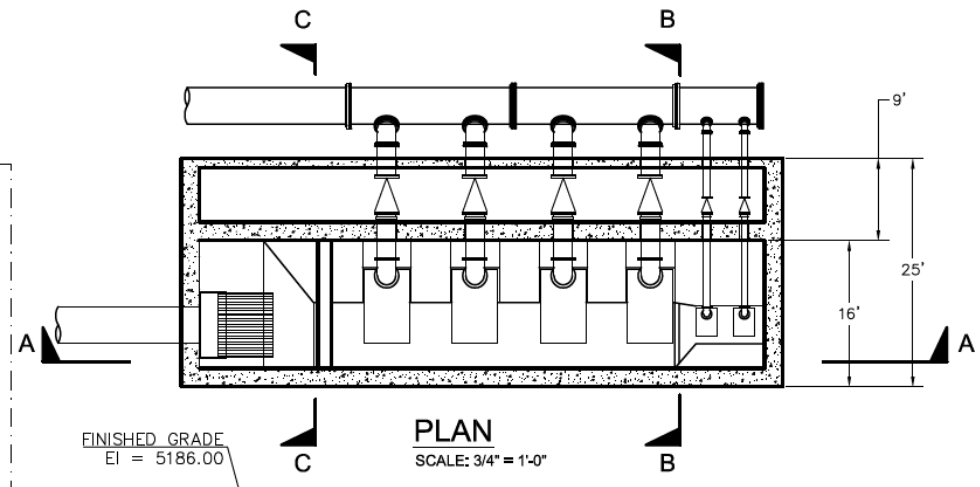




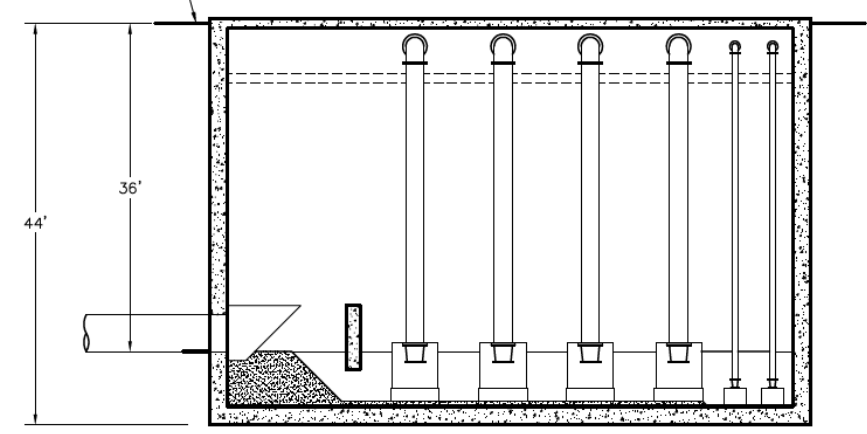
REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	6



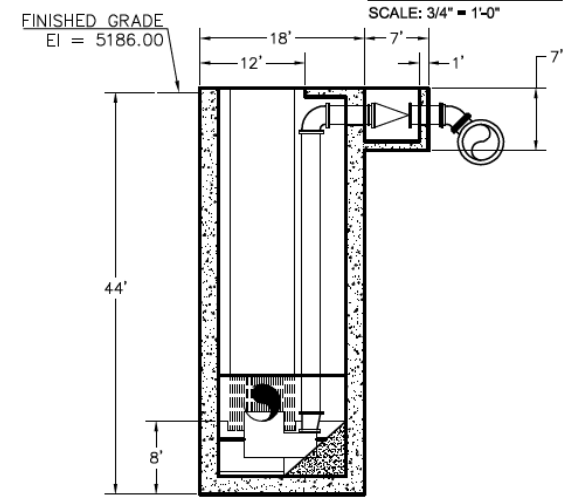
**SITE PLAN**  
SCALE: 1" = 20'-0"



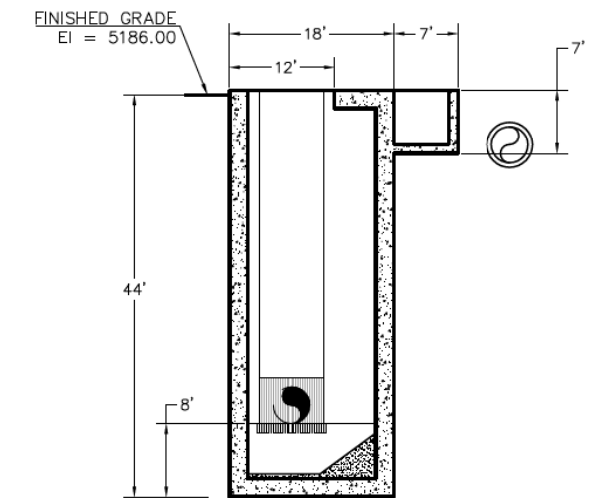
**PLAN**  
SCALE: 3/4" = 1'-0"



**SECTION A-A**  
SCALE: 3/4" = 1'-0"



**SECTION B-B**  
SCALE: 3/4" = 1'-0"



**SECTION C-C**  
SCALE: 3/4" = 1'-0"



REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	6

ALTERNATIVE TECHNICAL CONCEPT  
**Onsite Drainage Outfall**  
  
ATTACHMENT C

ATC NUMBER  
**68.0**  
  
SHEET NUMBER 1 OF 1

**Table 8-5 Water Quality and Detention Ponds**

Pond Name	I-70 Mainline Station	Facility Type
Brighton West	2000+00	Flood Control Pond
Brighton East	2012+00	Flood Control Pond
York East	2028+00	Flood Control Pond
Steele West	2050+00	Flood Control Pond
Steele East	2055+00	Flood Control Pond
Steele North	2055+00	Flood Control Pond
Colorado North	2080+00	Flood Control Pond
Colorado South	2080+00	Flood Control Pond
Quebec North	2185+00	Water Quality Pond
Havana North #1	2292+00	Water Quality Pond
Havana North #2	2292+00	Detention Pond
Havana South	2292+00	Water Quality and Detention Pond
Onsite North	<del>Race Court and Brighton Boulevard</del> <u>46<sup>th</sup> Avenue North and York Street</u>	Water Quality <del>and Detention</del> Pond

