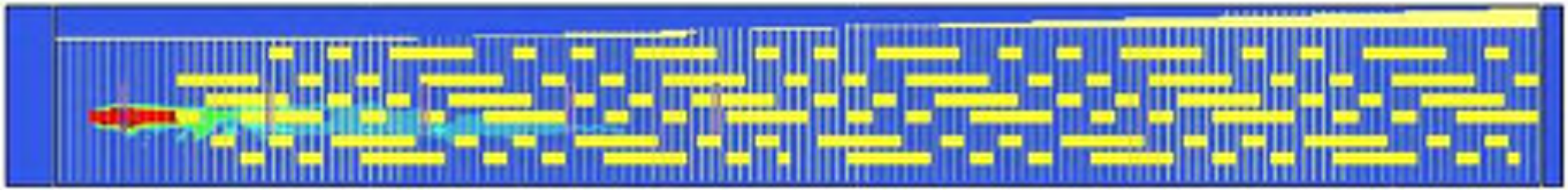

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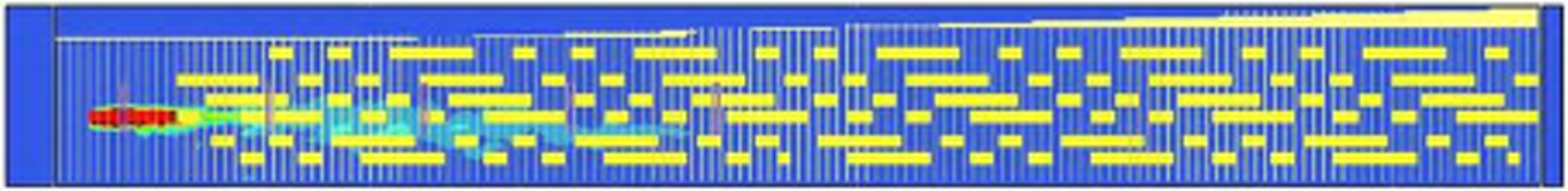

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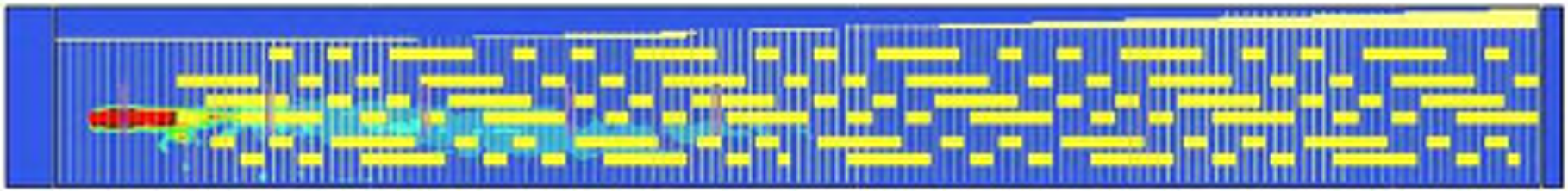

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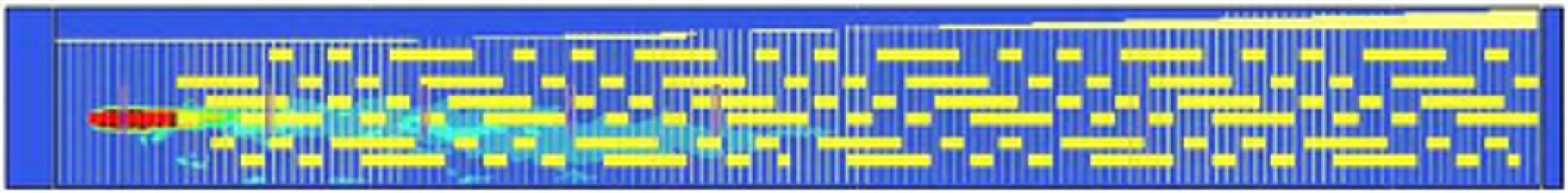
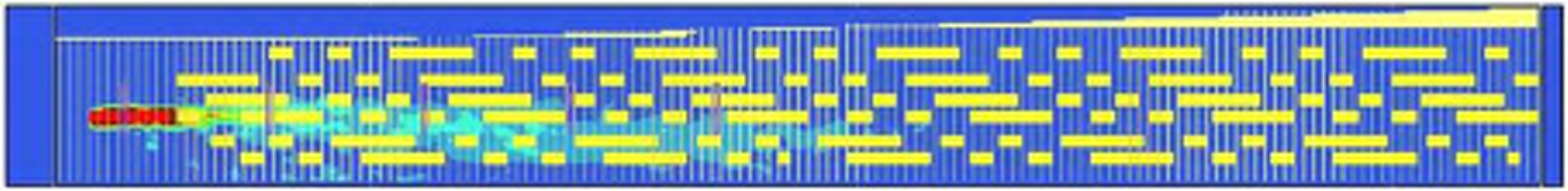
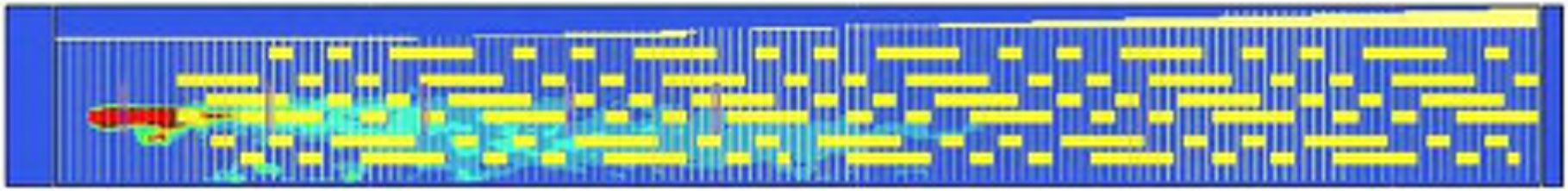


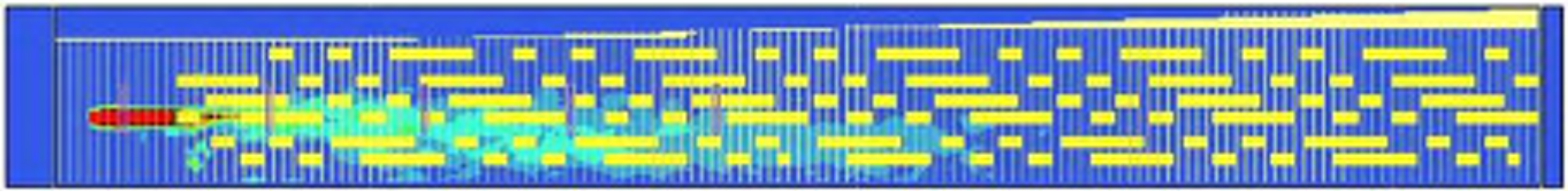
t=330s



t=360s



t=390s



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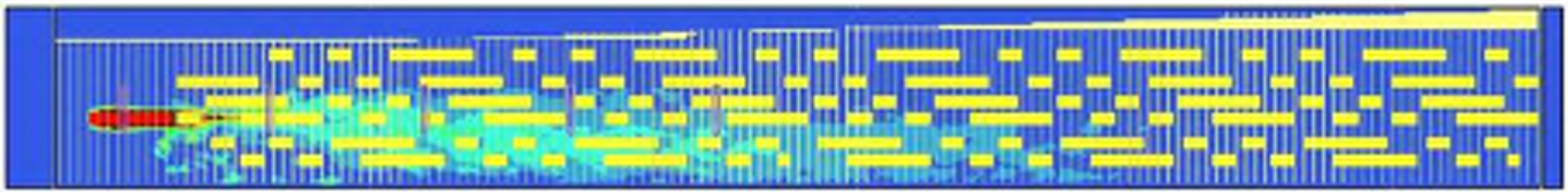

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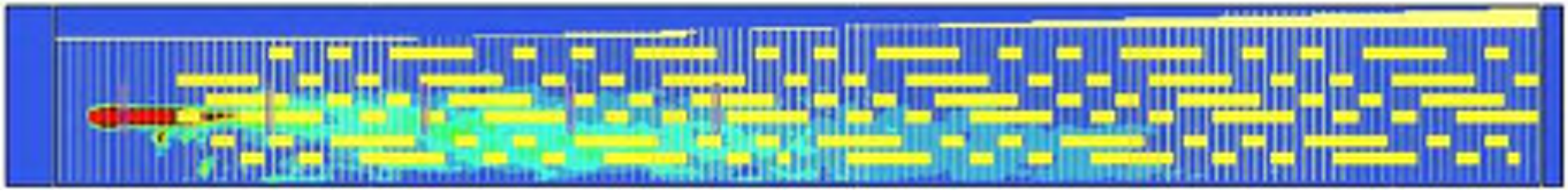

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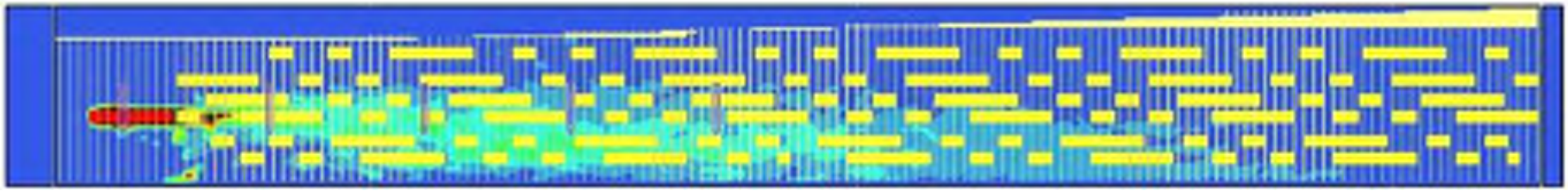
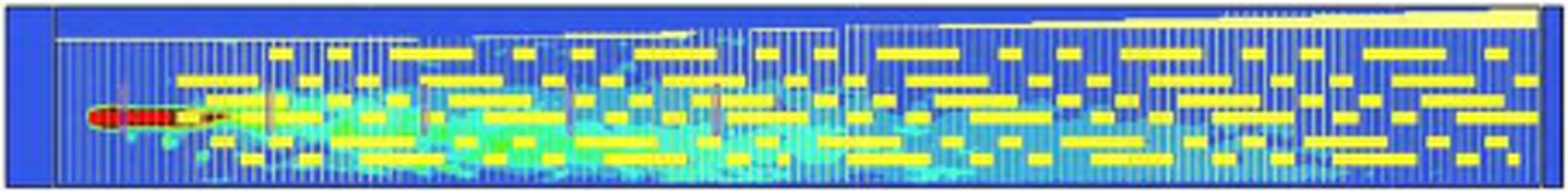
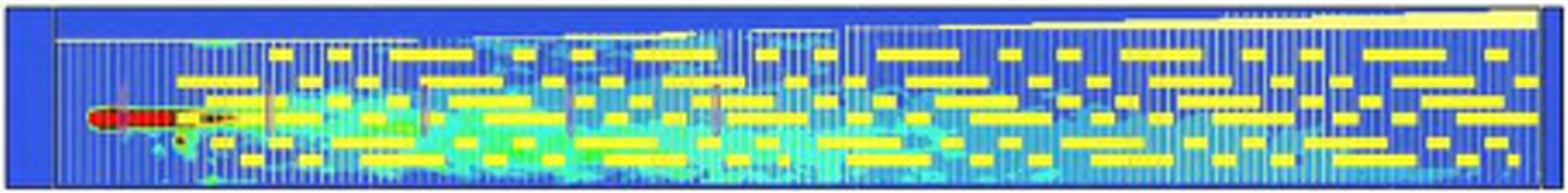


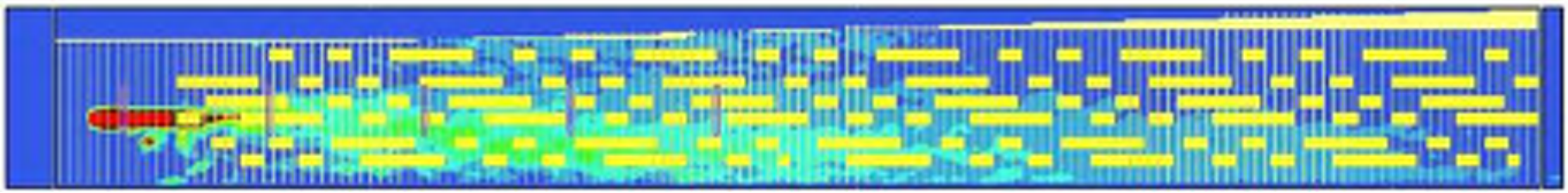
t=510s



t=540s



t=570s



t=600s

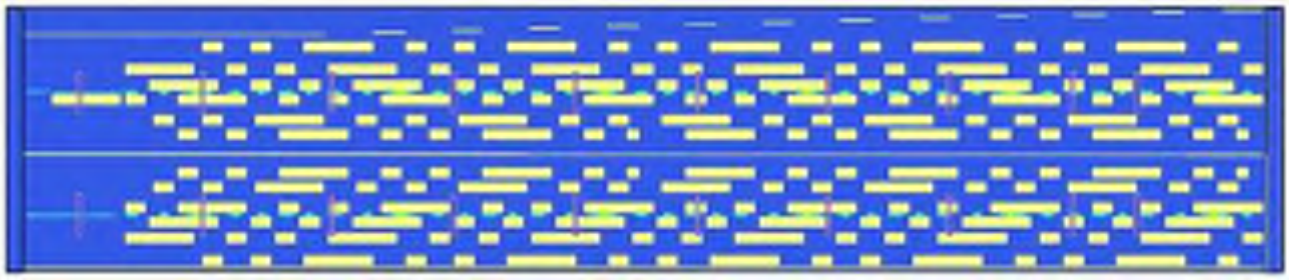
Figure A-4. Temperature on a plane 8.2 ft above Tunnel floor (5 Transverse Ducts)

Appendix B - Figures
Congested Traffic – 350 kcfm Exhaust after 2 min from start of fire

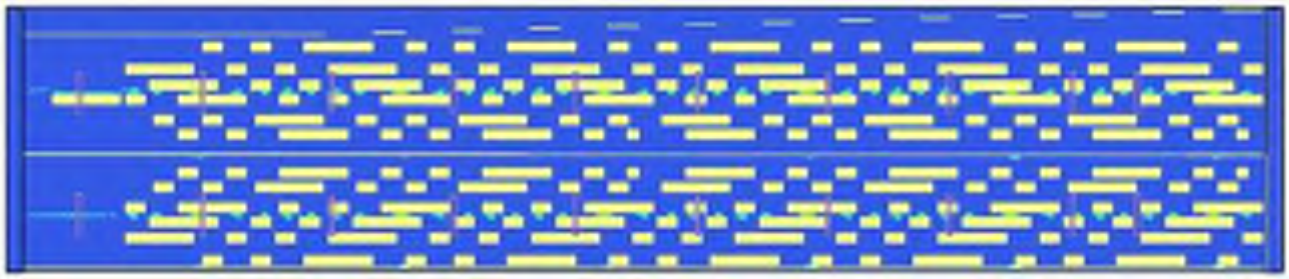
The results for the case with congested traffic are presented in Appendix B. Figure B-1 shows the ppm concentration of NO_2, Figure B-2 shows the ppm concentrations of NO, Figure B-3 shows the ppm concentrations of CO and Figure B-4 shows the extinction coefficient for particulate matter in the tunnels. The results are presented for a period of 30 minutes after congestion begins on a plane 8.2 ft above the floor of the tunnels.

NO_2 PPM:

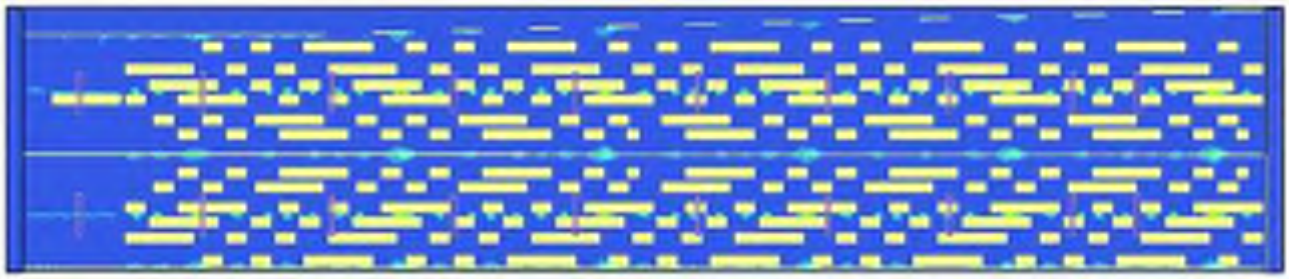
t=0s



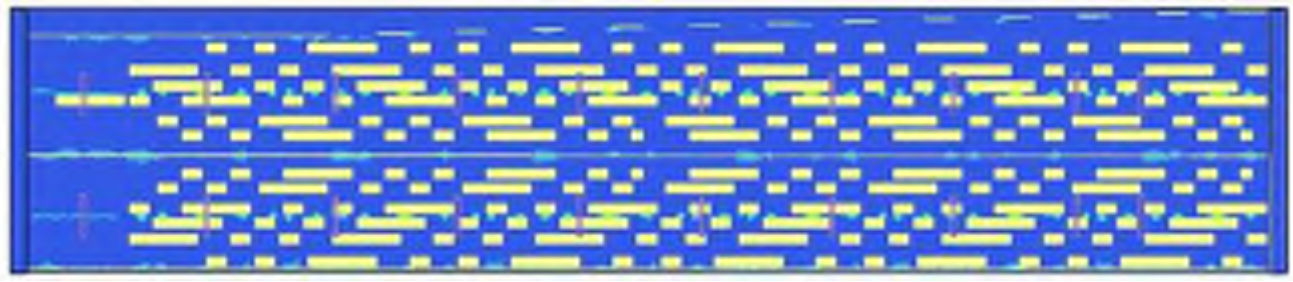
t=30s



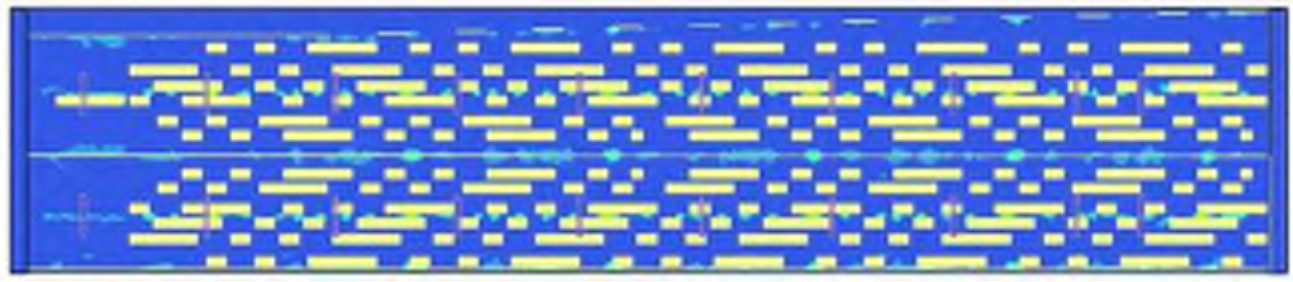
t=60s



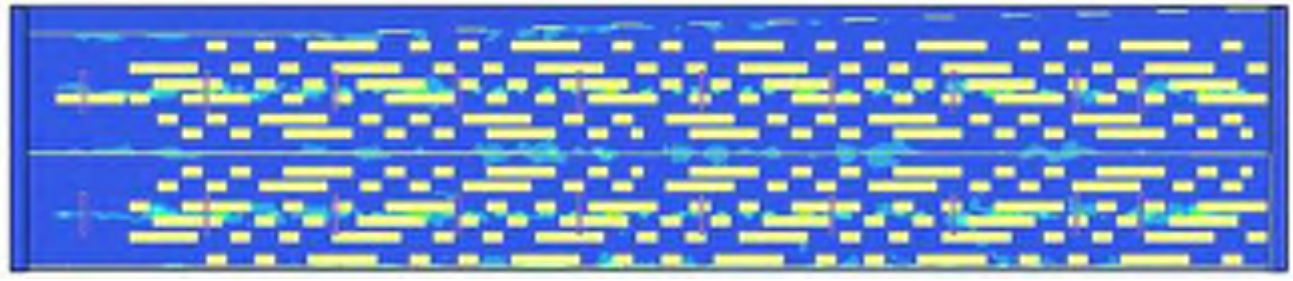
t=90s



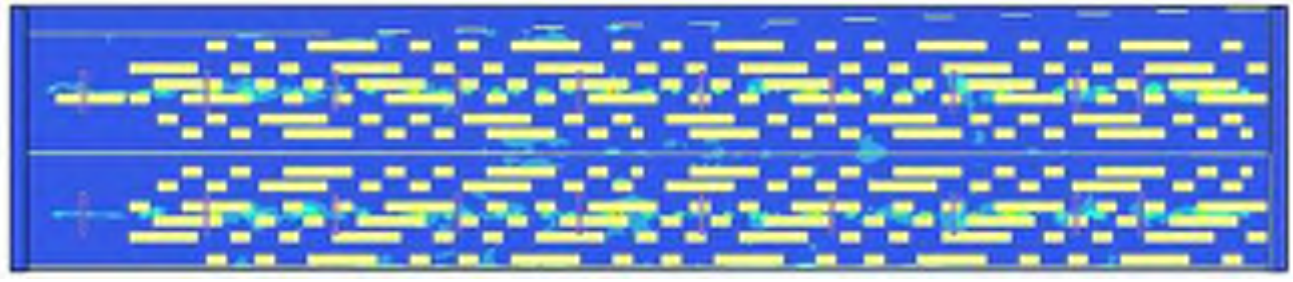
t=120s



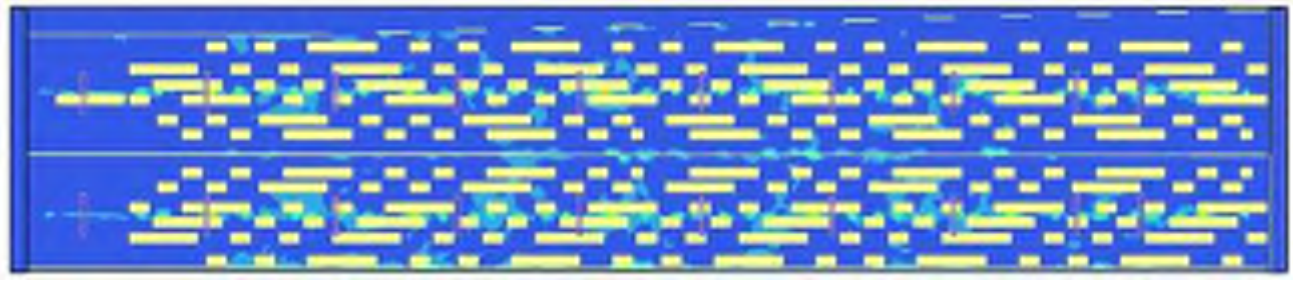
t=150s



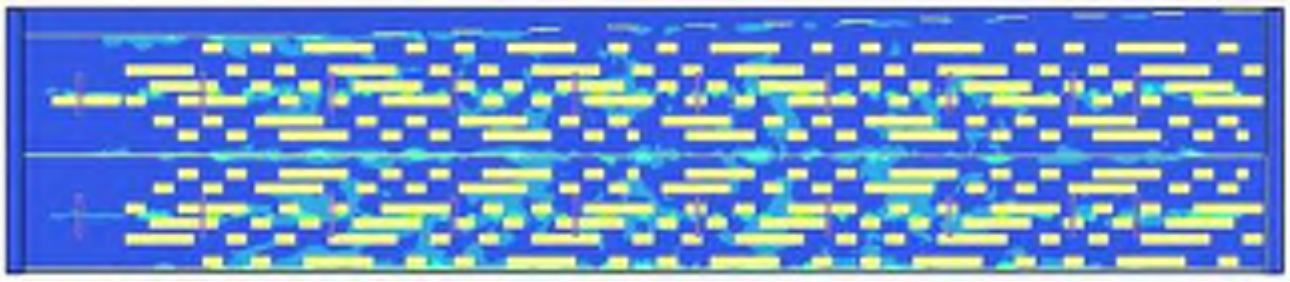
t=180s



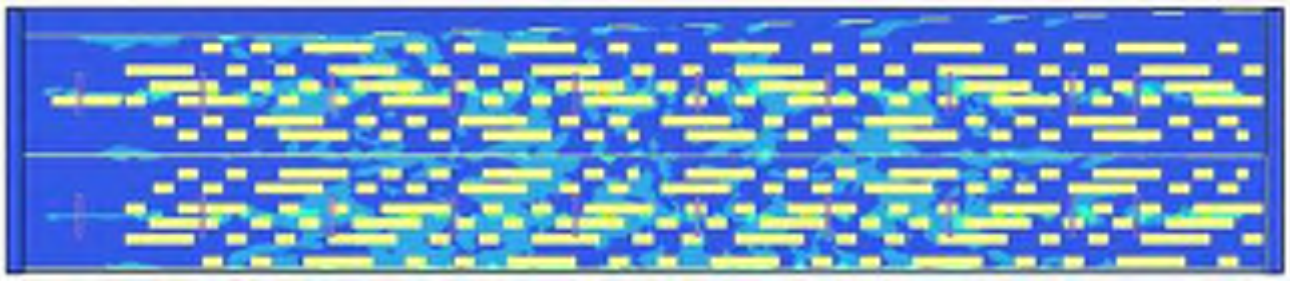
t=210s



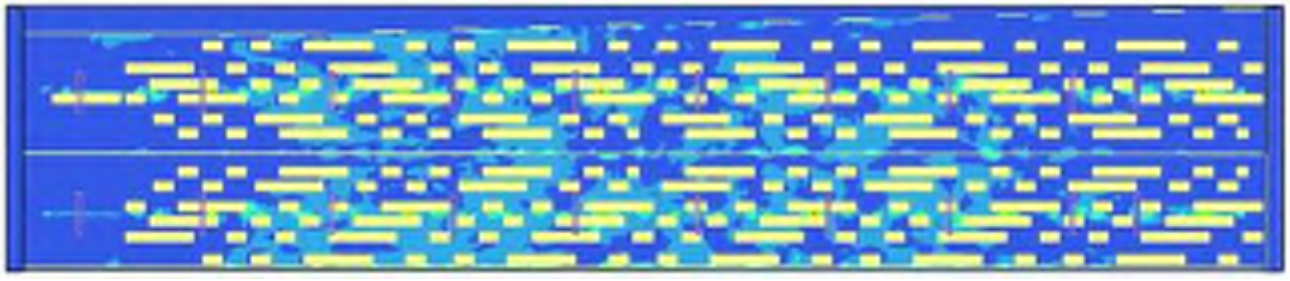
t=240s



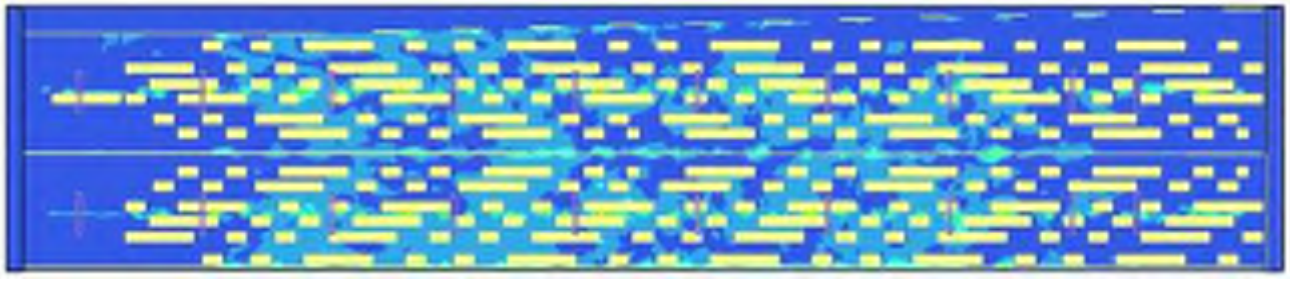
t=270s



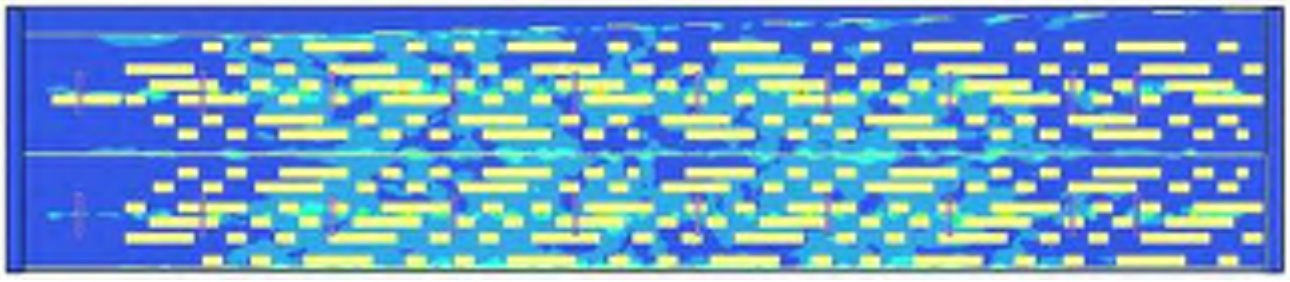
t=300s



t=330s



t=360s



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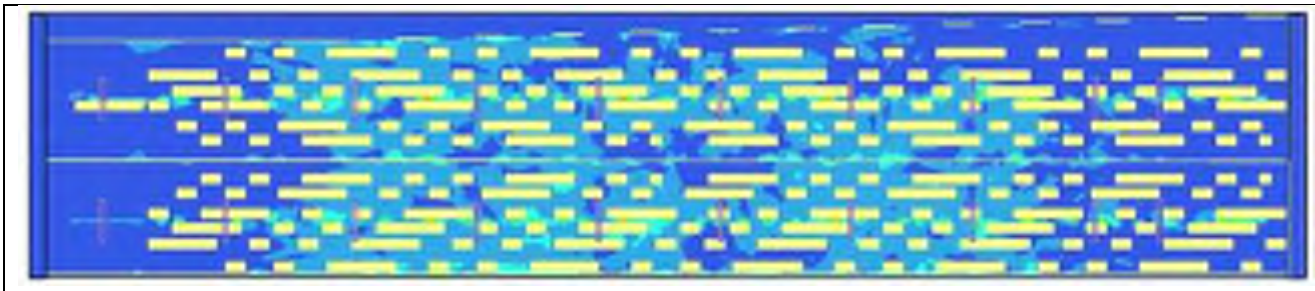
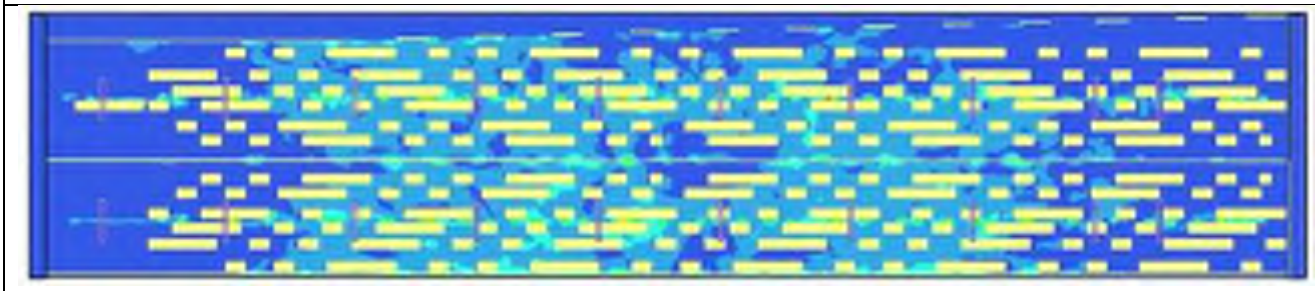


t=420s



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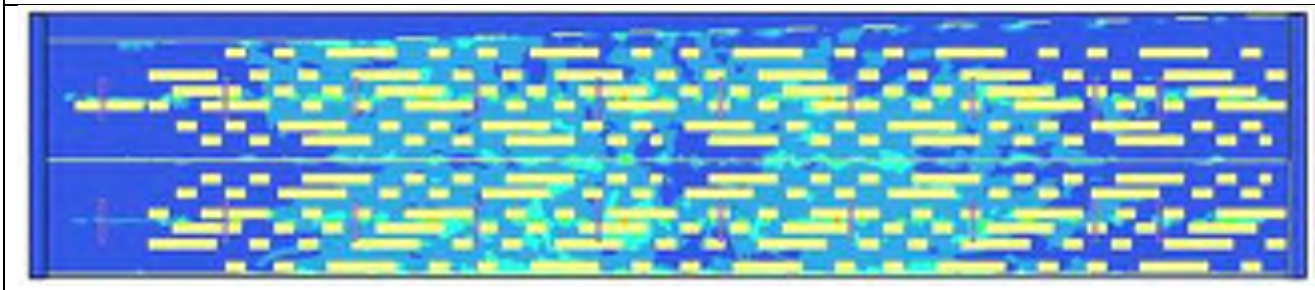

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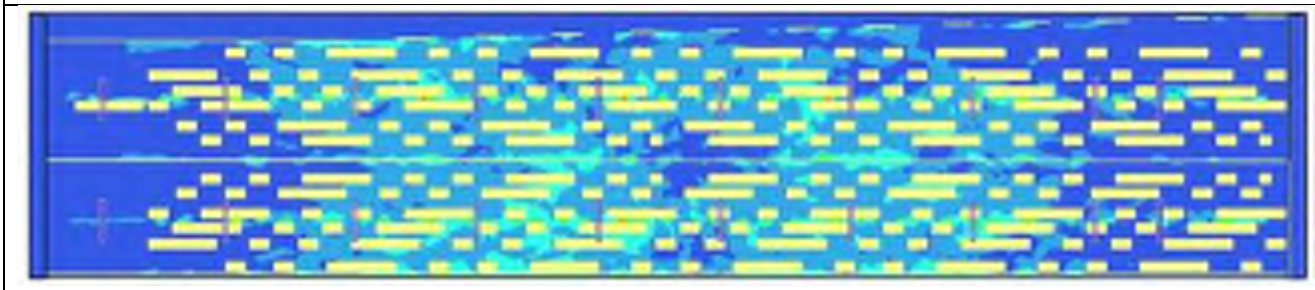

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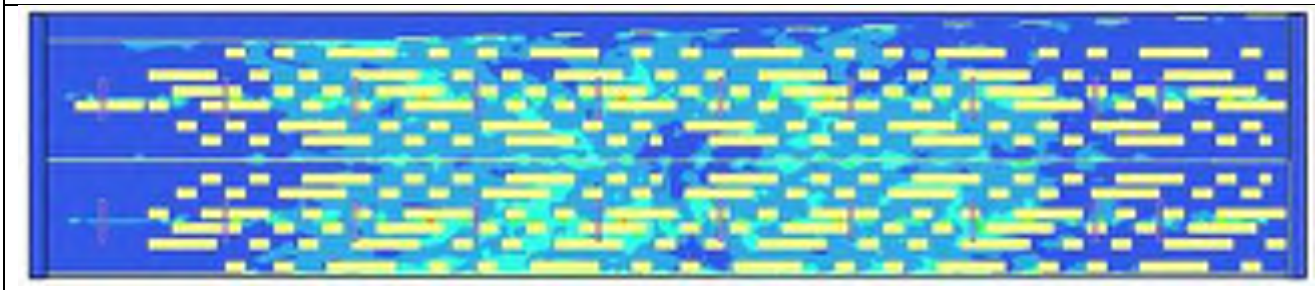

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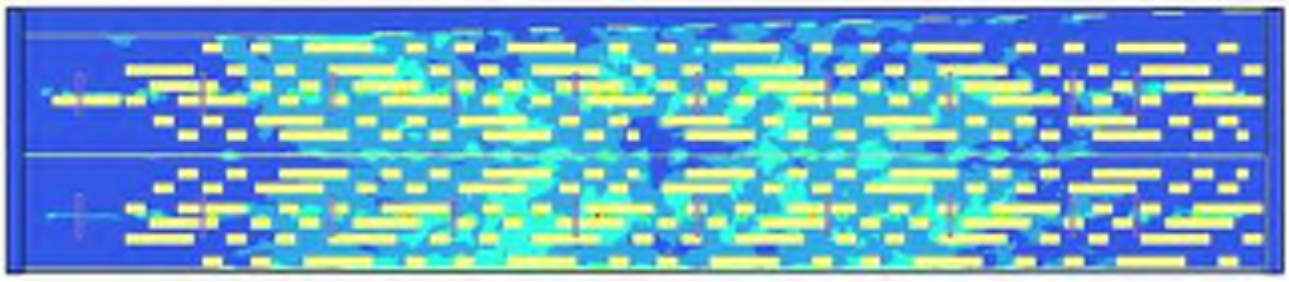

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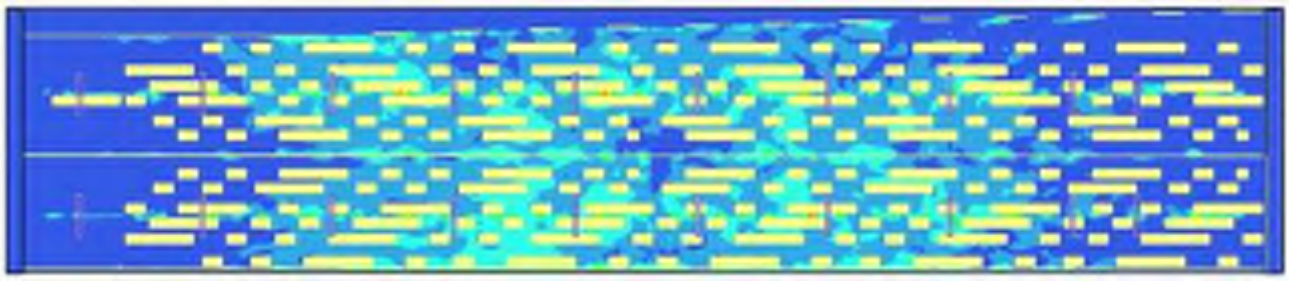

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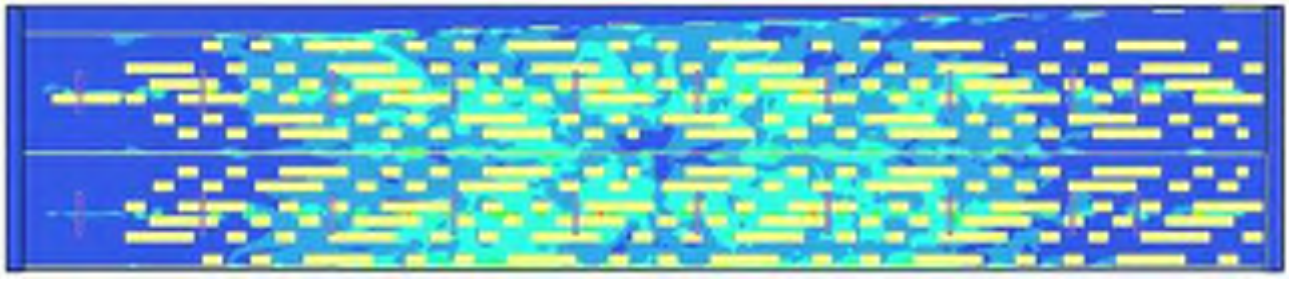

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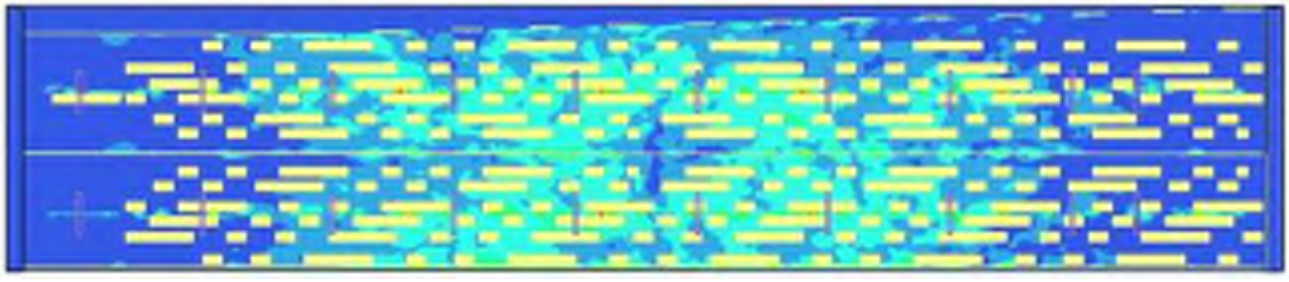

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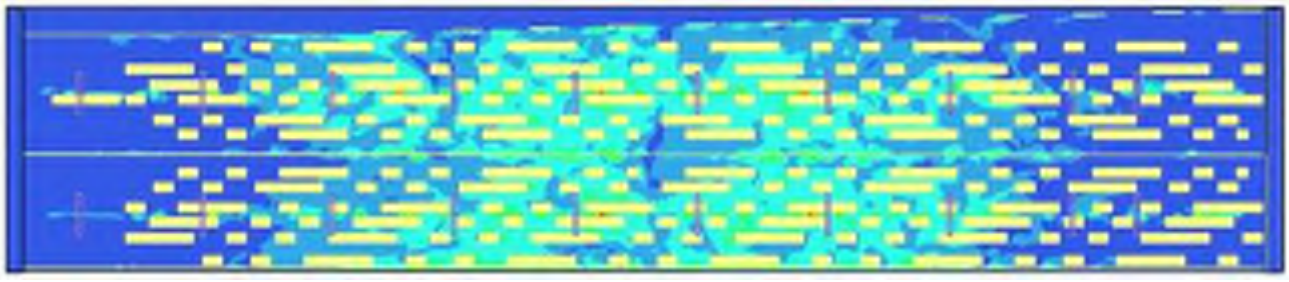

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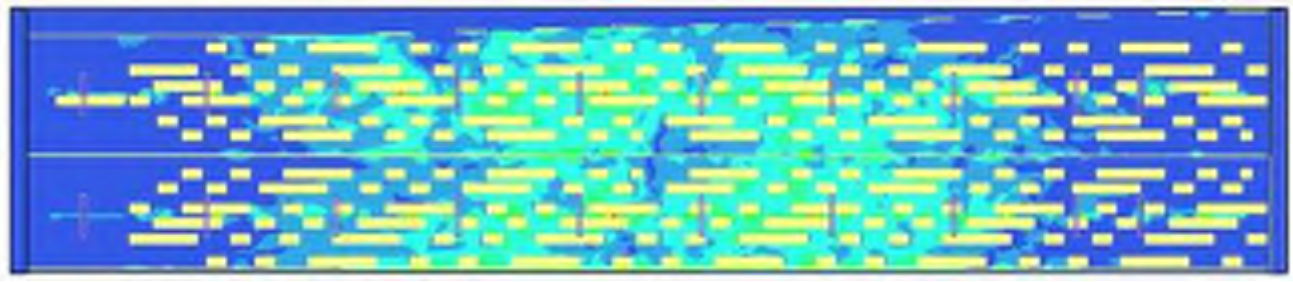