- v. All ponds shall include the following:
  - A. A six foot minimum width concrete trickle channel with mountable curb to convey nuisance flows from inflow locations to the primary low-level outlet and shall be designed for maintenance equipment loads;
  - B. Pre-sedimentation forebay and micro pool;
  - C. Outlet structure shall be flush with the side slope with trash rack;
  - D. Grades within the basin shall not be less than 0.5 percent unless otherwise Accepted by the Department;
  - E. Outfalls flowing into a pond shall be placed no less than 6 inches above the bottom of pond; and
  - F. Emergency spillway;
- vi. The Developer shall design and construct flood control ponds adjacent to the Lowered Section to capture and convey the 100 year flood before entering the I-70 Mainline. Flood Control Ponds shall not include the pre-sedimentation forebay and micro pool;
- vii. The Developer shall design and construct water quality and detention ponds to provide for the full WQCV plus the 10 year detention volume for the minor storm, and one-half of the WQCV plus the 100 year detention volume for the major storm event;
- viii. The Developer shall design and construct water quality ponds to provide for the full WQCV. Alternate PSQFs for water quality ponds, as shown in CDOT *Erosion Control and Stormwater Quality Guide*, may be used with Acceptance from the Department;
- ix. The Developer shall provide the following:



DATE: March 17, 2017  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito P.E. Central 70 Project Director  
Nicholas Farber, Central 70 Project  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 70.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 70.0 has been reviewed by the Procuring Authorities.

Detailed ATC 70.0 proposes to use an alternate light fixture for the mid-mast lighting on I-70.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required     Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).
- 5. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

The ATC is approved with the following conditions:

Conditions of approval:

- 1. As noted in the ATC submission, Xcel Energy is responsible for maintaining the mid-mast lighting. Currently, the fixture being proposed by KMP in this ATC is not approved by Xcel. KMP shall be responsible for getting approval from Xcel to maintain the proposed fixtures. If Xcel is unwilling to maintain the proposed fixtures, KMP shall be solely responsible for any and all costs associated with designing and constructing the lighting to the current RFP requirements.

The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to





Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.

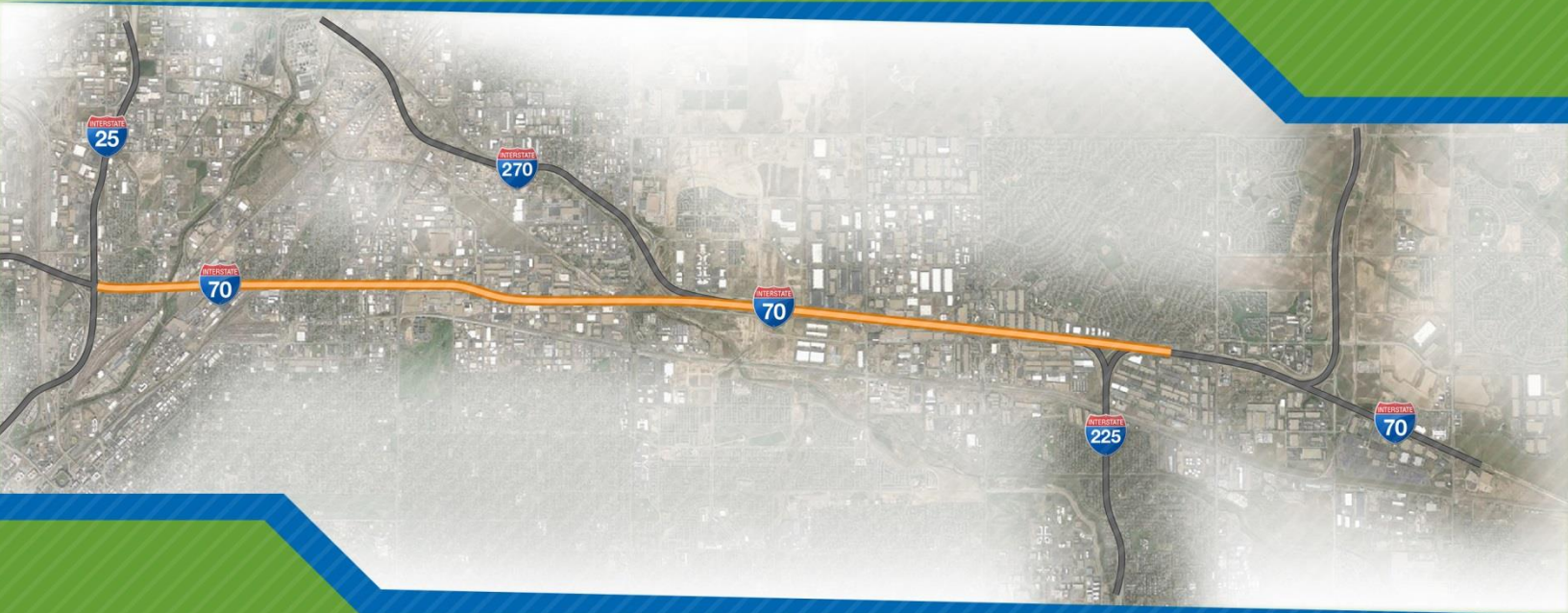




# Central 70 Project

Alternative Technical Concept Submission

ATC 70.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** March 10, 2017

**Central 70 Project RFP: ATC Submission No. 70.0**

**Alternate Roadway Lighting Fixture**

### A. Background Information

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### ATC 70.0 Benefits

- ✓ Equal or better performance and reliability
- ✓ Optimize the scope
- ✓ Optimize operations, and life cycle maintenance costs are reduced
- ✓ **Approximate cost savings of \$600,000**

### B. General ATC Submission Requirements

#### 1. Overview Description

Kiewit-Meridiam Partners (KMP) has analyzed the Project requirements to identify prudent solutions which provide equal or better functionality while decreasing Project cost. Through this analysis, KMP developed this ATC to provide equal roadway illumination while decreasing the required quantity of light fixtures by approximately 30%.

Section 11 to Schedule 10 of the Project Agreement (PA) prescribes that I-70 lighting design and construction be consistent with current Xcel Energy lighting standards. KMP is proposing an alternate median mid-mast light fixture to that prescribed by Xcel Energy for use on the Project. The proposed light fixture will still meet design photometric requirements in the PA; however, fewer fixtures will be required which will result in a more efficient, simpler to construct, and safer to maintain solution. KMP understands that approval of this design concept will require collaboration with Xcel Energy during final design.

#### 2. Relevent RFP Requirements

This ATC proposes revisions to the requirements in Schedule 10, Section 11.7.1.d and 11.7.2.a of the PA.



### 3. Rationale

KMP has reviewed the specifications of Xcel Energy's preferred light fixture for median mid-mast applications, Philips Lighting (RFL-241W112LED4K-T-R2M). To meet the photometric requirements in the PA, this fixture would limit the maximum spacing to approximately 368 ft. KMP has identified an alternate fixture, General Electric (ERS3-(mod-35)E1X40), which can meet the photometric requirements in the PA at a maximum spacing of approximately 500 ft. The increase in spacing results in an approximate 30% reduction in fixtures. The alternate fixture provides an average luminance of 0.4 candela per square meter (cd/m<sup>2</sup>) which is the same as Xcel Energy's preferred fixture. Further, the alternate fixture meets the uniformity criteria ensuring that no "hot spots" are created from using a higher wattage fixture.

KMP understands that this ATC would require coordination with Xcel Energy during final design. However, KMP has a high level of confidence that the alternate fixture, General Electric (ERS3-(mod-35)E1X40), will be acceptable to Xcel Energy. Currently, Xcel Energy allows General Electric fixtures with lower lumen outputs for this and other locations. The use of this alternate fixture would only require Xcel Energy to expand their offering to General Electric fixtures with higher lumen outputs.

Please note that this ATC only proposes to change the mid-mast median lighting. No change to ramp lighting, temporary lighting, or local street lighting is proposed.

This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** Decreasing the quantity of fixtures will minimize the exposure to inherent risks associated with installing and maintaining light fixtures.
- **Optimization of Scope:** This ATC will optimize scope through using an equal or better solution to deliver cost savings to the Project.
- **Optimization of the Life Cycle Maintenance Costs:** The proposed lighting system will result in lower long term maintenance costs by reducing the quantity of fixtures to be maintained and replaced.

### 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts.

### 5. Cost and Benefits Analysis

Preliminary estimates indicate that this ATC will result in a construction cost savings of \$500,000. Additionally, this ATC will decrease cost in the O&M term by approximately \$100,000.

**Total cost savings for this ATC is anticipated to be approximately \$600,000.**

### 6. Schedule Analysis

While localized construction durations will be reduced, there are no significant schedule savings anticipated with this ATC. Future maintenance activities will be reduced which will minimize impacts to the public during the Term.



## 7. Conceptual Drawings

N/A

## 8. Past Use

It is common industry standard for jurisdictions to allow the innovation in the selection of lighting and other similar equipment as long as a minimum criteria is met. General Electric fixtures, similar to the alternate proposed in the ATC, are currently offered with Xcel Energy's LED catalog. This ATC proposes to allow KMP to work with Xcel Energy during final design to expand the Xcel LED offering to include higher lumen output fixtures. General Electric fixtures are dependable devices used in a wide variety of roadway applications including freeway lighting, local streets and tunnels throughout the United States.

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State, or third parties associated with implementation of the ATC.

### 2. Handback

There are no negative changes in Handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional right-of-way is required to implement this ATC.

### 4. List of Required Approvals

This ATC will require approval of the alternate fixture by Xcel Energy.

### 5. Proposed Drafting Revisions

#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for the exclusive use by KMP upon acceptance of this ATC.

1. Section 11.7.1.d of Schedule 10 of the PA
2. Section 11.7.2.a of Schedule 10 of the PA

#### b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment A** with tracked changes for the changes in the section listed above.



# Central 70 Project

Attachment A – Tracked Changes to Section 11 of Schedule 10

ATC 70.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

March 10, 2017



warning signing and beacons shall be added on Brighton Blvd. northbound, Colorado Blvd. northbound, Quebec St. northbound and Peoria St. northbound. Final locations to be Approved by the Department. Schedule 10, Section 11, Appendix A Revision of Section 614 - Microwave Presence Detector shall be applied for ramp metering detection on a bridge structures.