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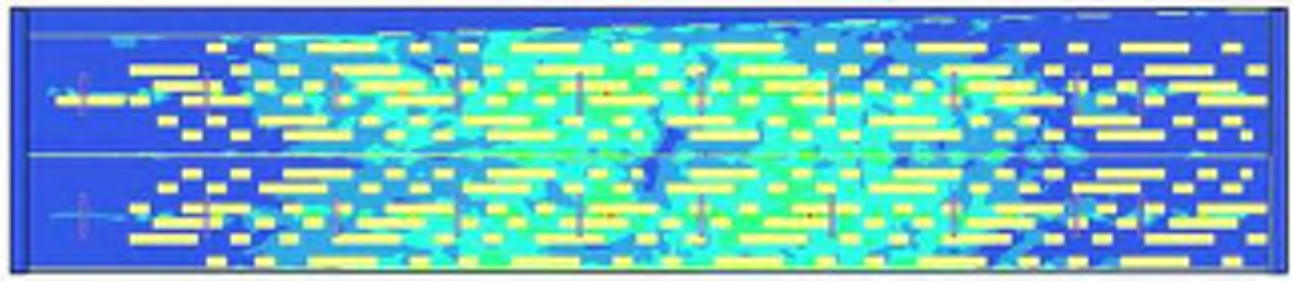

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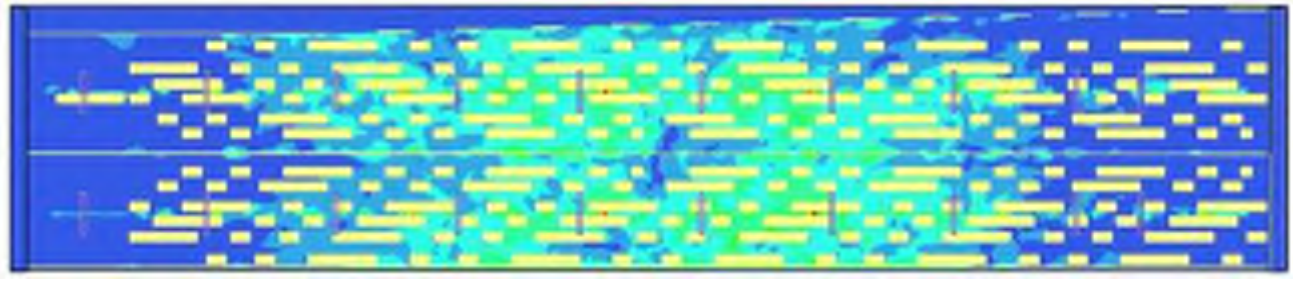

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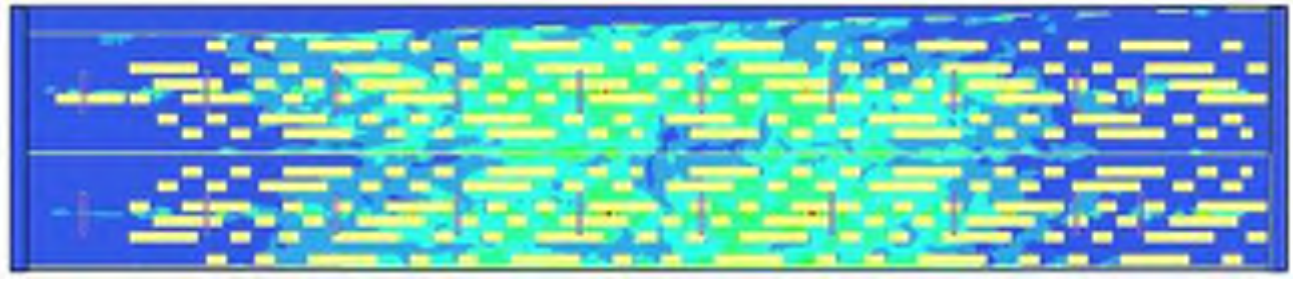

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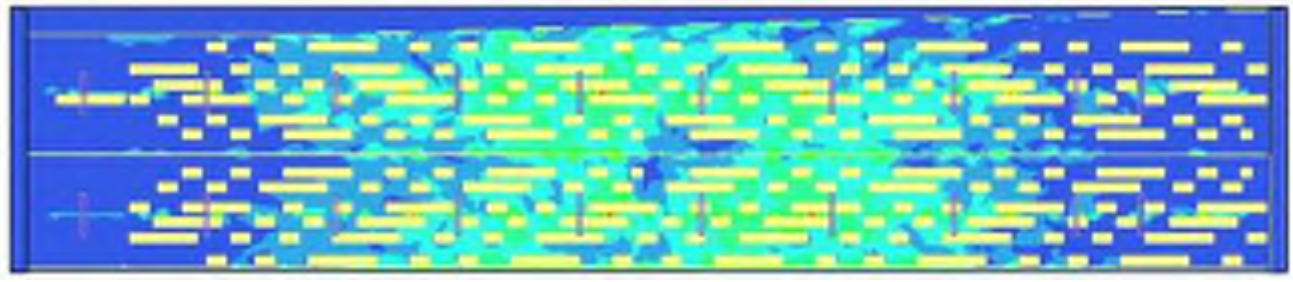

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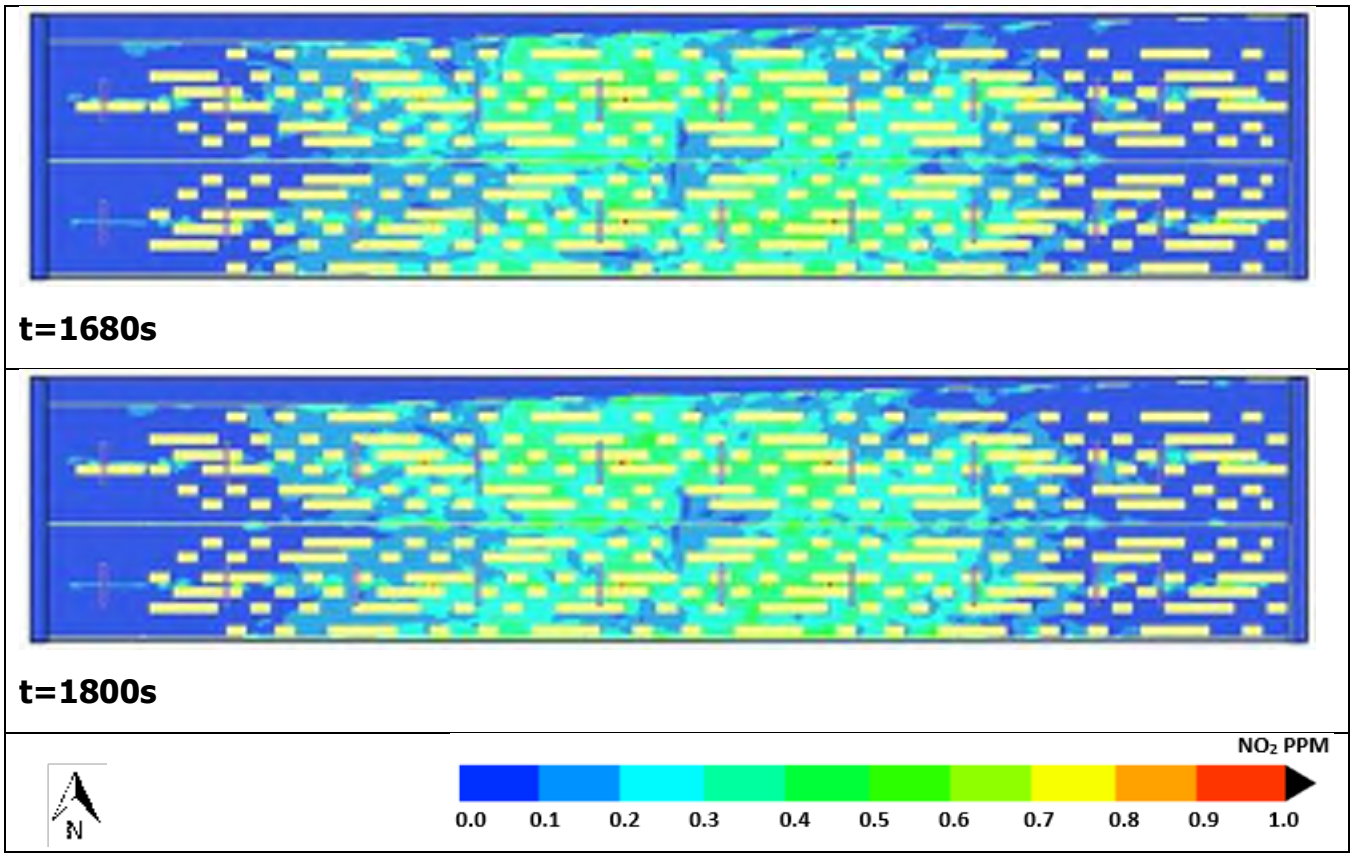
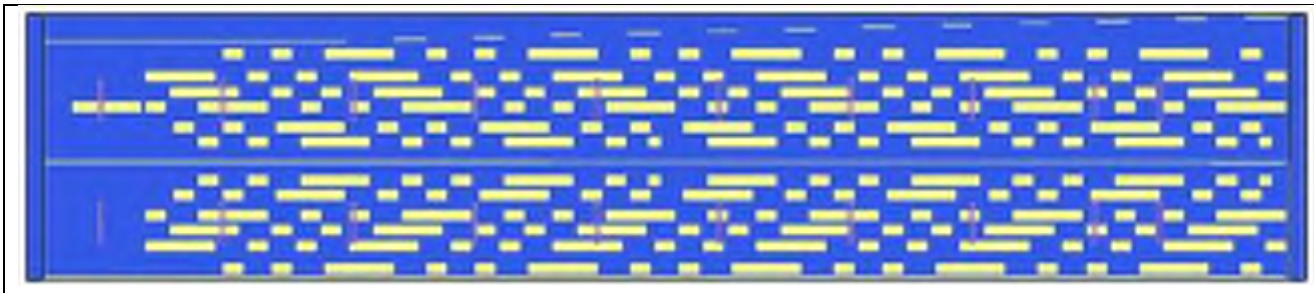
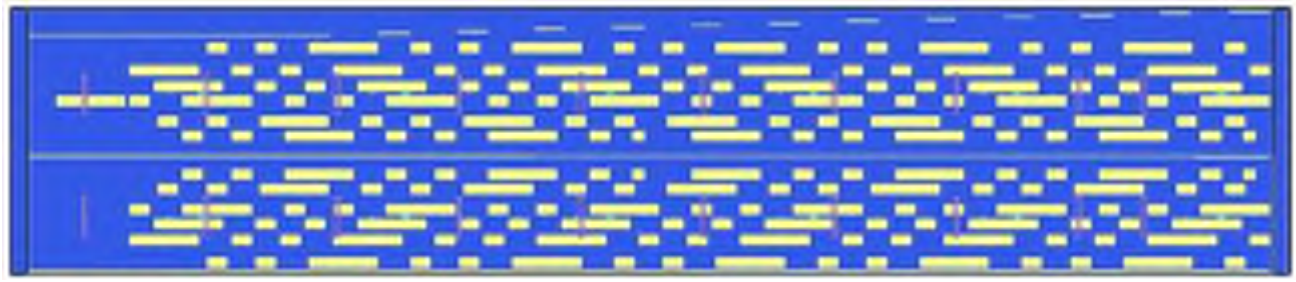


Figure B-1. NO_2 ppm concentration on a plane 8.2 ft above Tunnel floor (350 kcfm exhaust 120 s after start of fire)

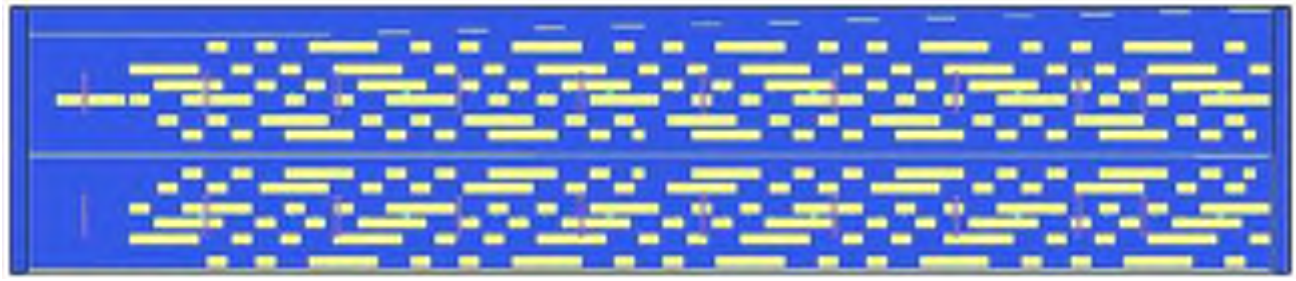
NO PPM:



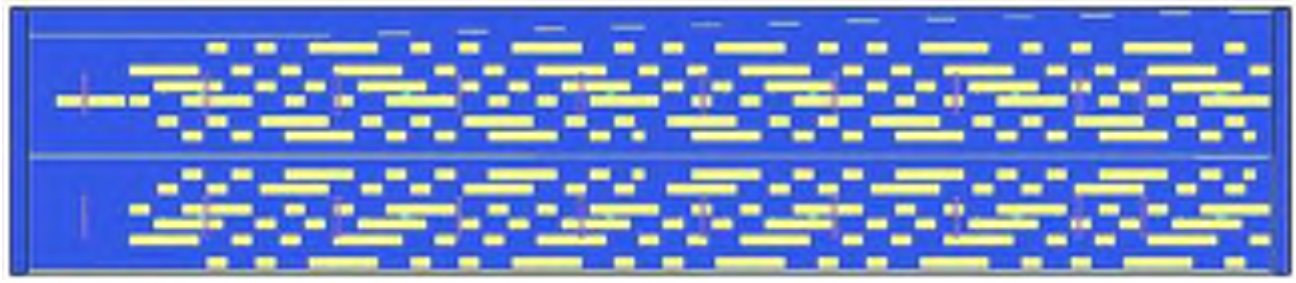
t=0s



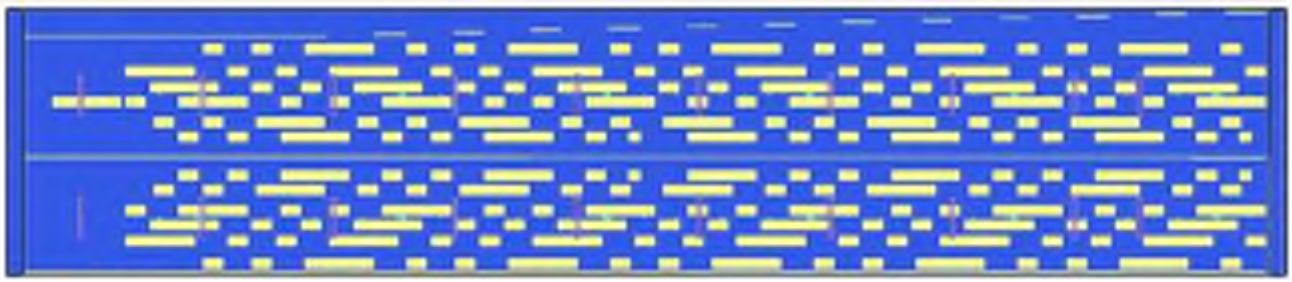
t=30s



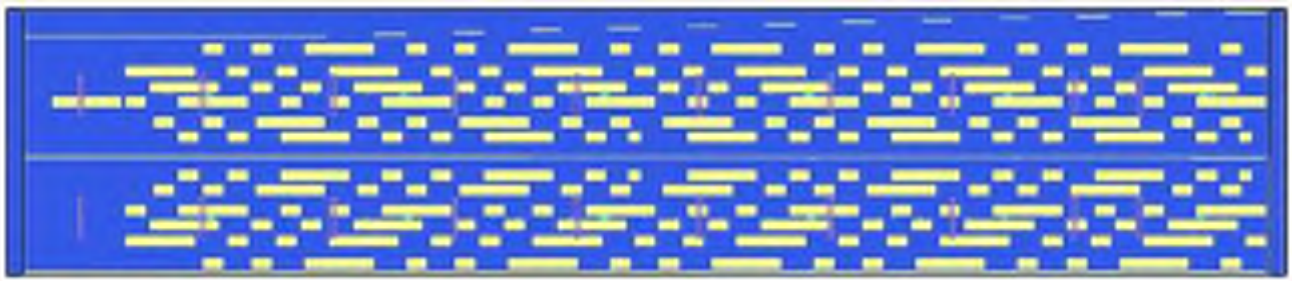
t=60s



t=90s



t=120s



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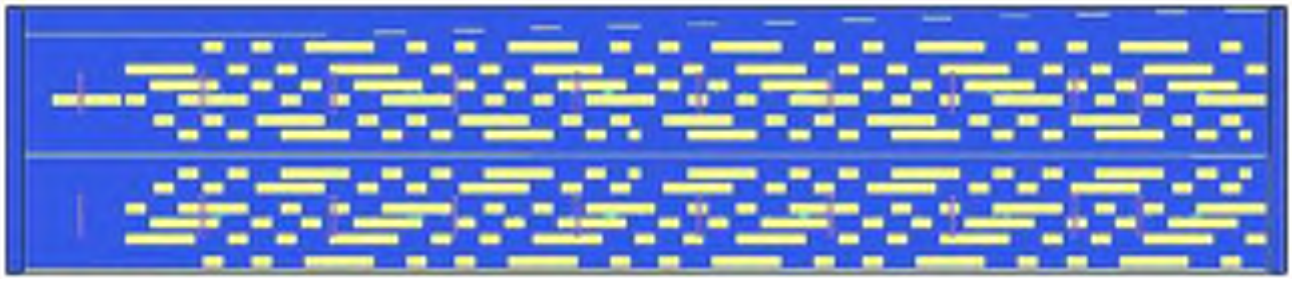
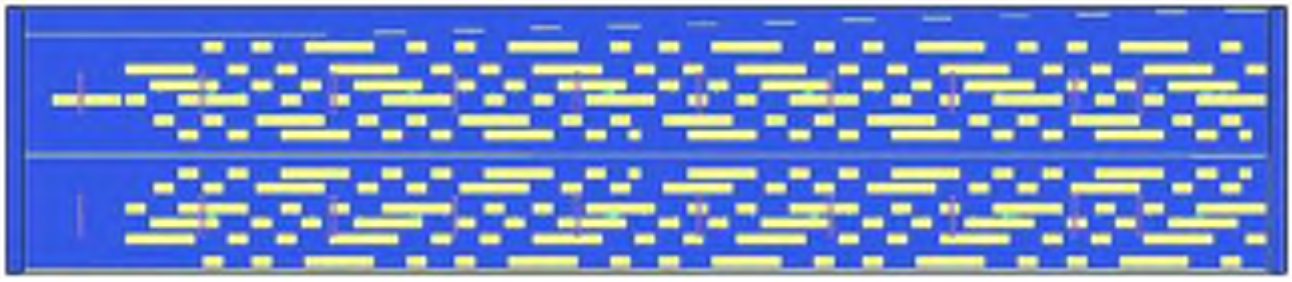
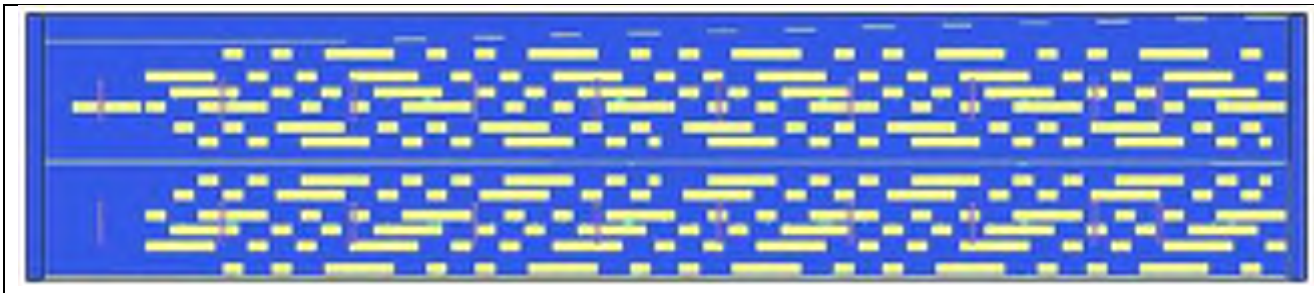


t=180s

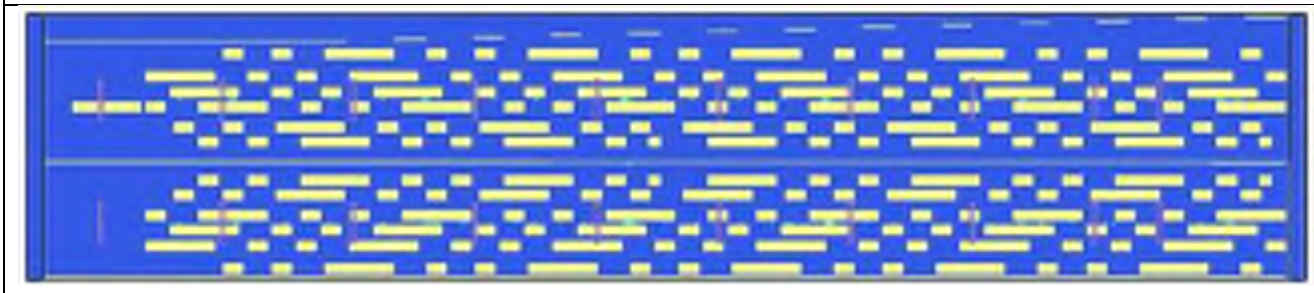


t=210s

t=240s



t=270s



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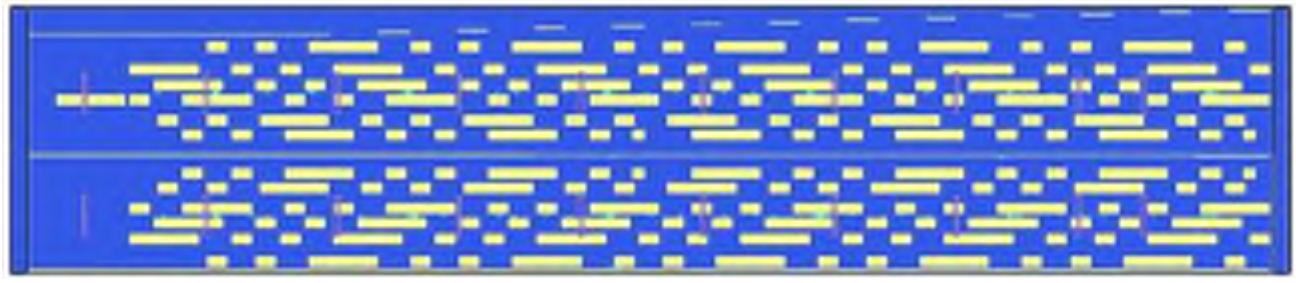

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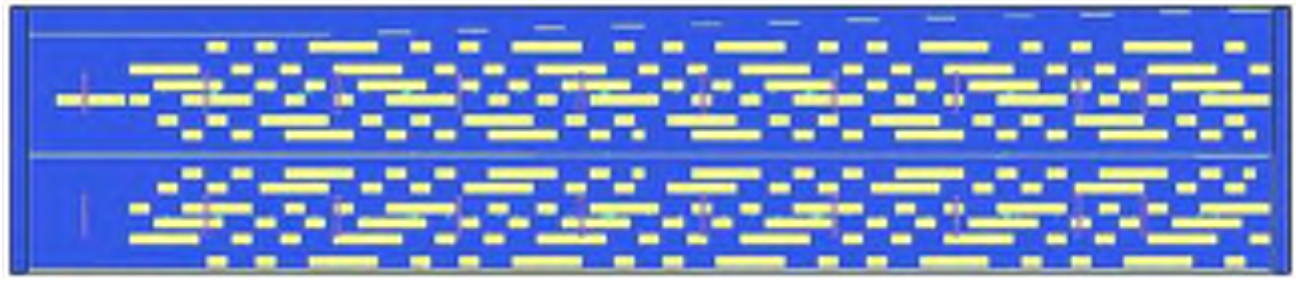
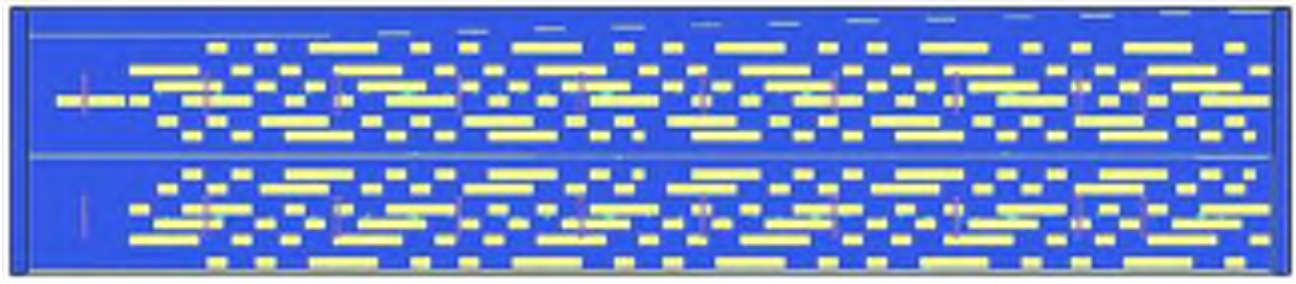
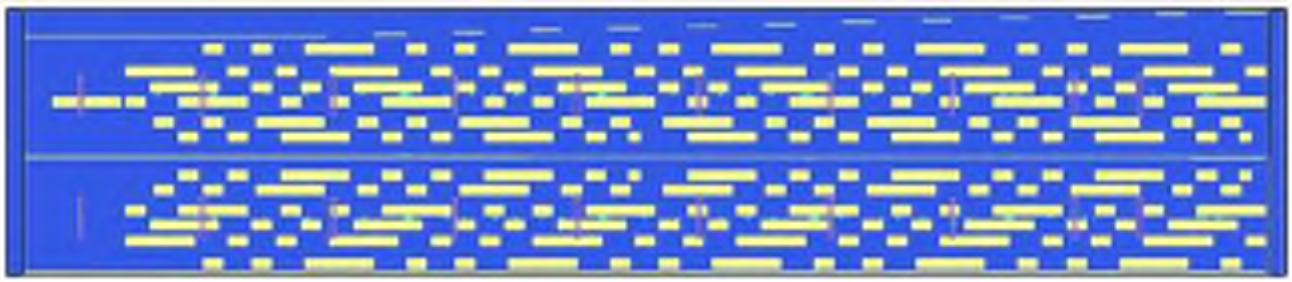