## 11.7. Lighting

### 11.7.1. Lighting Design

- a. Prior to the issuance of NTP 2, the Developer shall submit an inventory of all existing lighting affected by the Construction Work, in MicroStation format, to the Department for Acceptance. The report shall indicate if each individual light is working or not working during night time conditions. The report shall also include the lighting circuitry within the Site;
- b. The Developer shall prepare mid mast median lighting design for the I-70 Mainline between Brighton Boulevard and Chambers Road including the transition into the existing vector lighting from I-25 to Brighton Boulevard, and into the existing high mast interchange lighting at I-225/I-70. New high mast lighting shall not be permitted. If necessary Developer shall provide additional lighting on the I-70 Mainline shoulders to comply with relevant requirements of Schedule 10, Section 11;
- c. The Developer shall prepare pedestrian lighting designs on both north and south 46<sup>th</sup> Ave from Brighton Blvd. to Milwaukee Street, York Street, Local Agency Roadways over I-70 Mainline and the Cover;
- d. Lighting design shall include ramps, sidewalks, Local Agency Roadways, highways arterials, parks, pedestrian, bike and take into consideration all existing permanent lighting conditions on roadways impacted by the Construction Work. The design shall cover both temporary and permanent lighting. Details shall include existing topography, ROW, Utilities and drainage facilities, structures, all existing and proposed facilities, location and orientation of standards and fixtures, wiring, conduits, pedestals, power sources, and all other lighting components as required;
- e. Unless otherwise approved, Ppermanent lighting shall be designed and constructed to be consistent with current CDOT *M-Standard Plans*, Xcel Energy lighting standards, DPS lighting standards, and CCD lighting standards, as applicable;
- f. Existing lighting impacted by the Construction Work shall be replaced to include complete interchange lighting or partial interchange lighting within the Site and Local Agency Roadways;
- g. The lighting design submittal shall include lighting calculations for both permanent and temporary conditions. Design details shall include lighting calculations and electrical design including voltage-drop calculations for each circuit to Xcel Energy for approval prior to the installation of the wiring for the connections to the power sources; and
- h. New lighting underneath structures shall be placed where a lane closure is not required for maintenance. Existing lighting under structures shall be re-set to a location where a lane closure is not required for maintenance. Both of these requirements for existing and new lighting shall also meet the photometrics regarding design.

### 11.7.2. Lighting Materials

- a. Unless otherwise approved, tThe Developer shall use lighting equipment for all permanent installations as specified in the CDOT *Standard Specifications*, by Xcel Energy, DPS, or CCD, as applicable;
- b. The Developer shall obtain approval of the lighting equipment from the Local Agency responsible for maintenance; and



DATE: April 14, 2017  
TO: Kiewit-Meridiam Partners (KMP)  
FROM: Anthony DeVito, P.E. Central 70 Project Director  
Keith Stefanik, P.E. Central 70 Deputy Director of Project Delivery  
SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response  
Kiewit-Meridiam Partners - ATC No. 71.0

Dear Mr. Dionisio:

Your Team's ATC Submission Form for Detailed ATC 71.0 was reviewed by the Procuring Authorities prior to the April One-on-One Meetings and an initial response was sent to you on April 7, 2017. As discussed during the April One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

Detailed ATC 71.0 proposes to revise the requirements for the standpipe system associated with the roadway Cover structure.

In accordance with the Instructions to Proposers ("ITP"), the Procuring Authorities will use reasonable efforts to provide a Proposer with the following written feedback on a ATC Submission within 15 Working Days following the later of (x) the date the relevant ATC Submission was submitted and (y) the One-on-One Meeting at which such submission is discussed. Below is the final response from the Procuring Authorities for your Detailed ATC:

- 1. unconditional approval;
- 2. conditional approval, subject to modifications and/or conditions;  
 Re-submission required       Re-submission not required
- 3. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;
- 4. notification that the incorporation of the proposed ATC in the Proposer's Proposal is already permitted under the terms of the RFP, and therefore does not qualify as an ATC (and will not be treated as such for purposes of Section 3.4 of Part C of the ITP).
- 5. subject to compliance with the confidentiality requirements set out in Section 3.4 of Part C of the ITP, the Procuring Authorities are considering amending (for the benefit of all Proposers) the terms of the RFP that are the subject-matter of the proposed ATC.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Detailed ATC Submission. The ATC is approved with the following conditions:

Conditions of approval:

- 1. The Developer shall solely be responsible for any Governmental Approvals required to implement this ATC. In particular, approval from the AHJ will be required.





The approval of this Detailed ATC by the Procuring Authorities does not constitute an approval of specific drafting modifications to the RFP necessary to incorporate this ATC into the Project Agreement pursuant to Section 7.2.1.c of Part C of the ITP, which modifications shall be agreed by the Procuring Authorities and the Proposer (each acting reasonably) following issuance of a Notice of Award to such Proposer.





# Central 70 Project

Alternative Technical Concept Submission

ATC 71.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission



## ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

**Proposer Name:** Kiewit-Meridiam Partners

**Date:** March 24, 2017

**Central 70 Project RFP: ATC Submission No. 71.0  
Alternate Cover Standpipe System Requirements**

**A. Background Information**

1. Type of Submission
  - Conceptual ATC
  - Detailed ATC
2. Prior Submission
  - None (initial submission of ATC)
  - Previously Submitted as Conceptual ATC
  - Previously Submitted as Detailed ATC
3. Explanation of Reason for Resubmission  
N/A
4. Request for Discussion at One-on-One Meeting
  - Meeting Requested
  - Meeting Not Requested

### ATC 71.0 Benefits

- ✓ Equal or better performance and reliability
- ✓ Optimize the scope
- ✓ Optimize operations and life cycle maintenance costs
- ✓ **Approximate cost savings of \$600,000**

**B. General ATC Submission Requirements**

**1. Overview Description**

In an effort to provide the Procuring Authorities with an optimized and cost effective design solution, Kiewit-Meridiam Partners (KMP) proposes to revise the requirements for the standpipe system associated with the roadway Cover structure. The purpose of this ATC is to propose an NFPA 502 compliant standpipe system design that is commensurate with the fire protection needs for the roadway Cover structure as well as the long term maintenance goals of the Project.

KMP proposes to provide a single standpipe system designed to service both the eastbound and westbound bores. Service to both bores using a single standpipe will be achieved by locating a series of fire department hose connection stations along the center wall (and at each cross bore door) that can be easily accessed by fire fighters from either bore depending on the location of the fire incident. This alternative standpipe system design concept is proposed in lieu of the Project Agreement (PA) requirement which prescribes two separate standpipe systems, one for the eastbound bore and one for the westbound bore. The proposed design consists of valve-controlled cross-connections between the two systems and fire hose connections on both walls within each bore.