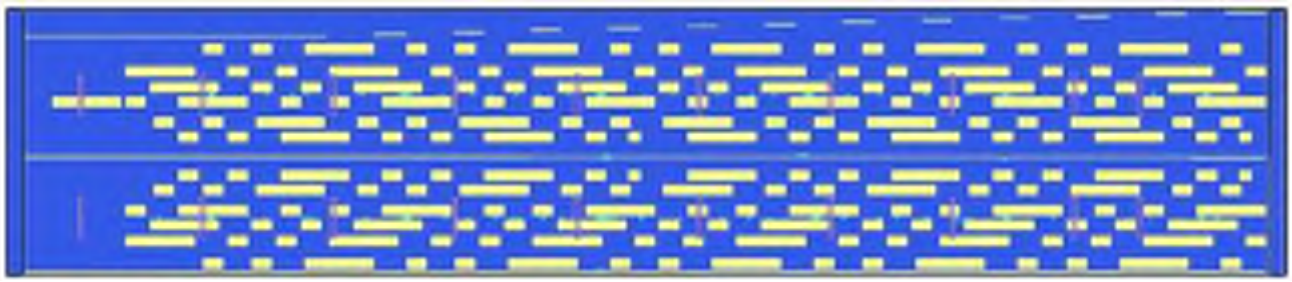
t=360s



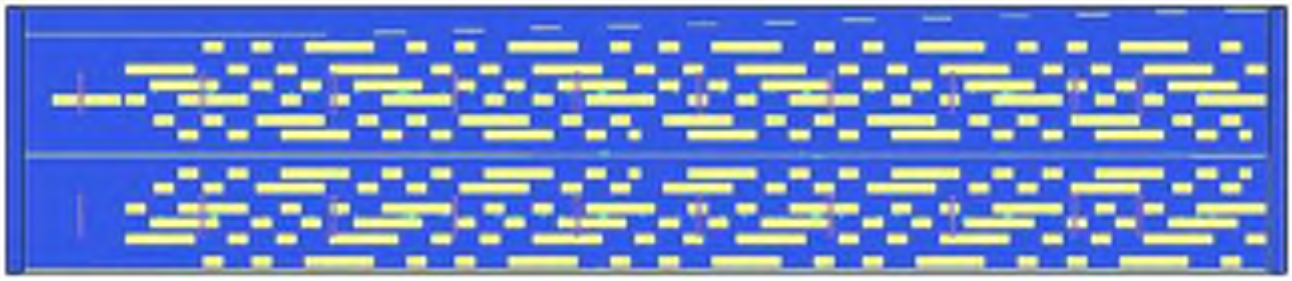
t=390s



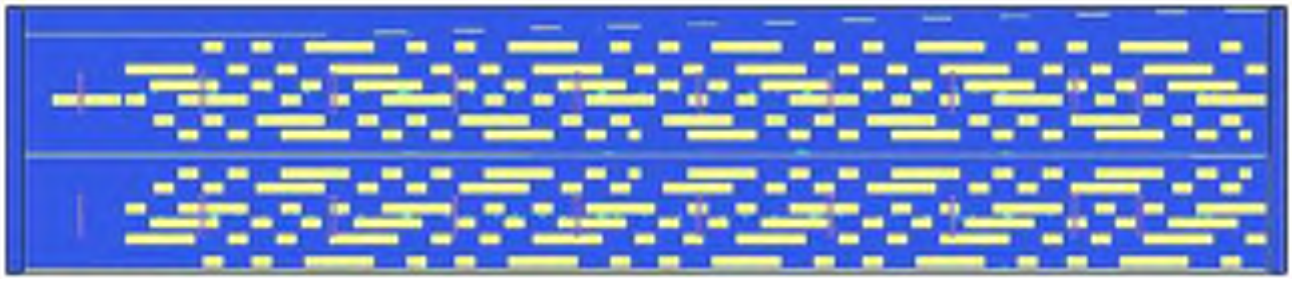
t=420s



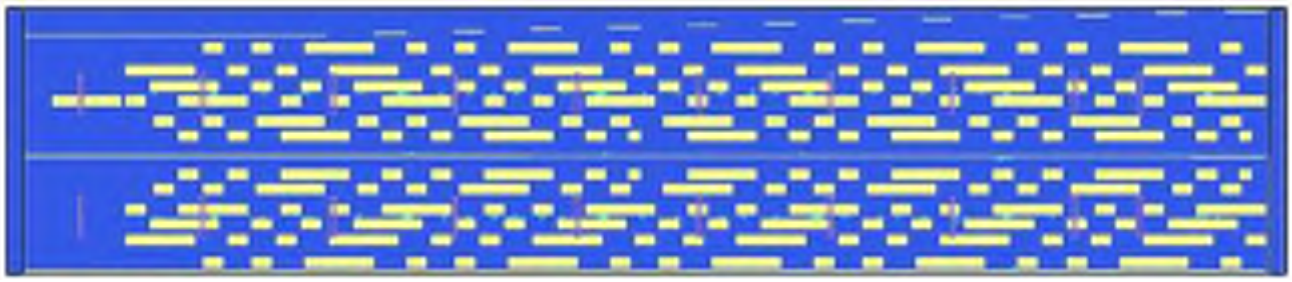
t=450s



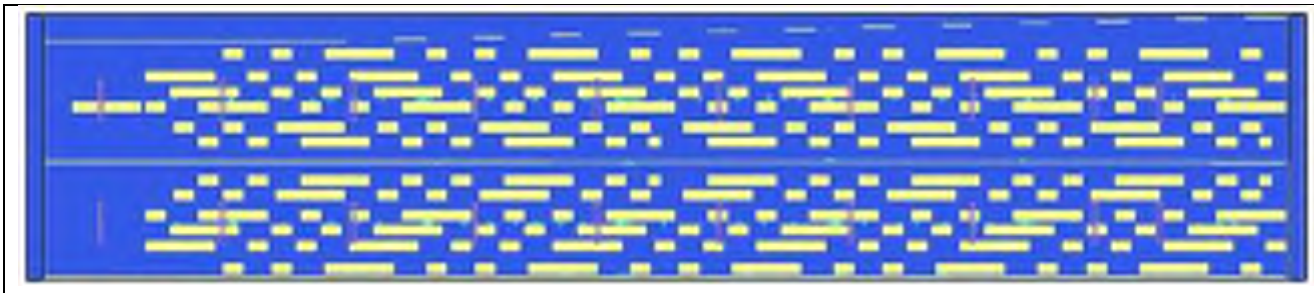
t=480s



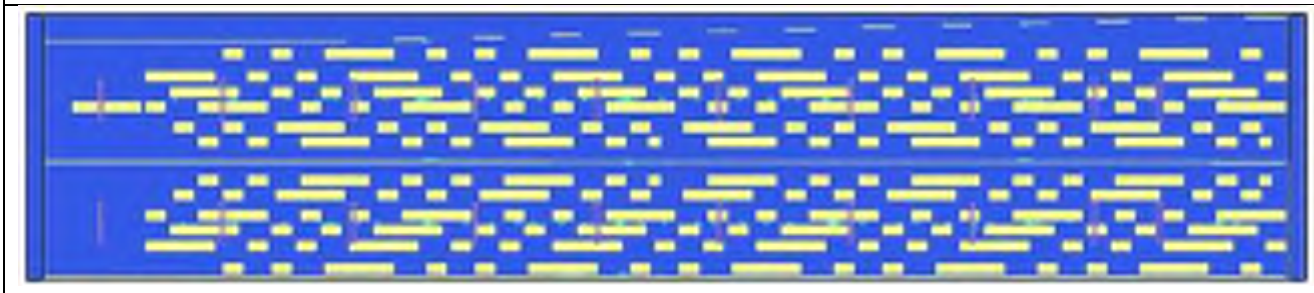
t=510s



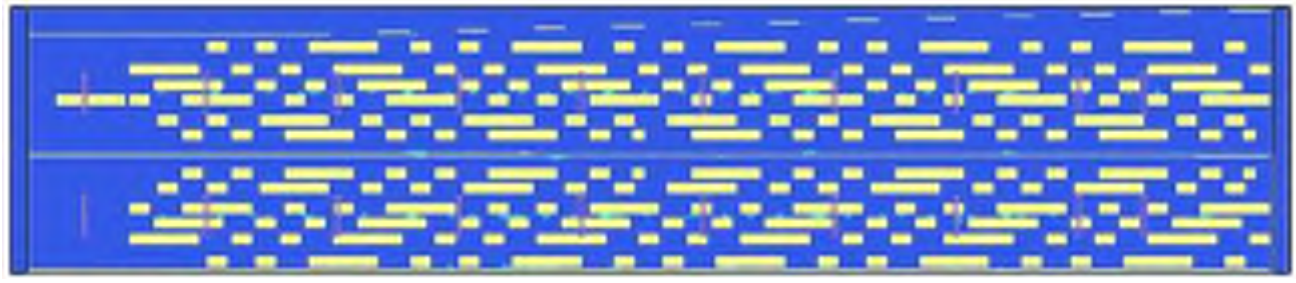
t=540s



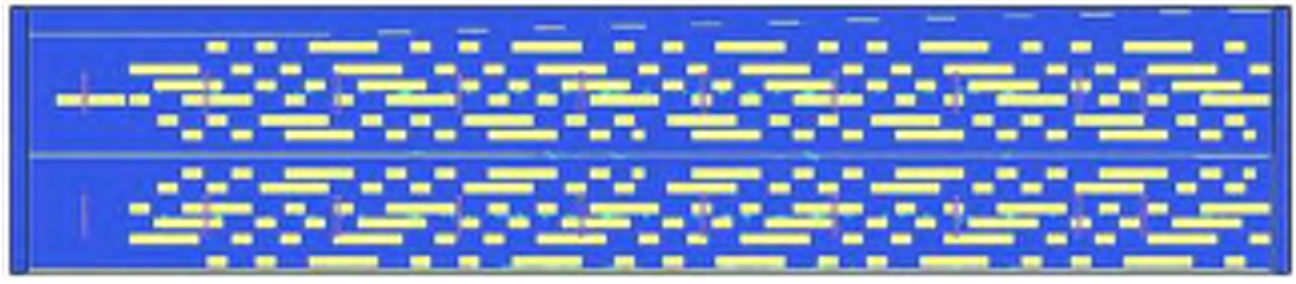
t=570s



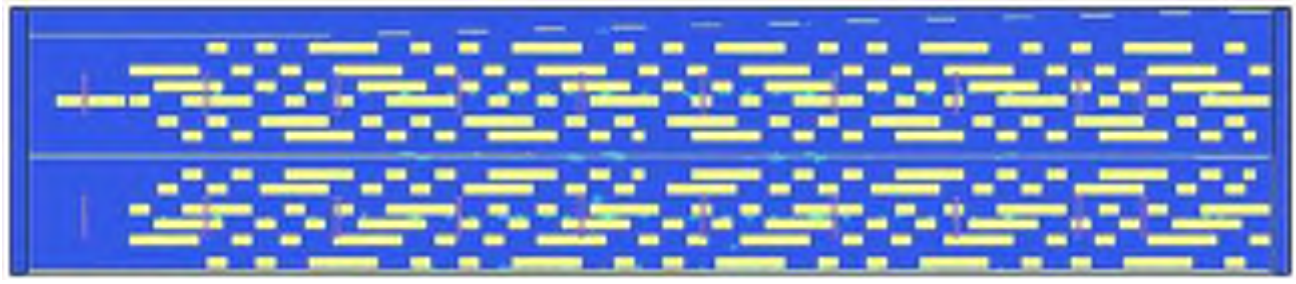
t=600s



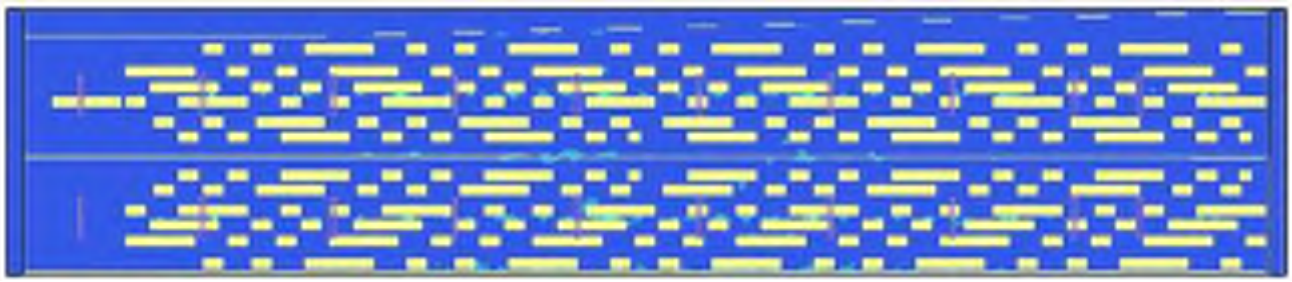
t=720s



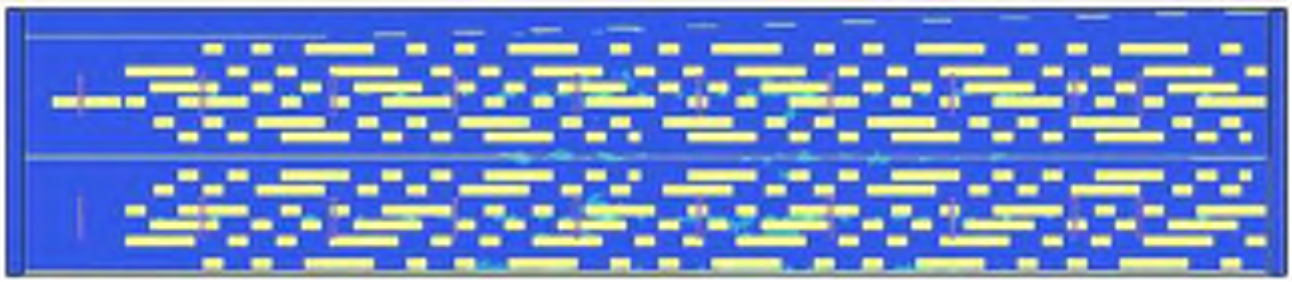
t=840s



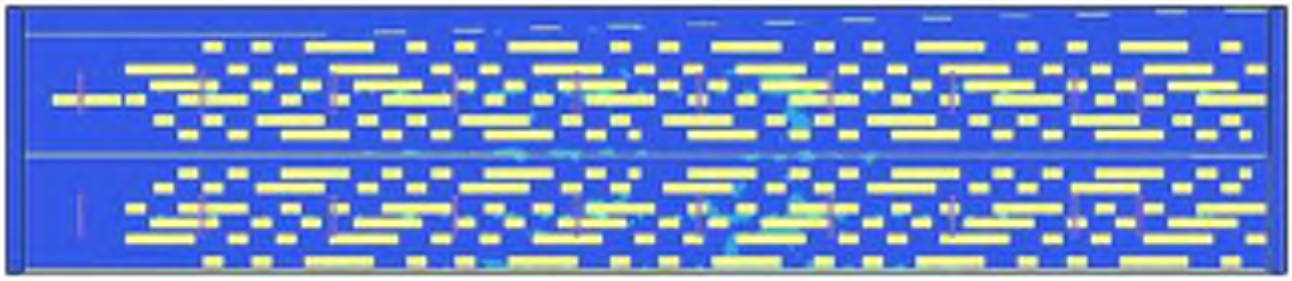
t=960s



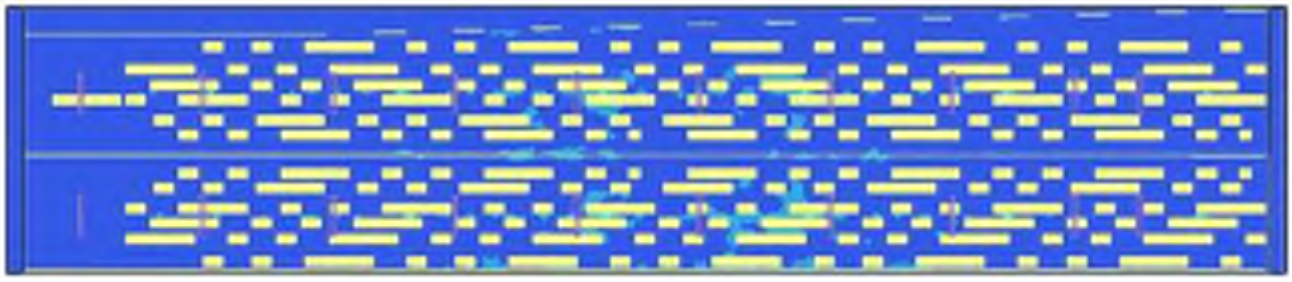
t=1080s



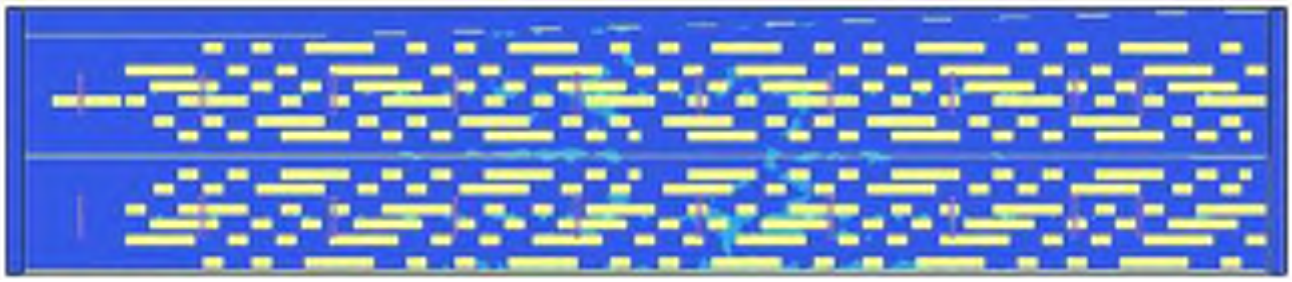
t=1200s



t=1320s



t=1440s



t=1560s

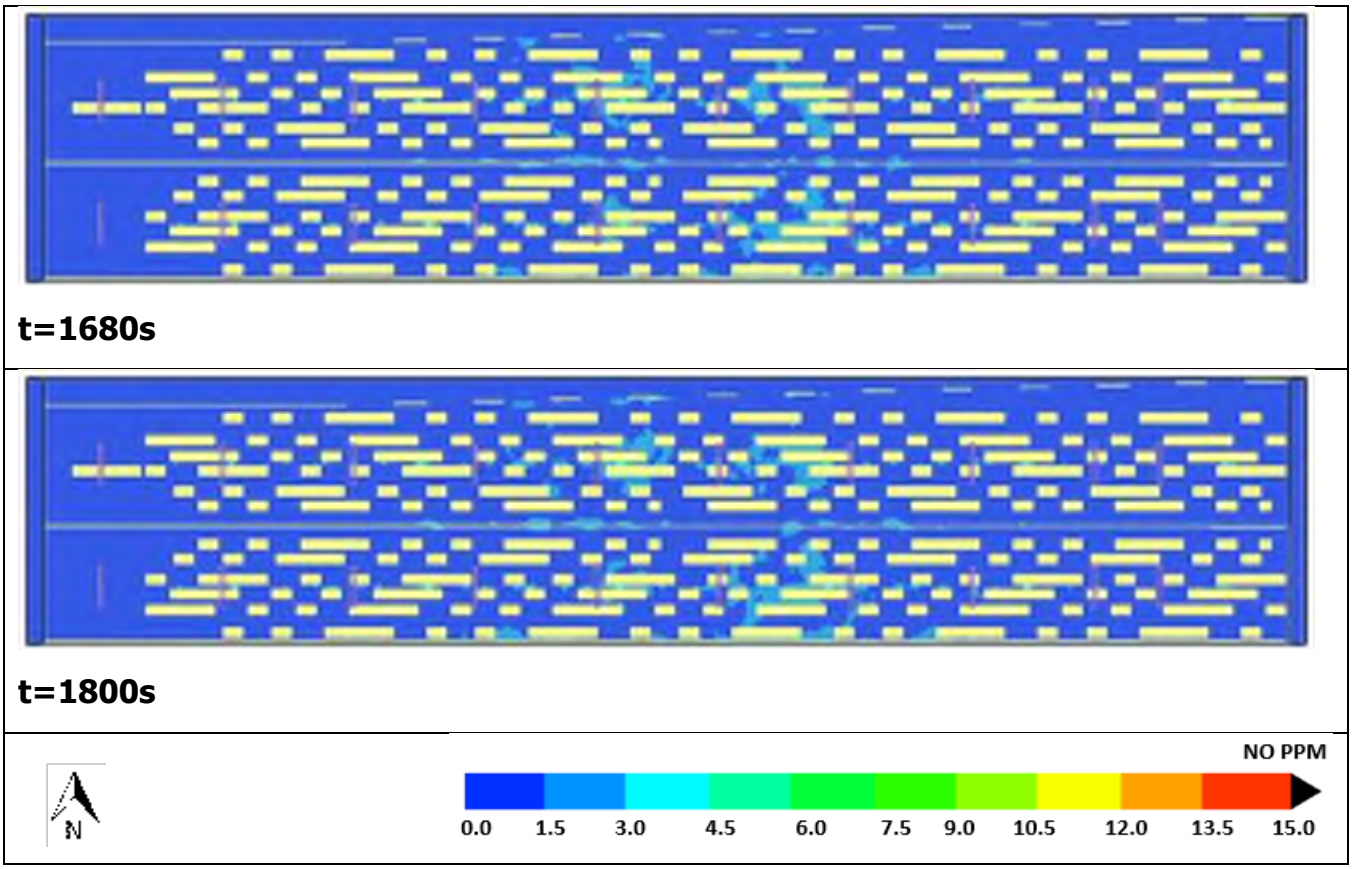


Figure B-2. NO ppm concentration on a plane 8.2 ft above Tunnel floor (350 kcfm exhaust after 120s from start of fire)

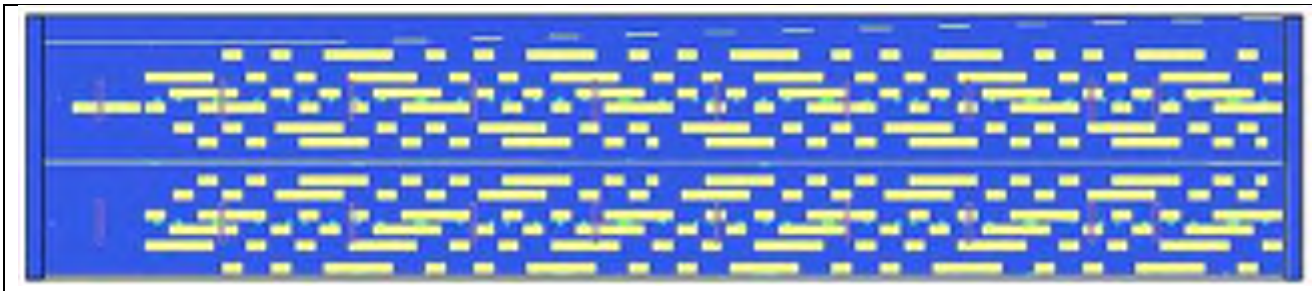
CO PPM:

t=0s

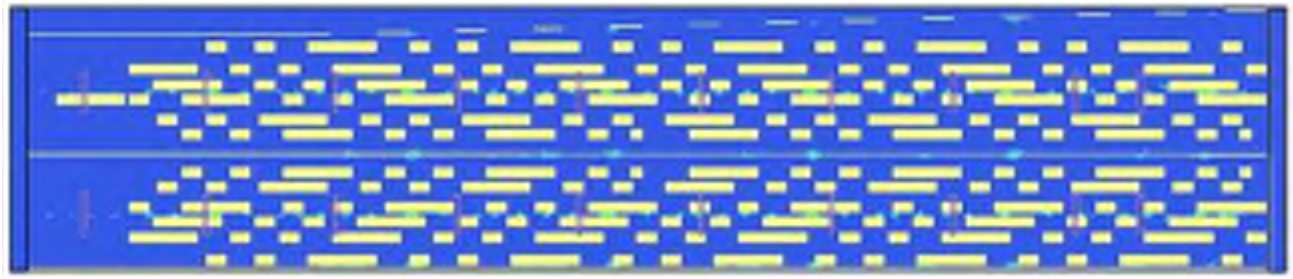
t=30s

t=60s

t=90s



t=120s

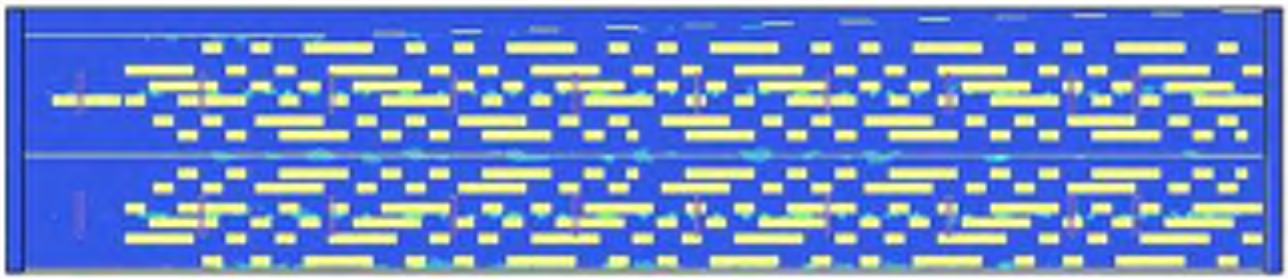


t=150s

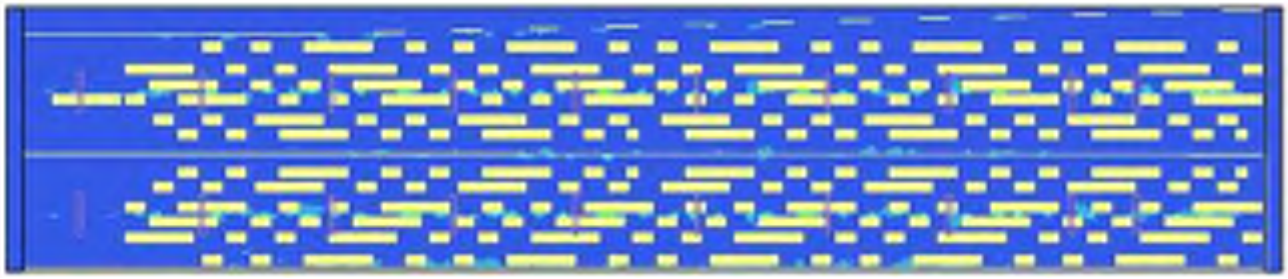
t=180s

t=210s

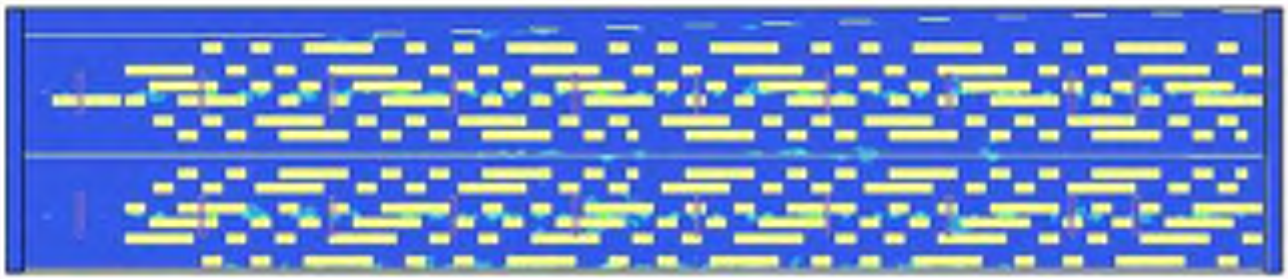
t=240s



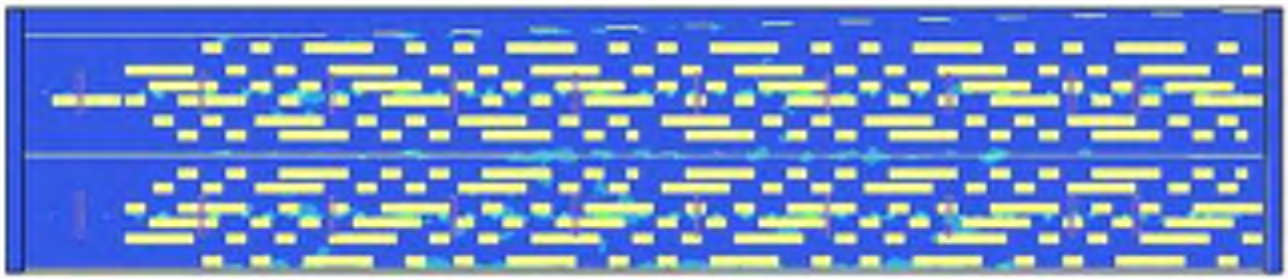
t=270s



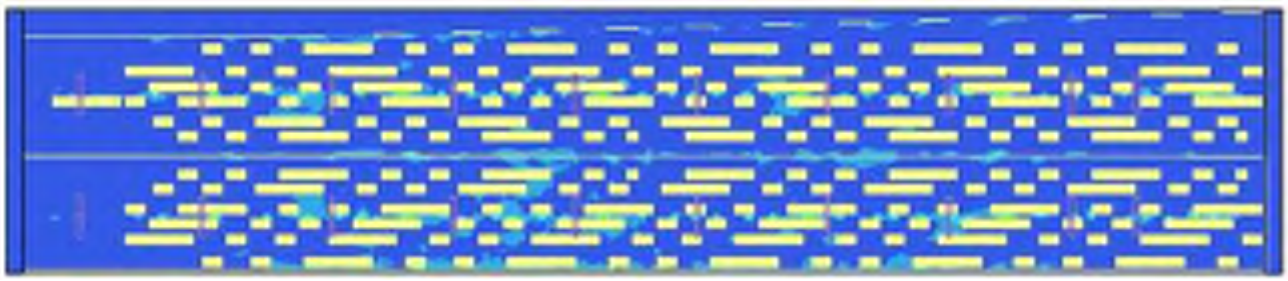
t=300s



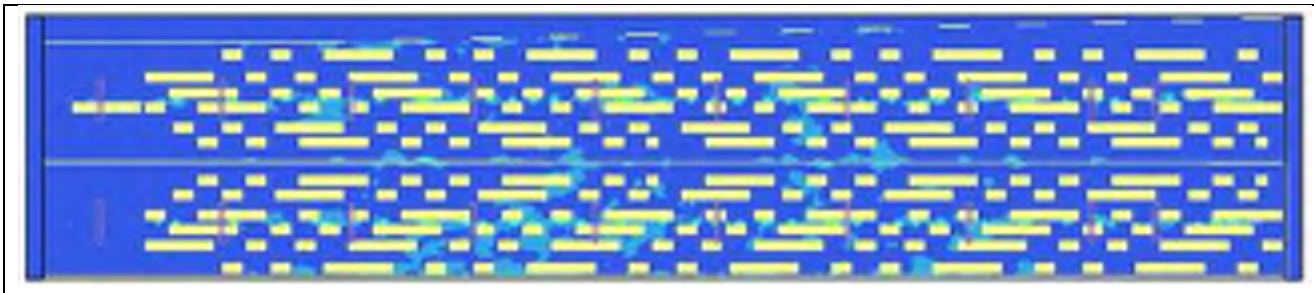
t=330s



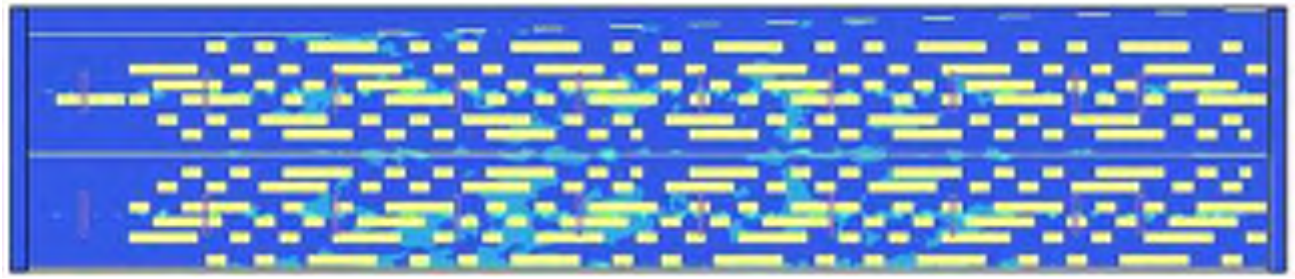
t=360s



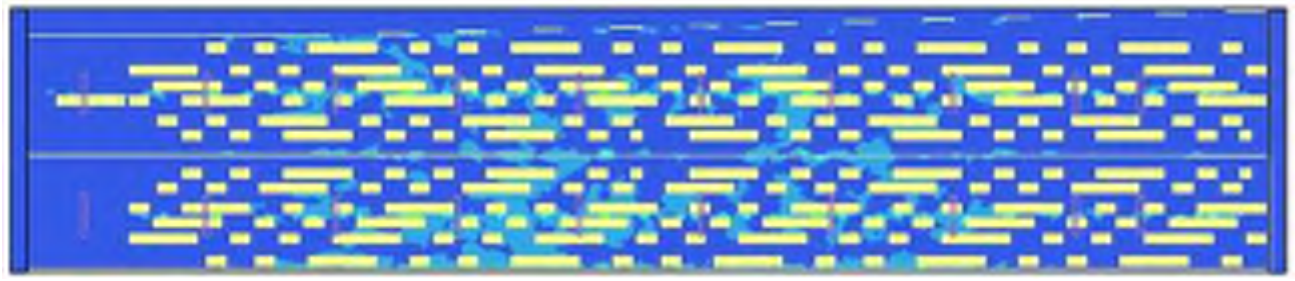
t=390s



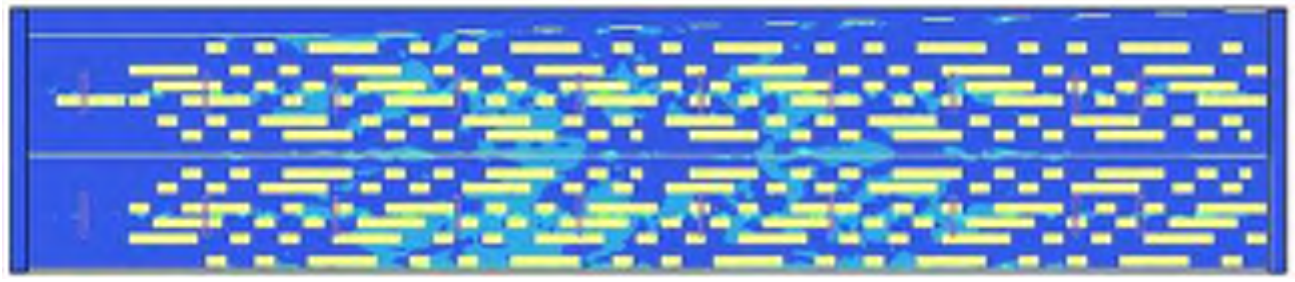
t=420s



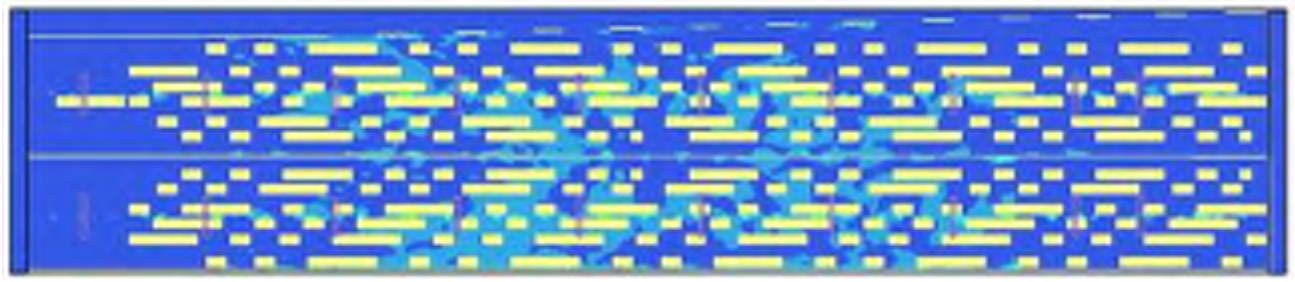
t=450s



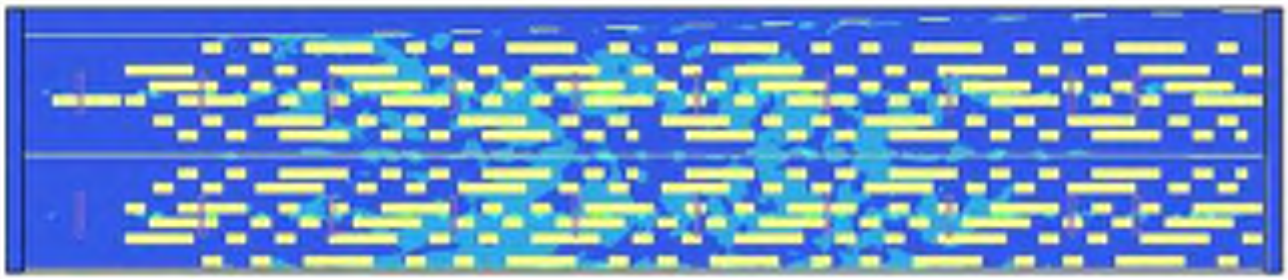
t=480s



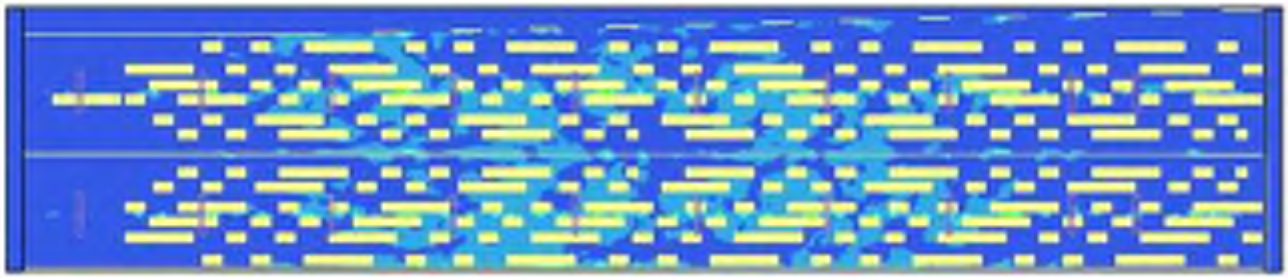
t=510s



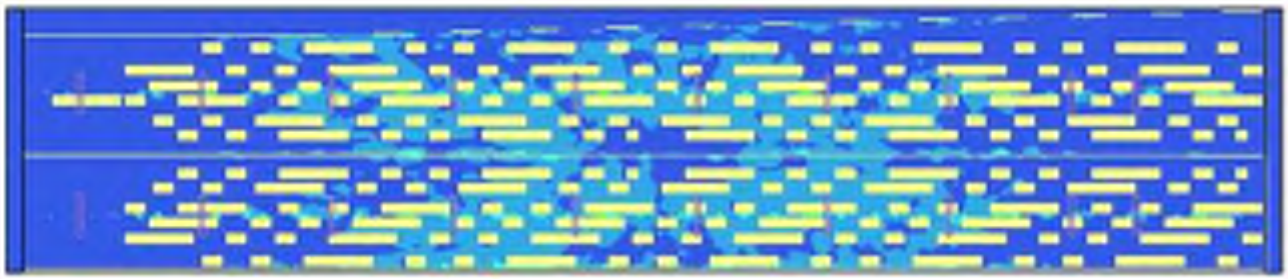
t=540s



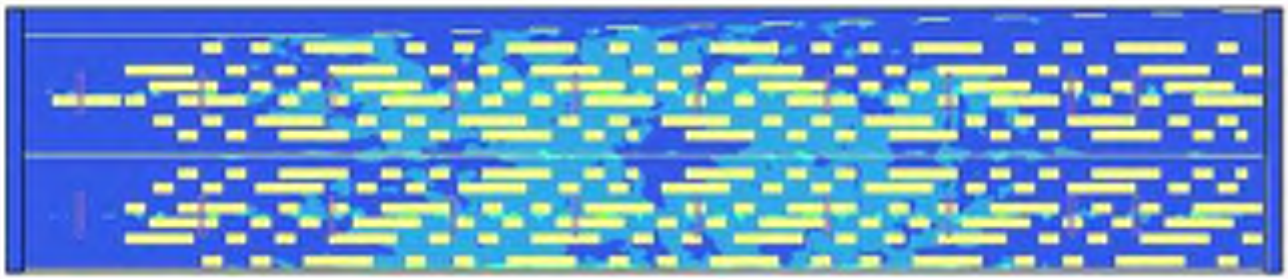
t=570s



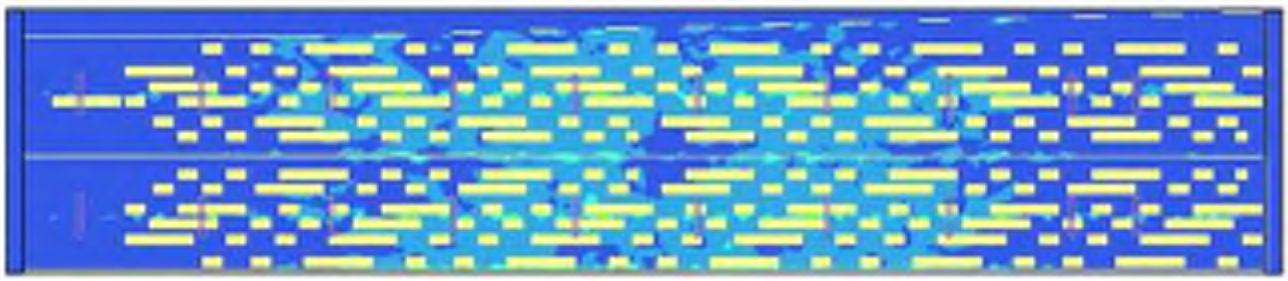
t=600s



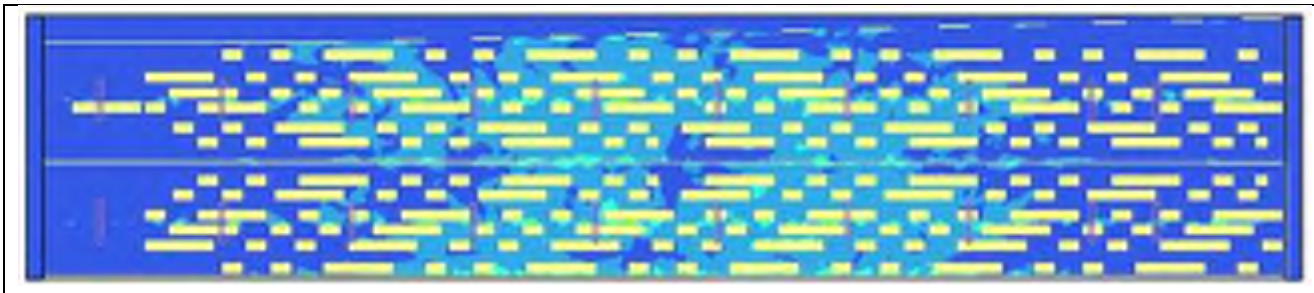
t=720s



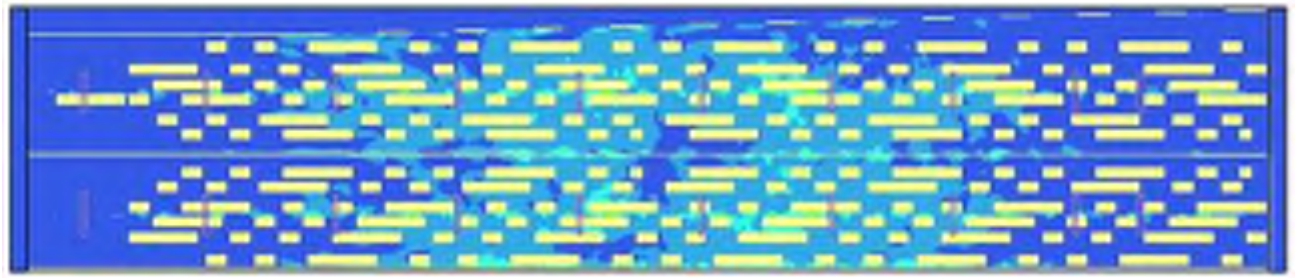
t=840s



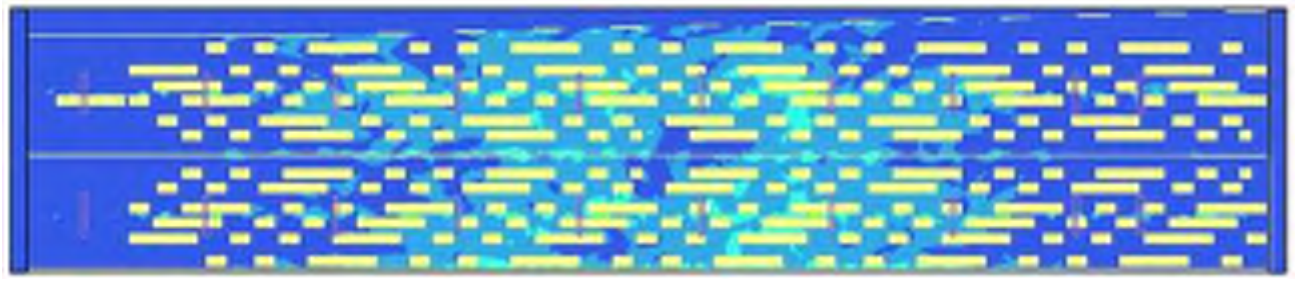
t=960s



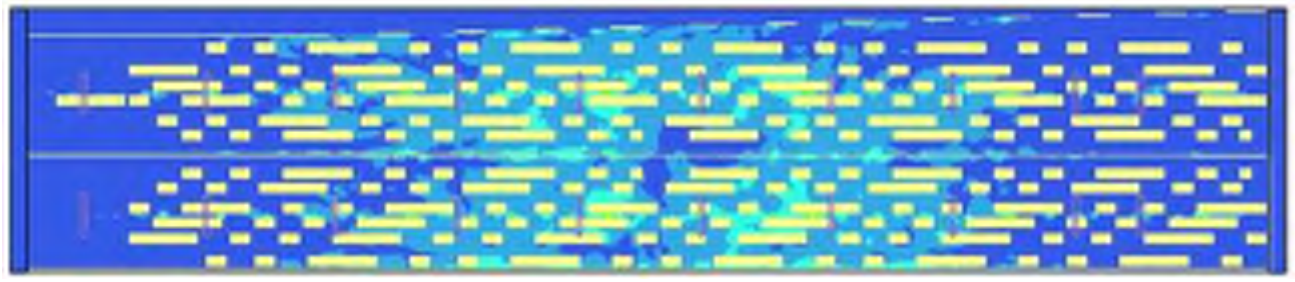
t=1080s



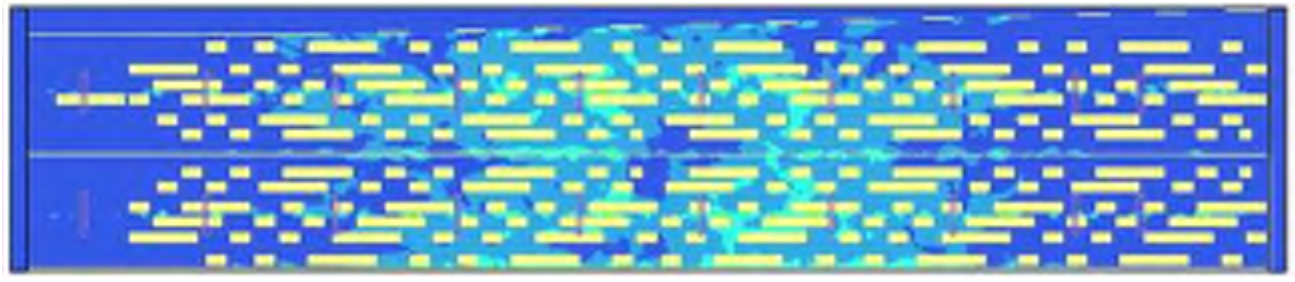
t=1200s



t=1320s



t=1440s



t=1560s

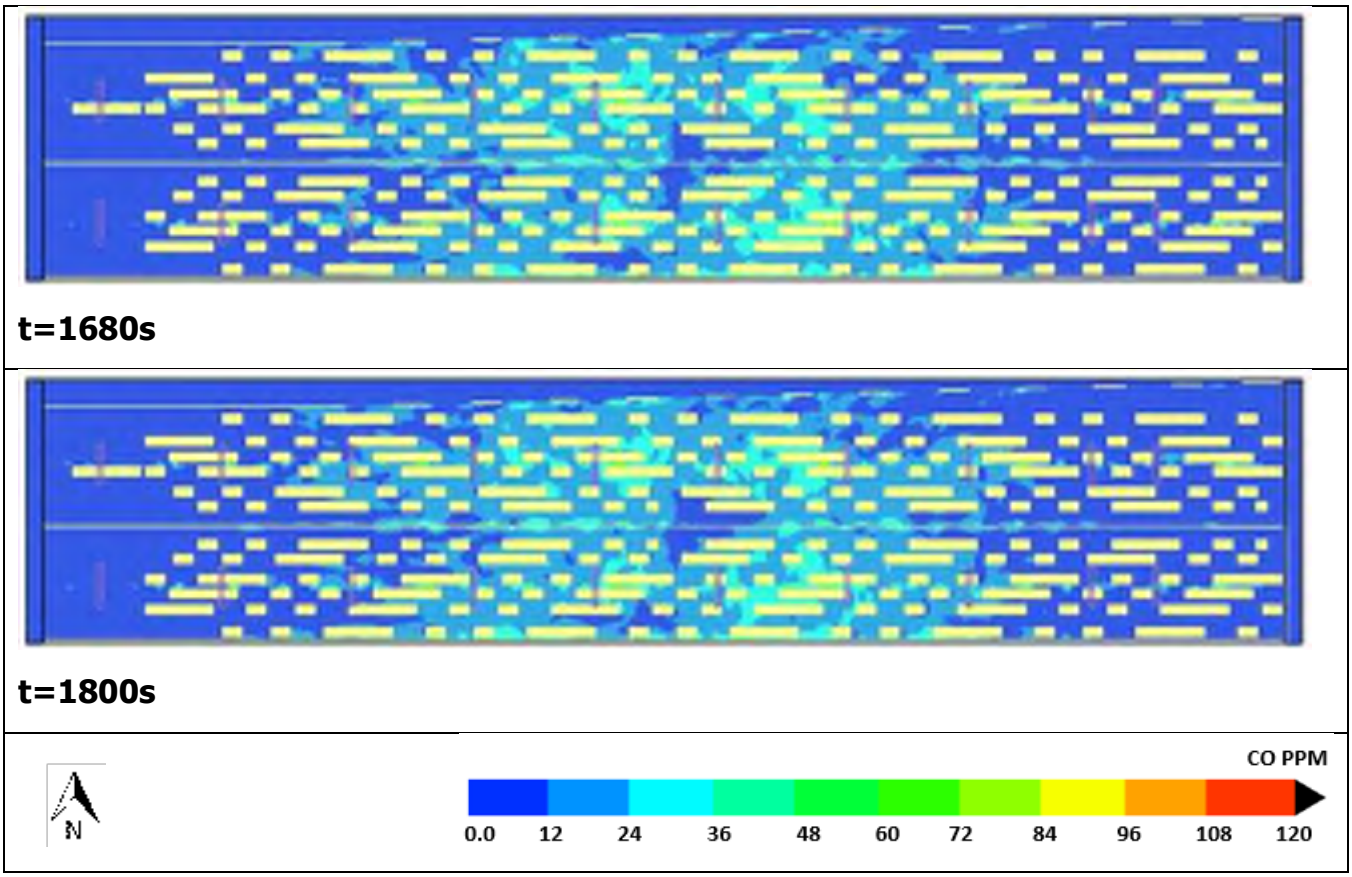
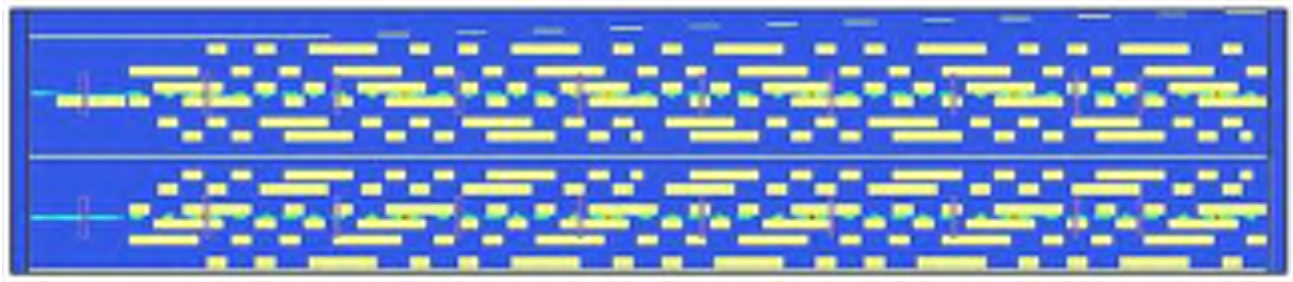


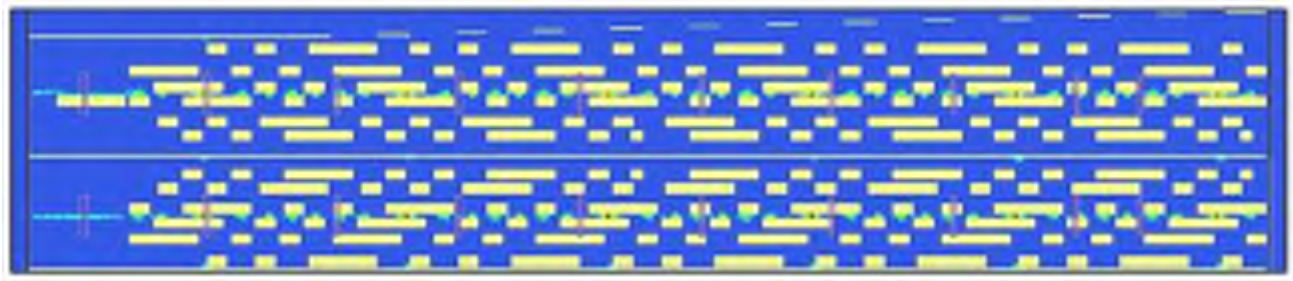
Figure B-3. CO ppm concentration on a plane 8.2 ft above Tunnel floor (350 kcfm exhaust after 120s from start of fire)

PM Extinction Coefficient:

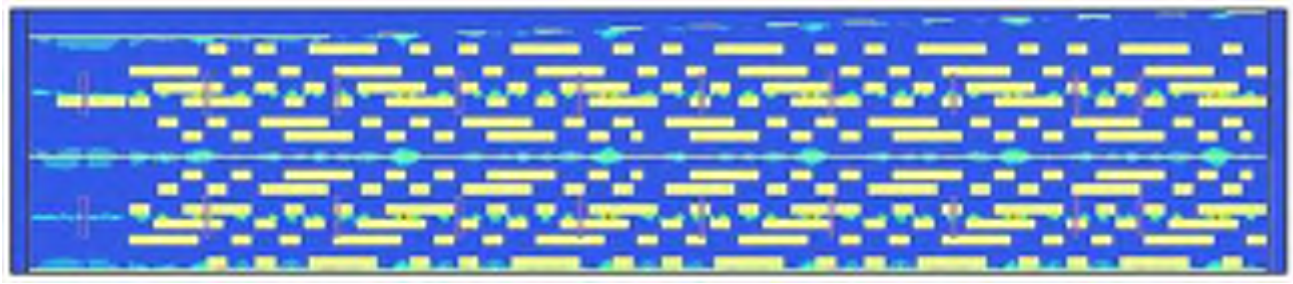
t=0s



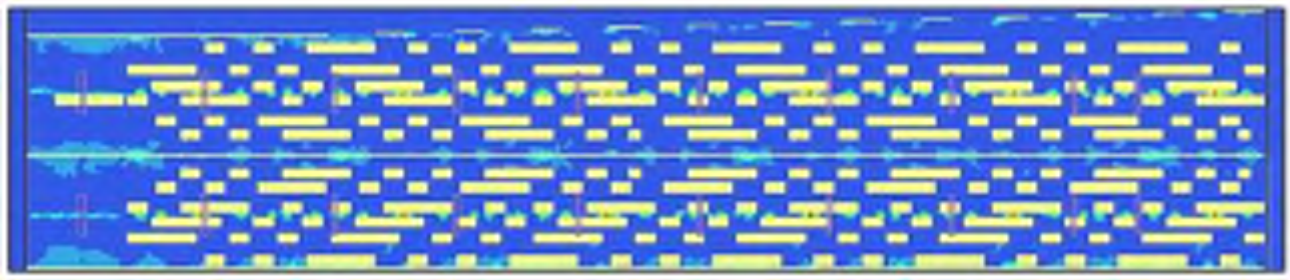
t=30s



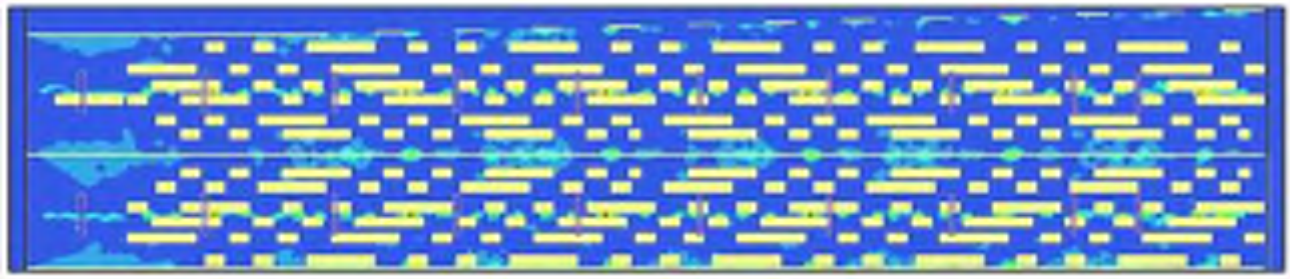
t=60s



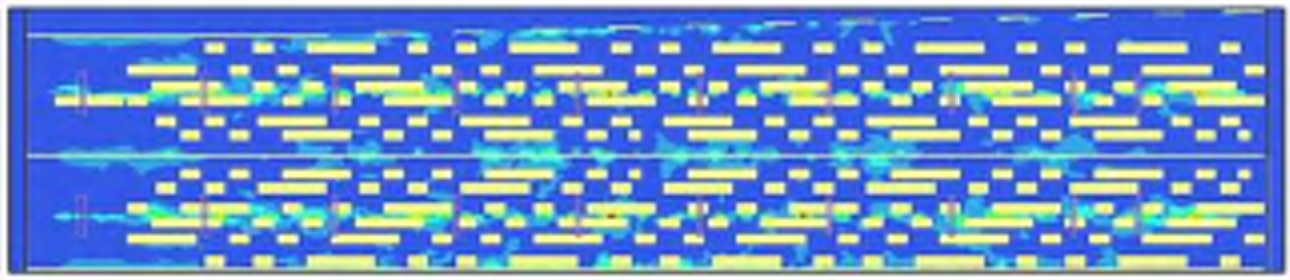
t=90s



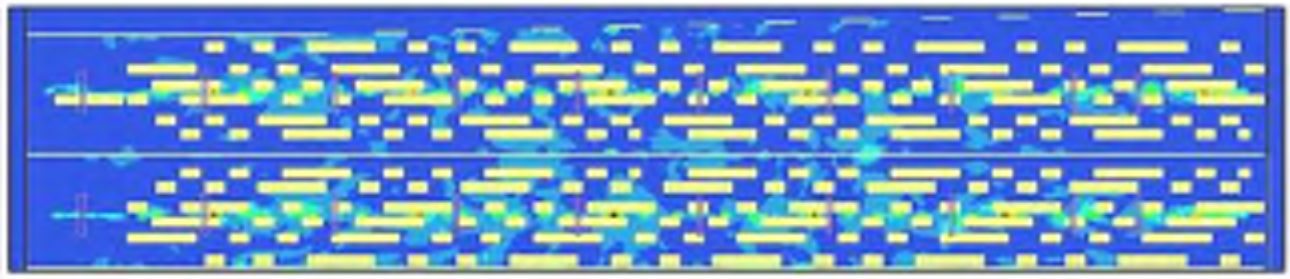
t=120s



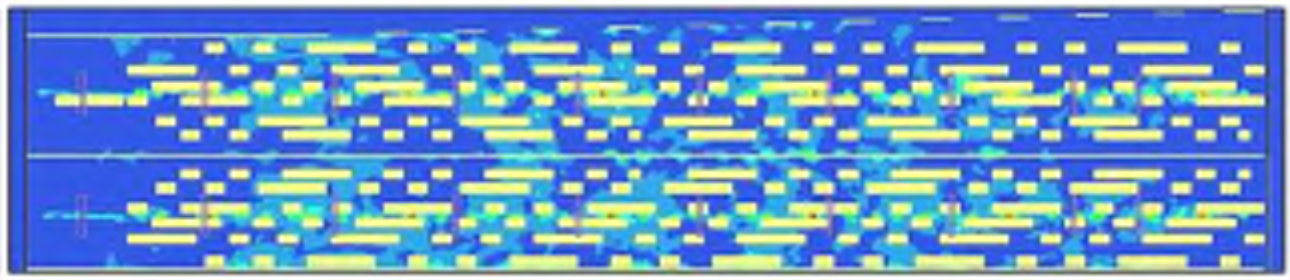
t=150s



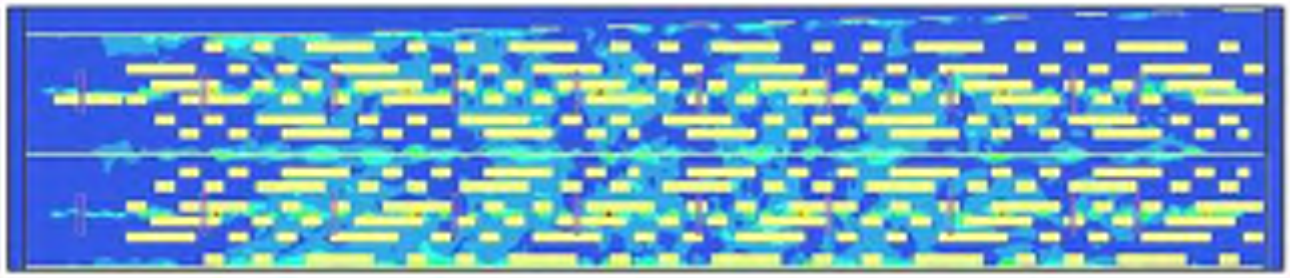
t=180s



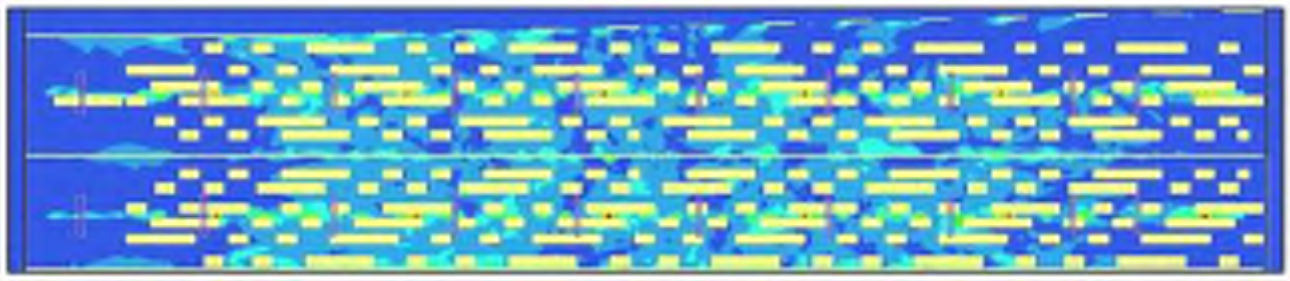
t=210s



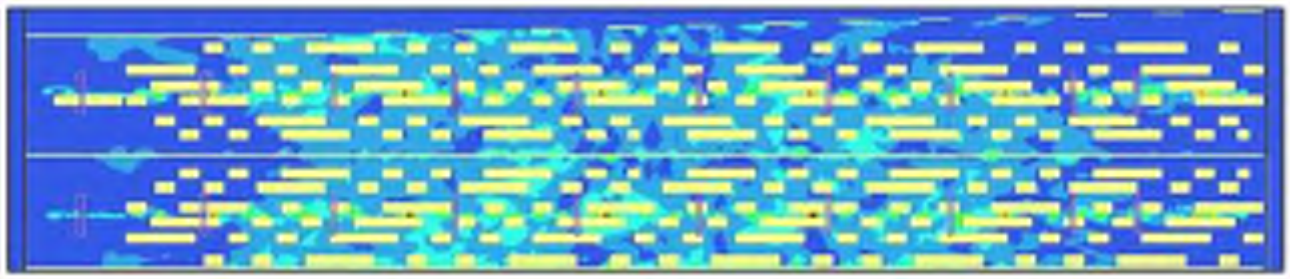
t=240s



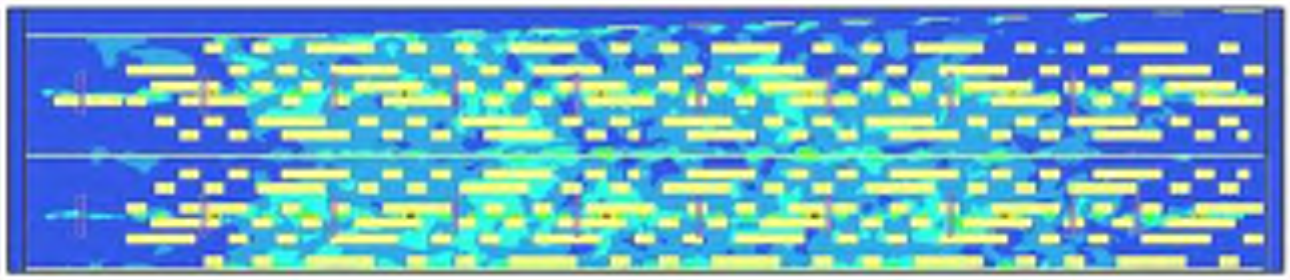
t=270s



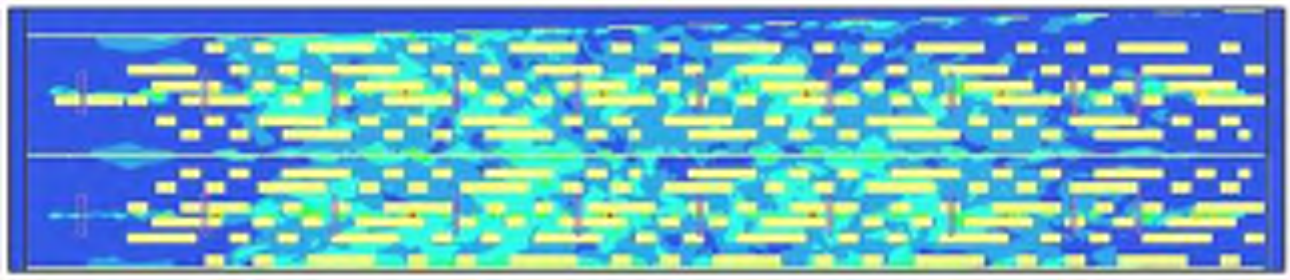
t=300s



t=330s



t=360s



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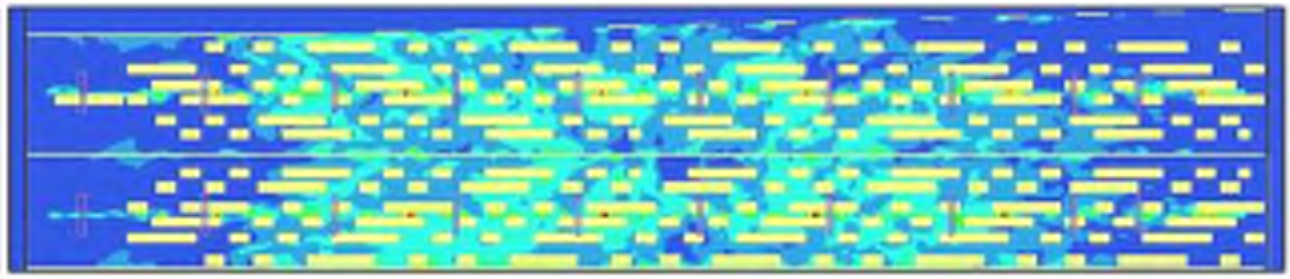

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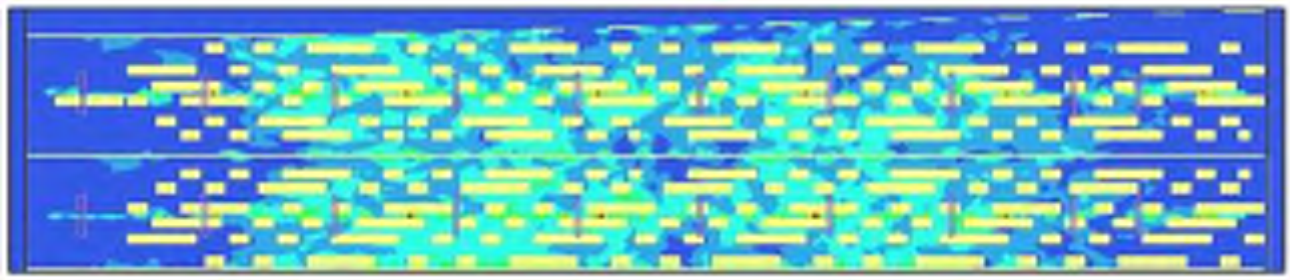

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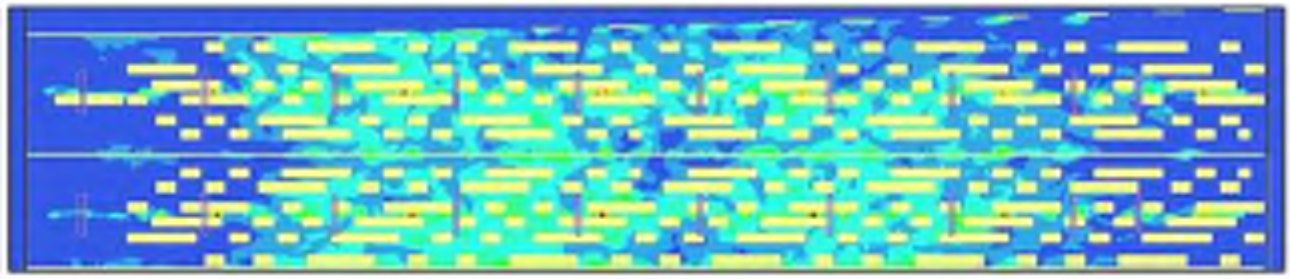

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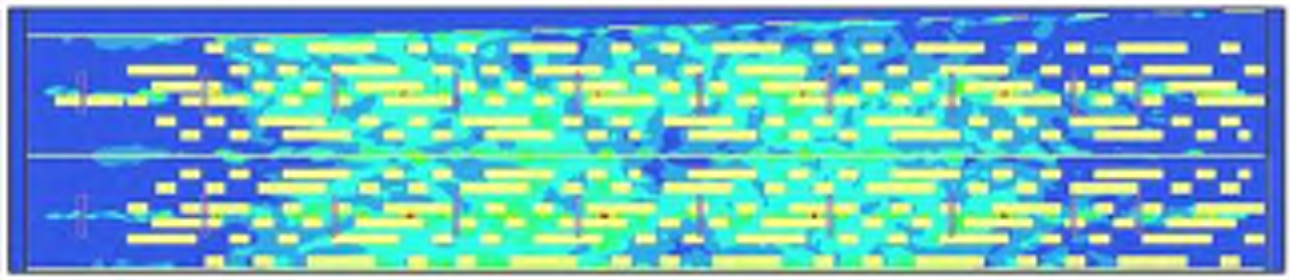

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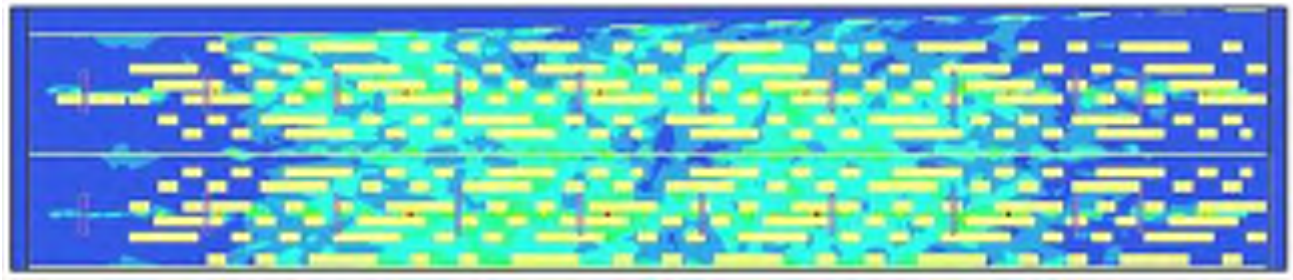

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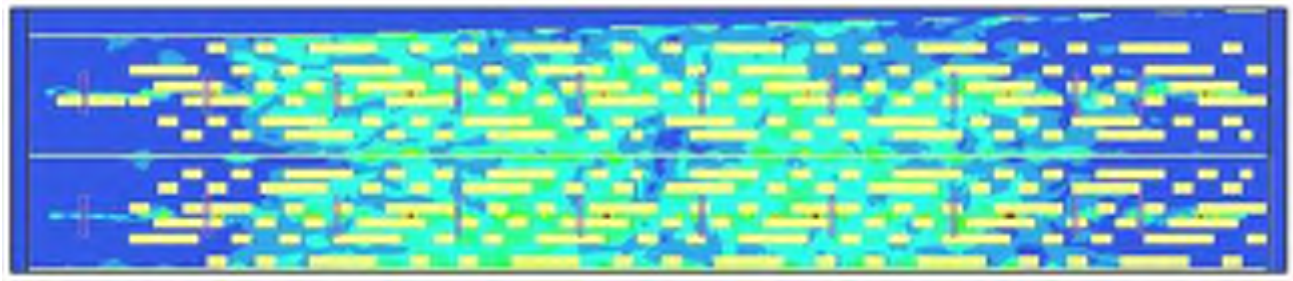

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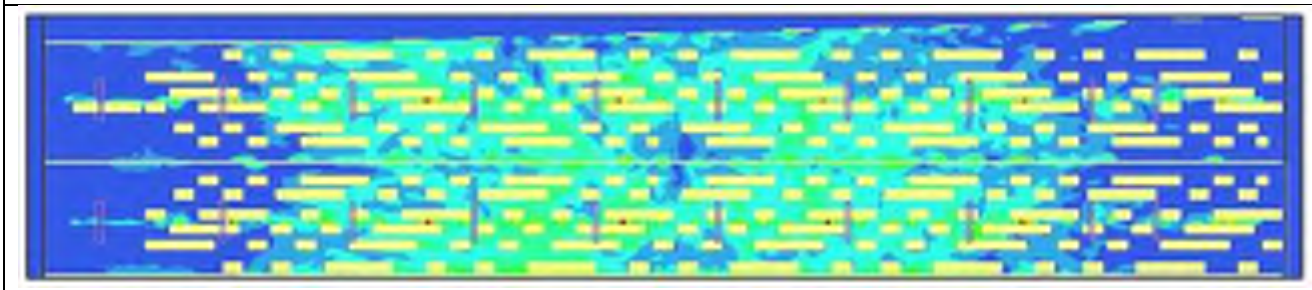

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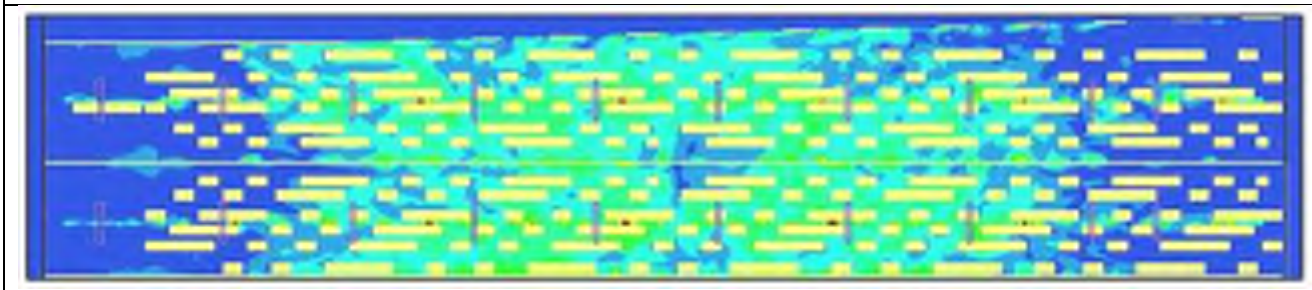

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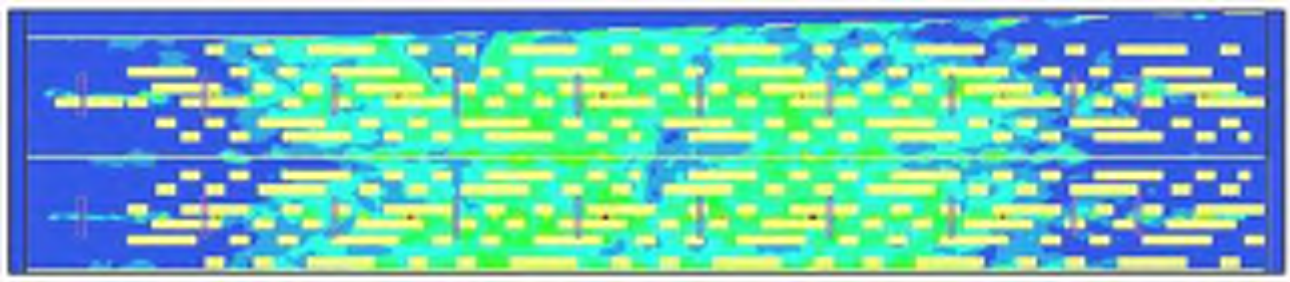

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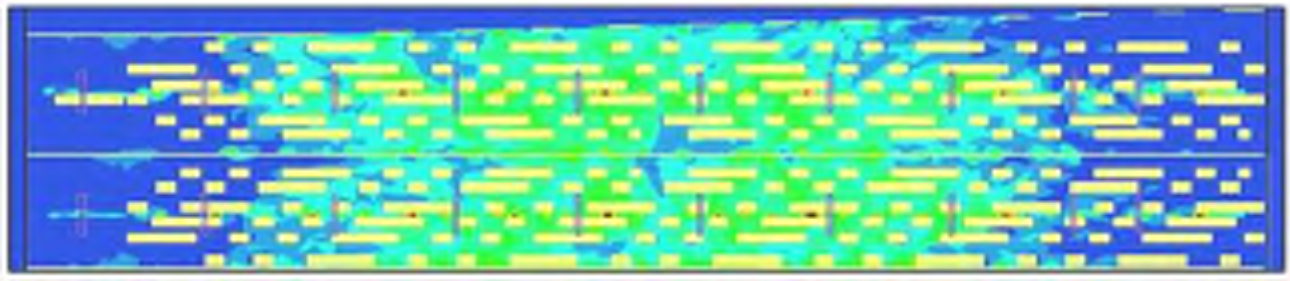