KMP's proposed code compliant alternative design concept will provide significant initial and life-cycle cost savings for the Project and will result in a more efficient standpipe system capable of providing long term reliability and functionality.

KMP understands that approval of this design concept will require collaboration with the Authority Having Jurisdiction (AHJ). The concept was previously discussed with the AHJ during the One-on-One Denver Fire Topic Meeting on January 25, 2017. The outcome of those discussions are reflected in the body of this ATC. KMP also acknowledges the requirement to coordinate with the AHJ during the final design phase of the Project.

## 2. Relevent RFP Requirements

This ATC proposes revisions to the requirements in Schedule 10, Section 12.20.3b (Standpipe, Hydrants and Portable Fire Extinguishers) of the PA.

## 3. Rationale

The purpose of this ATC is to provide an optimized, code compliant standpipe system design that is appropriate for the fire protection coverage needs of the Cover structure.

The proposed alternative design is a single semi-automatic (normally dry) standpipe system connected to the municipal water supply system with activation capability available remotely from the CCMS and locally at both Cover portals. The proposed system consists of a single standpipe main mounted along the center wall of the westbound roadway above and outside the clearance envelope. The single standpipe main would feed five fire hose valve cabinets equally spaced and accessible within the Cover from both the eastbound and westbound roadways (a total of ten fire hose connections).

The proposed alternative concept provides a lower cost, lower maintenance standpipe system that complies with the intent of the PA and meets all performance and design requirements per the governing codes NFPA 502 and NFPA 14.

The requirements in the PA infer that the standpipe system is to consist of two, independent standpipe systems, one in each bore, that are cross-connected via a series of isolation control valves at each of the three cross-bore door locations. KMP interprets this requirement as a provisional means of redundancy that would allow for the isolation of sections of either standpipe system for repair purposes while maintaining system availability to other areas of the roadway within the Cover.

Based on past experience with dry standpipes systems in similar road tunnel facilities, repair activities that take the system out of service are extremely rare occurrences. In fact, in the few known cases of dry standpipe system failures in road tunnels, the cause of failure is consistently attributable to freeze damage resulting from improperly drained pipes. As such, these rare occurrences caused by improper maintenance do not warrant the need for the full system redundancy as implied in the PA.

In the event of periodic service or repairs, other options are available that do not require a separate redundant system. Isolation of sections of a single pipe system can be achieved by the installation of manually operated isolation valves at discreet points along the main header. This allows short segments of the system to be taken out of service while leaving the rest of the system operational. The same isolation can also be achieved by capping pipe ends at points where repairs will take place. This section isolation can be performed in a matter of minutes on an easily accessible, grooved-coupling pipe system such as that proposed here.

These alternatively proposed isolation methods for standpipe system repairs and service are common practice in road tunnels. It should also be noted that NFPA standards for road tunnels



do not require the availability of all sections of standpipe systems during maintenance operations.

This single standpipe system alternative with hose connection stations positioned along the center wall to service both bores was presented as part of our overall fire protection system approach and concept discussion with the AHJ during our One-on-One Meeting on January 25, 2017. At the meeting, the AHJ did not indicate any concerns with this concept approach of a single standpipe system serving both bores.

For the reasons stated above, this ATC proposes a single standpipe header that will service both bores and be easily accessed, repaired and maintained. This ATC directly aligns with the following Project Goals:

- **Protect the Safety of the Workforce and Public:** KMP is committed to protecting the safety of the workforce, public, and first responders. The proposed ATC would not be pursued if it were not fully in compliance with current codes and best practices and did not provide a reliable fire life safety system.
- **Optimization of Scope:** This ATC will optimize scope through meeting the Project Goals and requirements while reducing construction costs.
- **Optimization of the Life Cycle Maintenance Costs:** The proposed standpipe system offers a less complex standpipe system that will result in reduced annual testing time and long term maintenance costs
- **Minimize Impacts:** This ATC results in a reduction of the spatial area required for the standpipe system and replaces complex piping and valve arrangements with a simplified design.

## 4. Impacts

This ATC does not present any potential adverse safety, environmental, social, economic, community, traffic, operations and maintenance, or third party impacts.

## 5. Cost and Benefits Analysis

Preliminary estimates indicate that this ATC will result in a construction cost savings of approximately \$300,000. Additionally, this ATC will decrease cost in the O&M Term by another \$300,000.

**Total cost savings for this ATC is anticipated to be approximately \$600,000.**

## 6. Schedule Analysis

While localized construction durations will be reduced, there will be little if any significant schedule savings to the overall Project. Significant savings in the routine maintenance schedule will be realized from the implementation of this ATC.

## 7. Conceptual Drawings

**Attachment A:** Proposed Standpipe schematic diagram.

**Attachment B:** Tracked changes to Schedule 10 Section 12 of the Project Agreement

## 8. Past Use

This proposed alternative standpipe system design has been implemented successfully in road tunnels internationally. KMP acknowledges that compliance with NFPA 502 requires that each road tunnel facility must be evaluated for appropriate fire protection and life safety features that meet its unique needs as well as the requirements and approval of the local AHJ. This ATC will provide a standpipe system design that is appropriate for the proposed Cover structure and is anticipated to be accepted by the AHJ.

## C. Detailed ATC Requirements

### 1. Risks

There are no changes or additional risks to the Procuring Authorities, CDOT, the State, or third parties associated with implementation of the ATC.

### 2. Handback

There are no negative changes in Handback procedures and/or the Handback Requirements associated with this ATC.

### 3. Right-of-Way

No additional right-of-way is required to implement this ATC.

### 4. List of Required Approvals

This ATC will require approval of the AHJ. There are no other additional third party or governmental approvals, including any design exceptions, associated with this ATC.

### 5. Proposed Drafting Revisions

KMP has included the **Attachment B** with tracked changes for the proposed revisions to the PA Section listed above.

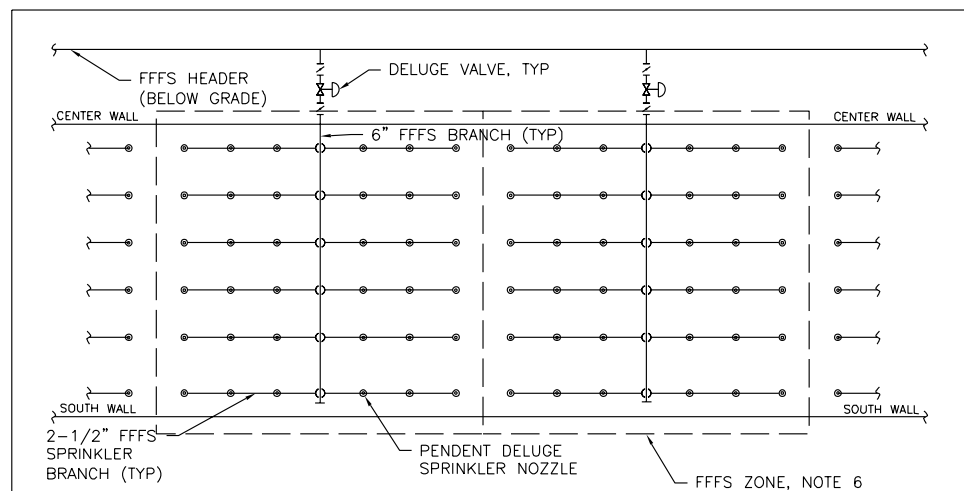
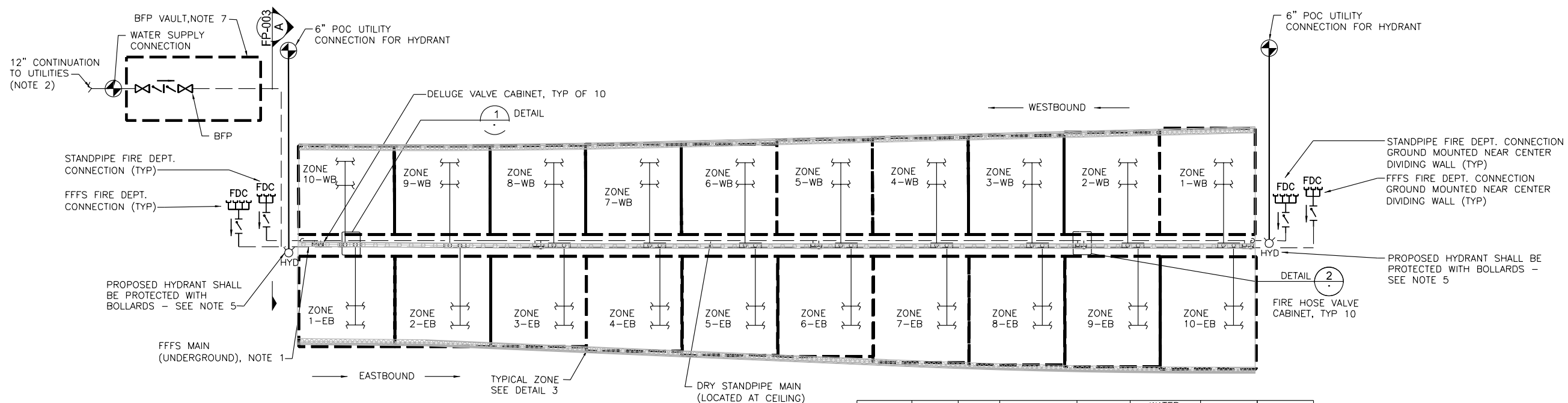
#### a) RFP Requirements that are Inconsistent with Proposed ATC

KMP requests that the following sections be revised for the exclusive use by KMP upon acceptance of this ATC.

1. Section 12.20.3b of Schedule 10 of the PA

#### b) Proposed Revisions to address Inconsistencies

KMP has included **Attachment B** with tracked changes for the changes in the section listed above.



DETAIL 3  
TYPICAL FFFS ZONE

ZONE OPTION	ZONE LENGTH	TOTAL ZONE QTY	ACTIVATED ZONES DURING EVENT	COVERAGE AREA, SQFT	WATER APPLICATION RATE (GPM/SQFT)	STANDPIPE DEMAND (NOTE 8)		FFFS DEMAND (NOTE 3,4)	
						GPM	PSI	GPM	PSI
PA REQ.	100 FT	20	2	20000	0.15	750	100	3750	7.8

MATERIAL TAKE-OFF\*

COMPONENT	QUANTITY	LENGTH (ft)	MATERIAL
8" FFFS DELUGE VALVE ASSEMBLY	20		
6" STANDPIPE DELUGE VALVE ASSEMBLY	1		
10" BACK FLOW PREVENTERS	1		
FFFS DELUGE VALVE CABINETS	10		STAINLESS STEEL
FFFS FIRE DEPARTMENT CONNECTION (4 WAY)	2		
12" FFFS MAIN PIPING		1400	DUCTILE IRON
8" FFFS ZONE SUPPLY PIPING		200	DUCTILE IRON
6" BRANCH PIPING		2000	SCHEDULE 40, HOT DIPPED GALV.
2-1/2" BRANCH PIPING		12000	SCHEDULE 40, HOT DIPPED GALV.
HEAT TRACING (W/INSULATION)- 6" PIPE		200	
PENDENT DELUGE SPRINKLER NOZZLES	720		
FIRE HOSE VALVE CABINETS WITH EXTINGUISHERS	10		STAINLESS STEEL
STANDPIPE VALVE CABINET	1		
FIRE HOSE VALVES	20		
6" STANDPIPE MAIN PIPING		1400	SCHEDULE 40, HOT DIPPED GALV.
FIRE HYDRANTS	2		CITY OF DENVER STD.
4" STANDPIPE BRANCH PIPING		200	SCHEDULE 40, HOT DIPPED GALV.
FIRE DEPARTMENT STANDPIPE CONNECTION (3 WAY)	2		
1" AIR RELEASE/VACUUM VALVE	2		

NOTES:

\* QUANTITY, SIZE AND LENGTH ARE BASED ON CONCEPTUAL DESIGN SHOWN. PROPER CONTINGENCIES SHALL BE INCLUDED IF USED FOR PRICING.

- FIXED FIRE FIGHTING SYSTEM (FFFS) SUPPLY PIPING IS PROPOSED TO BE BURIED BELOW ROADWAY GRADE TO REDUCE HEAT TRACING REQUIRED.
- THE REQUIRED WATER SUPPLY FOR THE FFFS IS BASED ON A 12" SINGLE WATER SUPPLY CONNECTION TO THE PROPOSED CIVIL CONNECTION TO THE 36" TRANSMISSION LINE AT THE WEST PORTAL.
- DELUGE SYSTEM WATER DEMAND APPLIES A 1.25 EFFICIENCY FACTOR.
- MINIMUM PRESSURE FOR THE MOST REMOTE ZONE AND NOZZLE
- STANDPIPE AND DELUGE FDC'S ARE TO BE LOCATED WITHIN 100 FEET FROM MUNICIPAL HYDRANTS.
- LAYOUT IS SHOWN AS A SCHEMATIC. FINAL DESIGN LAYOUT WILL CONSIDER OBSTRUCTIONS, CEILING AND BEAMS.
- LOCATION OF 10" BACKFLOW PREVENTER (BFP) TBD. UNDERGROUND VAULT SIZED TO 7'W X 11'L X 8'D. VAULT SHALL INCLUDE MAINTENANCE ACCESS.
- STANDPIPE DEMAND BASED ON NFPA 502 SECTION 10.1.1 IN REFERENCE TO NFPA 14 SECTION 7.10.1.1.2
- ADDITIONAL STANDPIPE COVERAGE BEYOND TUNNEL PORTALS WILL BE REQUIRED BY THE AHJ WHERE ROADWAYS ARE DEPRESSED (BELOW GRADE) HIGHWAY IS CONSIDERED LIMITED ACCESS PER NFPA 502 SECTION 4.3.5.
- SEE SHEET NO. E-009 FOR ORIENTATION OF FIXED FIRE FIGHTING AND STANDPIPE SYSTEM COMPONENTS WITH OTHER MEP ELEMENTS WITHIN COVER CROSS SECTION.



REFERENCE	SECTION	PAGE
B.7	CONCEPTUAL DWGS	3

ALTERNATIVE TECHNICAL CONCEPT  
Cover Standpipe Requirements

ATTACHMENT A

ATC NUMBER  
71.0

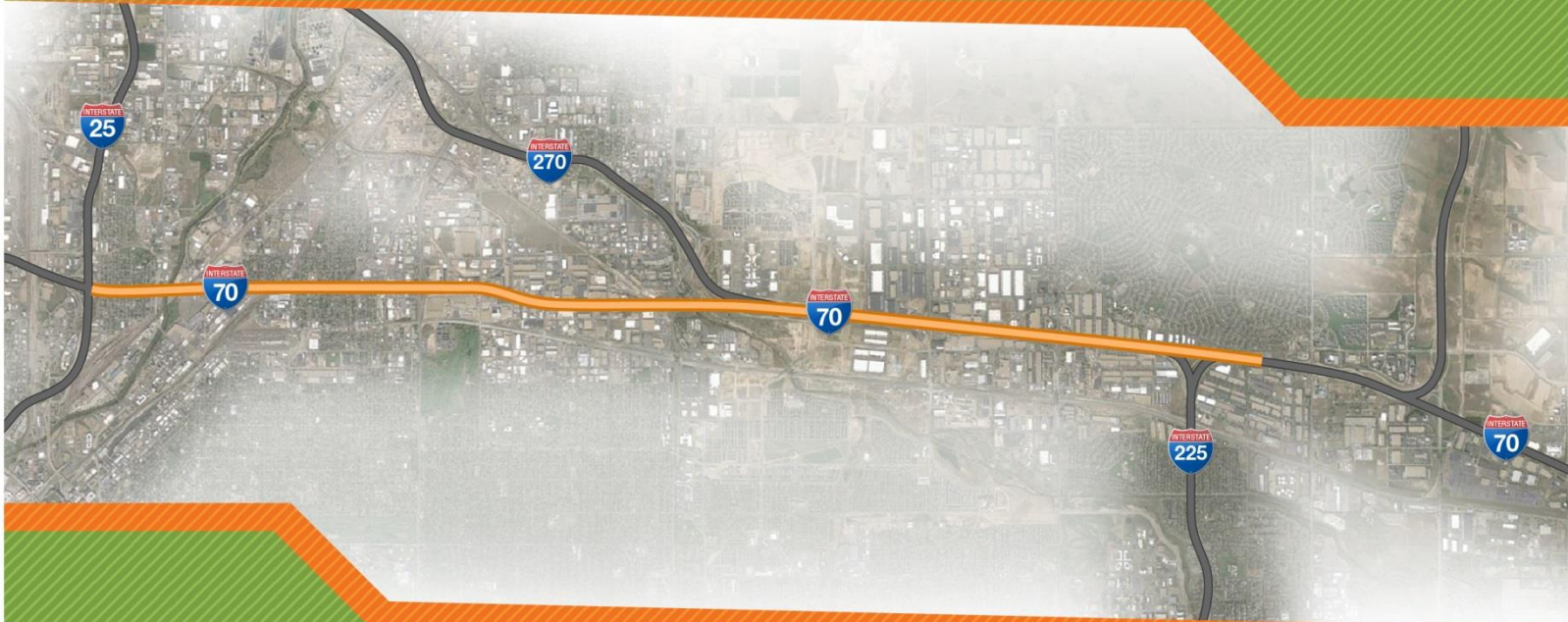
SHEET NUMBER 1 OF 1



# Central 70 Project

Attachment A – Tracked Changes to Section 12 of Schedule 10

ATC 71.0



Submitted to:  
Colorado Bridge Enterprise  
High Performance Transportation Enterprise  
c/o Colorado Department of Transportation



Detailed ATC Submission

March 24, 2017



**Table 12-3 Lighting Control System Interfacing**

System	Interface	Managing system
Ventilation	None	
Drainage	None	
Lighting	N/A	N/A
Fire main	None	
Fixed firefighting system	None	
Portal Photometer system	Dimming input via analogue system to CCMS and then digital signals to the lighting control system	CCMS linking photometers to Lighting control system
Emergency way-finding system	Testing and monitoring of system status	Lighting control system with status signal via CCMS
Radio rebroadcast systems	None	
Voice alarm public address system	None	
AID system	Go to incident lighting scene	Signal via CCMS
FDAS system	Go to incident lighting scene	Signal via CCMS
Plant Room systems	None	
Power distribution system	None	

**12.20. Standpipes, Hydrants and Portable Fire Extinguishers**

12.20.1. Scope

The Developer shall design and install standpipes, hydrants and portable fire extinguishers to provide coverage the full length of the Cover, which shall be available in the event of a fire in the Cover to be used to extinguish or suppress the fire.

12.20.2. Basis of design

The Developer shall design, provide, install, test and commission the FFFS and all fire suppression systems in accordance with the Construction Standards and the requirements of the AHJ. The Developer shall allow for all performance testing and demonstrations to the Department and relevant authorities or appointed representatives. The Developer shall undertake all necessary surveys and investigations to validate the design including, but not limited to Utility surveys, investigations, enquiries with relevant bodies and for obtaining all necessary Permits, approvals and consents.

12.20.3. Design Criteria – Standpipes

- a. The Developer shall design, provide and install all valves, connections, hangers, inserts, piping, sleeves, fittings, and other appurtenances necessary to provide a fully functional and compliant standpipe system.
- b. ~~Standpipes shall be provided in both the eastbound and westbound bores and located in similar locations in each bore at each cross bore door and on the opposite wall. The piping shall be cross connected at cross bore door locations such that either bore can be supplied by either main.~~ Isolation valves shall be provided between hose valve stations to enable sections of the system to be shut down for maintenance without shutting the entire system down. Standpipe hose connection stations shall be located along the center wall of each bore and at A hose connection shall be provided at each cross bore door, in each bore, located adjacent to the door.
- c. The standpipe system shall be a dry pipe system supplied from the municipal water company mains supply. Dry pipe system shall be manually filled from the water supply (with automated control via the CCMS to be provided as a backup). Outside of the Cover

limits, within the limits of the Lowered Section, automated backup control is not required. The Developer shall conduct testing in accordance with NFPA 14 to determine that the supply is capable of supplying the system demand for a minimum period of one hour and of delivering water to all hose connections on the system within 10 minutes or less. In the event that tests indicate that the supply is not capable of meeting the system demands, the Developer shall provide suitable pumping equipment to maintain system pressures.

- d. The required flow rate shall be 750 gpm at the hydraulically most demanding outlet. Allowance shall be made for two hydrants operating simultaneously. The calculation procedure shall be in accordance with section 7.10.1.2.2 of NFPA 14 or in accordance with the requirements of the AHJ. The minimum residual pressure at the hydraulically most remote 2.5 inch outlet shall be 100 psi. Pressure restricting valves shall be provided where the hydraulic head exceeds 100 psi.
- e. Standpipes shall be Class 1 dry type system as defined by NFPA 14 subject to the agreement of the AHJ. A temporary or permanent standpipe system shall be installed and tested during the construction phase in accordance with NFPA 14, NFPA 25, NFPA 502 and NFPA 241 and to the requirements of the AHJ.
- f. Hose connection spacing shall be such that that no location within the protected area is more than 150 feet from the hose connection. Hose connection spacing shall not exceed 275 feet.
- g. The entire standpipe system including valves shall be protected against freezing and shall be complete with all necessary status monitoring and alarms linked to the CCMS system.
- h. The standpipe system shall be suitably protected from mechanical damage and vandalism.
- i. Suitable back flow prevention devices shall be installed to prevent contamination of the Water Company supply and distribution system.
- j. The standpipe system shall be provided with drain points to enable the entire system to be drained down.
- k. The pipework system shall be protected from unequal settlement or structural movement by the use of appropriate flexible jointing couplings.
- l. Suitable fire collars shall be provided where piping passes through fire rated structure.
- m. A two way Siamese coupling shall be provided at both ends of each bore to allow the Fire Department to provide backup water supplies, the location of these connections shall be agreed with the Fire Department. The Developer shall provide all fire hydrants and associated piping.
- n. "Standpipe Connection Stations" with hose connections shall consist of a protective enclosure that also houses portable fire extinguishers. Each standpipe connection station shall have two, 2.5 inch, hose connections with an external thread in accordance with NFPA 1963 or as otherwise required by the Fire Department. The standpipe connection station cabinets shall be located in recesses ~~in the side walls of the Cover~~ to finish flush with the wall surface.
- o. The Developer shall provide an appropriate signage system in accordance with NFPA 14 and to the approval of the Fire Department.

#### 12.20.4. Design Criteria - Portable fire extinguishers

- a. Portable fire extinguishers shall be provided in accordance with NFPA 502 with a rating of 2-A: 20-B: C and shall be located along the Cover of both the Eastbound and Westbound bores. They shall be co-located in approved standpipe connection stations and at intervals of not more than 300 feet. The maximum weight of the extinguishers shall