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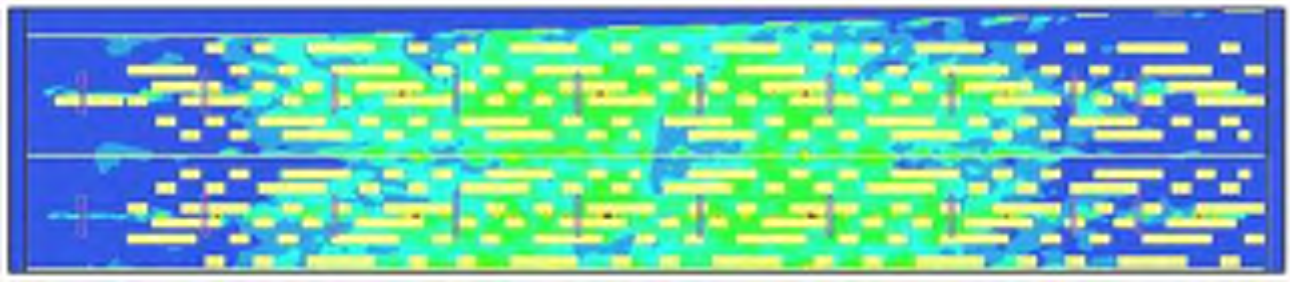

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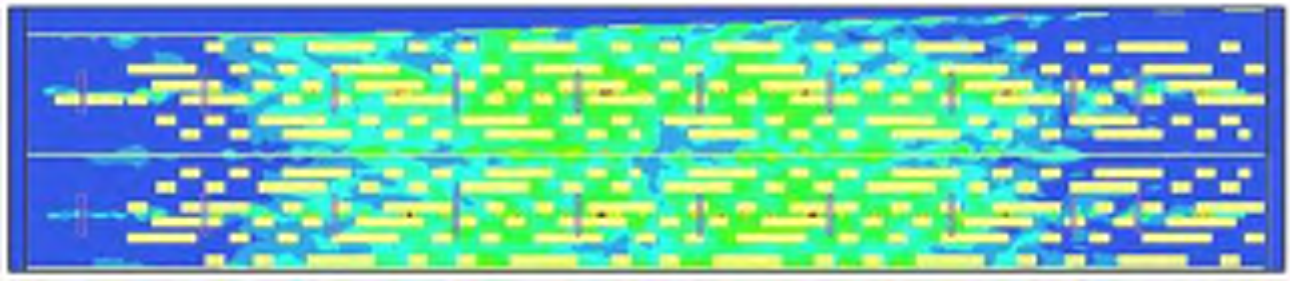

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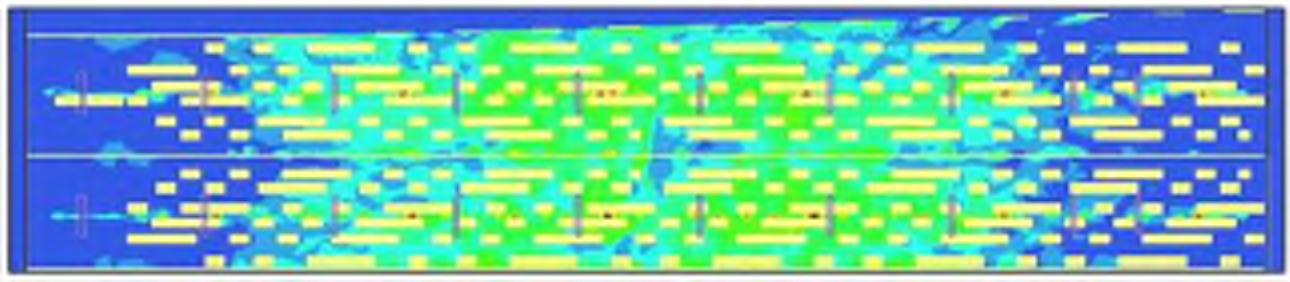


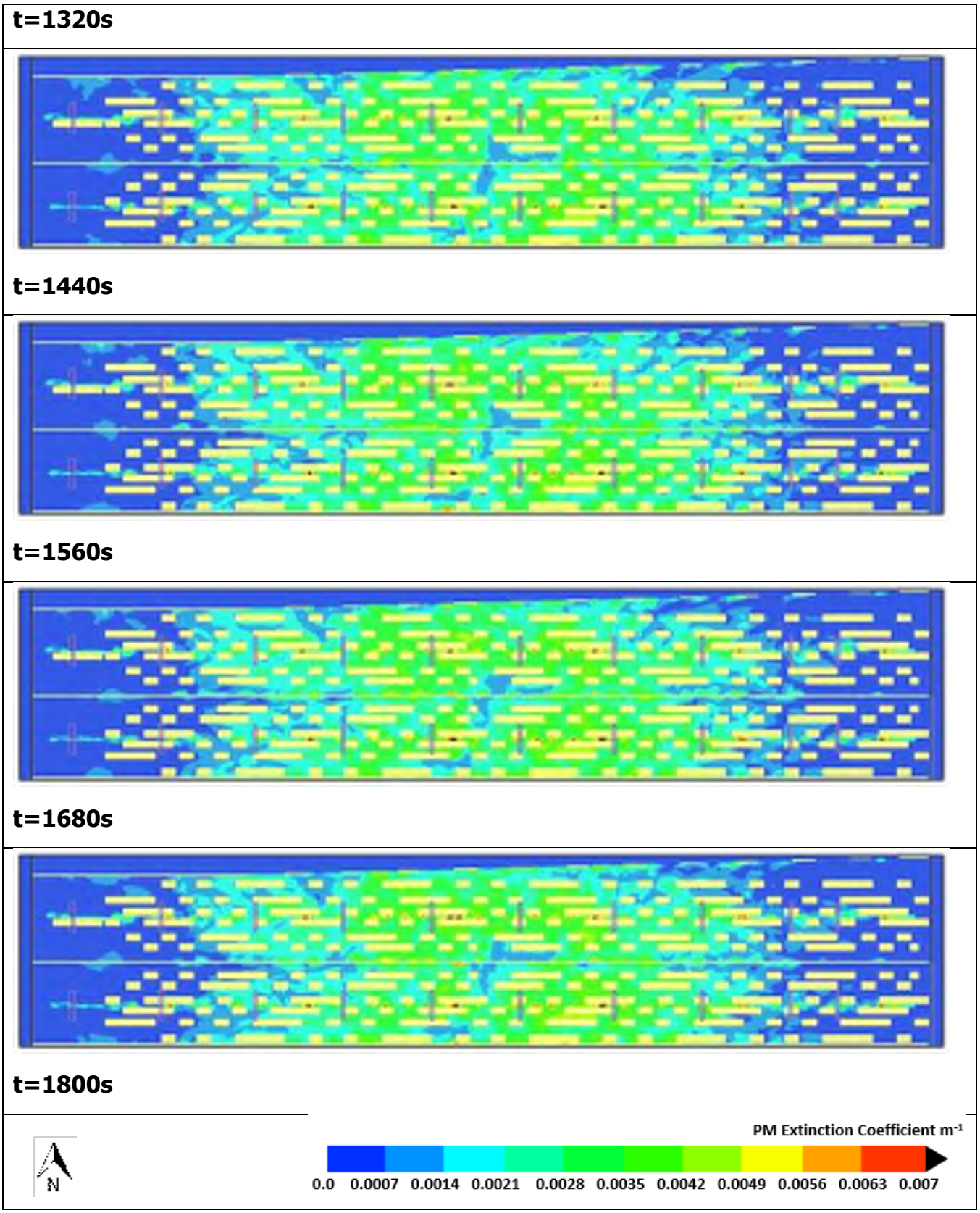


Figure B-4. PM Extinction Coefficient on a plane 8.2 ft above Tunnel floor (350 kcfm exhaust after 120s from start of fire)

Appendix C - Calculation Time for Egress

In Appendix C, the approximate time for egress during a fire emergency is calculated. The fire is located at the west portal.

Based on NFPA 130, the walking speed of passengers is assumed to be 2.2 ft/s. NFPA 130 is used as no guidance on walking speed is given in NFPA 502. As a comparison, based on Table 4.2.2 (Fire Protection Handbook, NFPA, 2008), the average walking speed of adult with walking disability is 2.58 ft/s.

It is assumed that there are 3 exit crosspassage doors in the tunnel. Two exit doors are assumed to be located at each portal and the other exit is assumed to be located at the center. However, the crosspassage door at the west portal is unavailable due to proximity to the fire. Also, the cross passage at the east portal is assumed not to be in use since the passengers instead choose to use the east portal to exit. Hence, only the center crosspassage door is used in this egress calculation.

Since the tunnel is 1000 ft in length, the distance to the nearest exit is 500 ft or less for any passenger.

The maximum travel time to the nearest exit (either the portal or the cross passage door) using a walking speed of 2.2 ft/s is $\frac{500\ ft}{2.2\ ft/s} = 3.8\ min$

Assuming there are 2 passengers per vehicle in the tunnel, there would be a total of 444 passengers in total in the 6 lanes of the tunnel. It is assumed that 150 passengers exit through the portal and the remaining 294 passengers exit using the center cross passage door.

It takes 3.8 min for the farthest person picking the exit to reach the exit (either the east portal or the door). There is no queuing for the passengers choosing to exit using the east portal, so all the 150 passengers that choose to exit through the east portal exit within 3.8 minutes.

But, the exit capacity of the center crosspassage exit door is limited by the width of the door. Based on Equation 4, 4-60 of the Fire Protection Handbook, NFPA, 2008, the maximum specific flow through the door can be calculated. For a 36” door, the effective width of the door is 24” or 2’ and the maximum specific flow is 24 persons/min/ft or 48 persons/min.

The number of people that exit the crosspassage door during 3.8 min is $48\frac{persons}{min} * 3.8\ min = 182.4$ persons=> 182 persons.

Considering the limited width of the door that would result in queuing at the door, the additional time to exit the door is calculated based on the maximum specific flow calculated earlier.

The additional time taken for the remaining 112 persons (294 persons-182 persons) due to queuing to exit through the crosspassage door is $\frac{112\ persons}{48\ persons/min} = 2.3\ min$

Hence, total time for evacuation = 3.8 min+ 2.3 min = 6.1 min

Hence based on egress through 1 crosspassage door and the east portal, a total of 6.1 minutes is needed to evacuate the passengers from the tunnel during a fire emergency at the west portal.

Central 70

DATE: August 31, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 26.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 26.0 was reviewed by the Procuring Authorities prior to the August One-on-One Meetings and an initial response was sent to you on August 4, 2016. As discussed during the August One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Conceptual ATC. The ATC proposes an alternative ventilation approach in the Central 70 Cover 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 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.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Conceptual ATC Submission. The Procuring Authorities ask that the following items are addressed in the Detailed ATC submission:

1. The exhaust duct adjacent to the tunnel appears to require additional underground space. The duct shall be required to fit within the original construction limits with no increase these limits.
2. In congested traffic, this proposal would have emissions from both carriageways exhausted at a single point. Provide a discussion on how Front Range Mobility Group would address stakeholders concerns

regarding this point discharge. Support for a point discharge on the north side of the Cover near the elementary school will be very difficult to garner.

3. Any required environmental impact study associated therewith will be the sole responsibility of Front Range Mobility Group.
4. Demonstrate reliable control of air quality in both carriageways using a single system.
5. The ATC has asserted that a safe egress environment can be maintained during the evacuation period. What period has been considered? If it is short, e.g. on the order of a few minutes, is the assumption that the fire does not reach its full intensity? Can the ventilation system be used to assist fire-fighter intervention? Has the effect of wind been considered?
6. Please consider flow velocities in the ventilation ducts, corresponding hydraulic resistance, fan capacity and plant room size.
7. Front Range Mobility Group would need to provide testing to demonstrate the adequate performance of the system.

The Procuring Authorities continue to reserve the right to modify the above evaluation and/or discuss the Conceptual ATC with FHWA and the City of Denver.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: July 13, 2016

Central 70 Project RFP: ATC Submission No. 26.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

ATC is being submitted to propose an alternative ventilation approach in the Central 70 cover section. The ATC proposes the use of a semi-transverse mechanical ventilation system with exhaust air ducted from the tunnel via dedicated exhaust ductwork and fan(s) with fresh air drawn into the tunnel via the portals. The ventilation equipment would be located in a plant room located below grade at the north side of the east portal. Fire rated, low leakage dampers would be located above the roadway in order to provide local control and CFD analysis performed confirms that it is possible to maintain a safe tenable egress environment and prevent smoke propagation outside of the ventilation zones during the evacuation time.

This approach also provides improved control during normal operations when pollution from vehicle emissions would initiate a ventilation response for the purpose of air quality control. Using a variable frequency drive motor on the fan, air can be exhausted from openable dampers above the roadway, the pollution sensors would be used to automatically modulate damper openings so that air in the areas with the highest concentrations of pollutants is exhausted.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

- RFP Schedule 10, Section 12 Cover MEP System
- 10B-10-14-01 Cover and Swansea Design Development Set Addendum 2
- Tunnel Mechanical Drawings– there are no cover mechanical drawings showing the ventilation equipment, however, RFP Structural Plans: Sheet 359, Sheet 360 and Sheet 361.
- FEIS
- Schedule 10, Section 1.3b

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

The ATC would be implemented along the length of the cover section of I-70 and constructed as part of the project. The ATC would replace jet fans identified in the Addendum 2 RFP documents with a vane axial fan(s) located in a plantroom below grade.

Maximize Scope

This ATC improves the ventilation design by removing the emergency mechanical ventilation fans above the roadway in the covered portion of the highway.

Minimize Maintenance

The removal of the emergency mechanical ventilation system from the covered portion of the highway will remove long term maintenance issues associated with the emergency ventilation fans and require less electrical power. The covered portion will be mechanically ventilated during normal, congested and emergency periods.

Enhance Community Values and Project Benefits

As a result of removing the emergency mechanical ventilation fans above the roadway, the maintenance requirements and resulting lane closures are significantly reduced. Maintenance of fan equipment can be

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

undertaken from a much safer environment within plant rooms.

During normal or congested operations vehicle emissions are not ventilated to atmosphere via the tunnel portals, with the potential for recirculation. Exhaust air can be ventilated via dedicated exhaust vents and can be more effectively controlled.

Protect Safety of Work Force and Public

Jet Fan Maintenance - The ATC removes the need for lane closures and reduces the working time of staff within the covered roadway.

Minimizes Impacts to travelers and nearby communities

The ATC reduces potential lane closure requirements as a result of equipment failure and maintenance.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

ATC requires plant room access from either the roadway or from above. Maintenance access requirements for routine equipment maintenance would require a standard door access route. For overhaul or replacement of the fan a means of removal and replacement would require suitably sized access doors or hatch from above.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

This ATC removes the jet fans in the covered portion of the Central 70 project, simplifies the structure girder requirements for the cover, and reduces the need to lower the tunnel to provide clearance for the jet fans system. Emergency power requirements are also reduced. We anticipate a substantial CapEx and O&M savings under $8.0M as a result of this ATC.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

No impacts.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

See the attached PDF drawings showing the proposed concept.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

See below a partial list of projects utilizing the alternative ventilation method proposed with this ATC.

- Fort McHenry Tunnel, Baltimore, MD – Transverse
- Columbus Center, Boston, MA - Transverse
- Baltimore Harbor tunnel, Baltimore, MD – Transverse

- Lincoln Tunnel, NJ/NY – Transverse
- Thomas P. O'Neil Jr. Tunnel, Boston, MA. (Central Artery - The Big Dig project) – Transverse
- Ted Williams Tunnel , Boston, MA.(Big Dig Project) – Transverse
- Holland Tunnel, NYC, NJ/NY– Transverse
- Queens Midtown Tunnel, NYC, NY– Transverse
- Brooklyn Battery Tunnel, NYC,NY– Transverse
- Mersey Kingsway Tunnel, Liverpool, Merseyside, UK – Semi Transverse
- Tyne Tunnel, Newcastle Upon Tyne, UK – Semi Transverse
- Dartford Crossing Tunnel (West Tunnel), Kent/Essex, UK - – Semi Transverse
- Dartford Crossing Tunnel (East Tunnel), Kent/Essex, UK – Semi Transverse
- Cointe Tunnel, Belgium – Semi Transverse
- Siaix Tunnel, France – Semi Transverse
- Tranchee Remise de Verrou Tunnel, France – Semi Transverse
- Ambroise Pare Tunnel, France – Semi Transverse
- Front de Mer Tunnel, France – Semi Transverse
- Vieuxport Tunnel, France – Semi Transverse
- Parc des Princes Tunnel, Paris, France – Semi Transverse
- Orly 1 Tunnel, France – Semi Transverse
- Reine B1 Tunnel - Grandchamps, France – Semi Transverse
- General Holmes Drive tunnel, Sydney – Semi Transverse

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

n/a

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

n/a

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

n/a

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

n/a

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

n/a

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

n/a

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

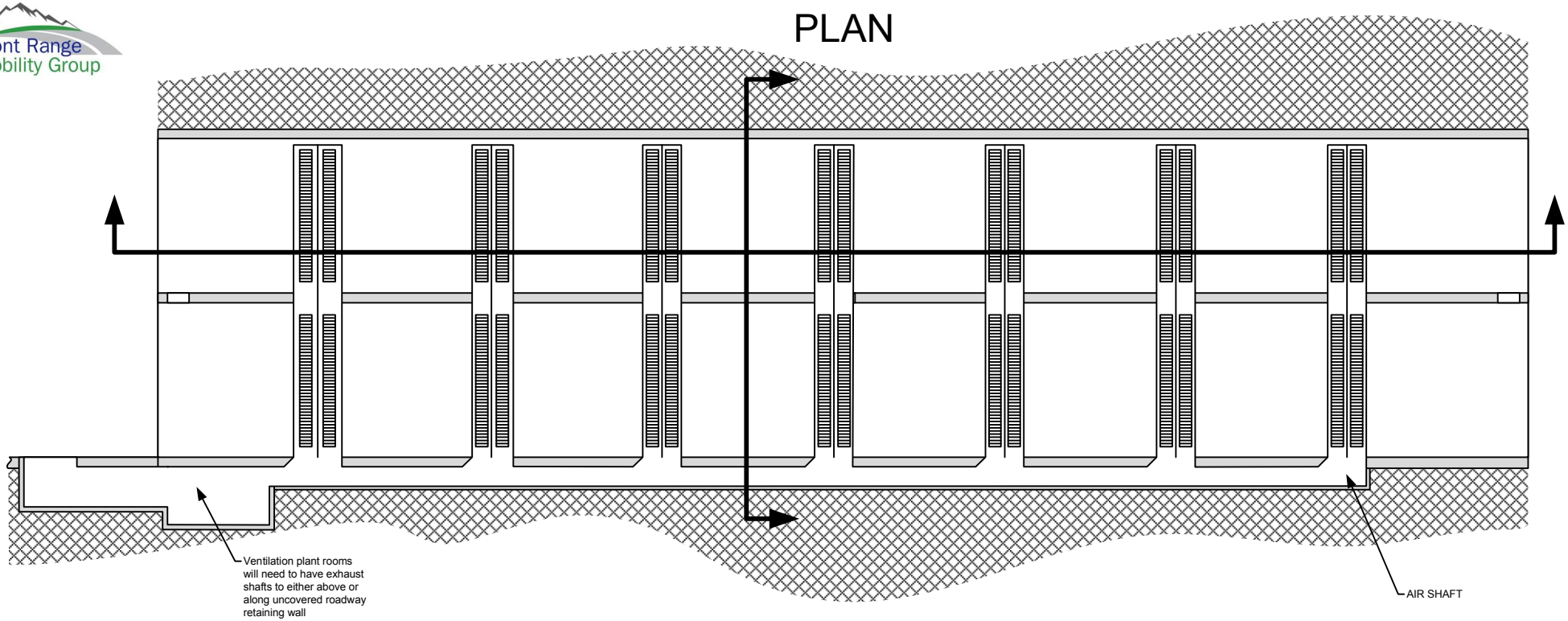
[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 26.0

CONCEPTUAL DRAWINGS

Front Range Mobility Group

PLAN



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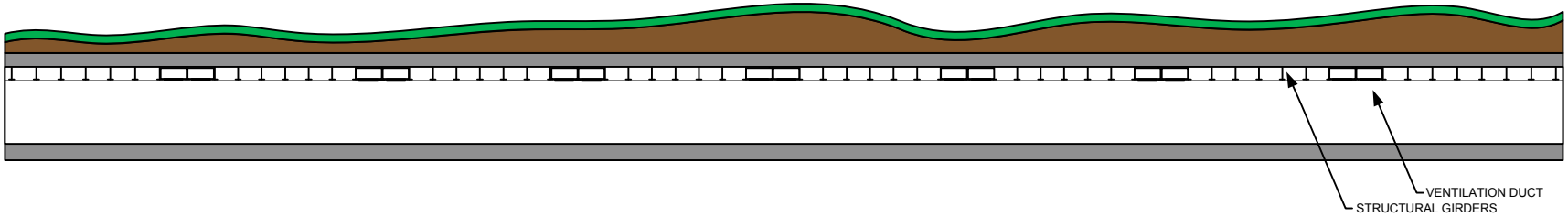
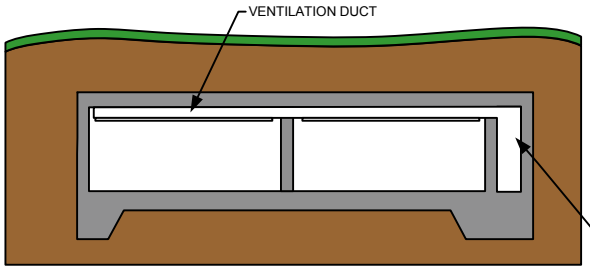




CROSS SECTION

DESIGNED							
DRAWN							
CHECKED							
APPROVED							
NO	DATE	REVISIONS	DRAWN	CHKD	APPVD		
2	5/4/16		BSB				
1	4/15/16		BSB				

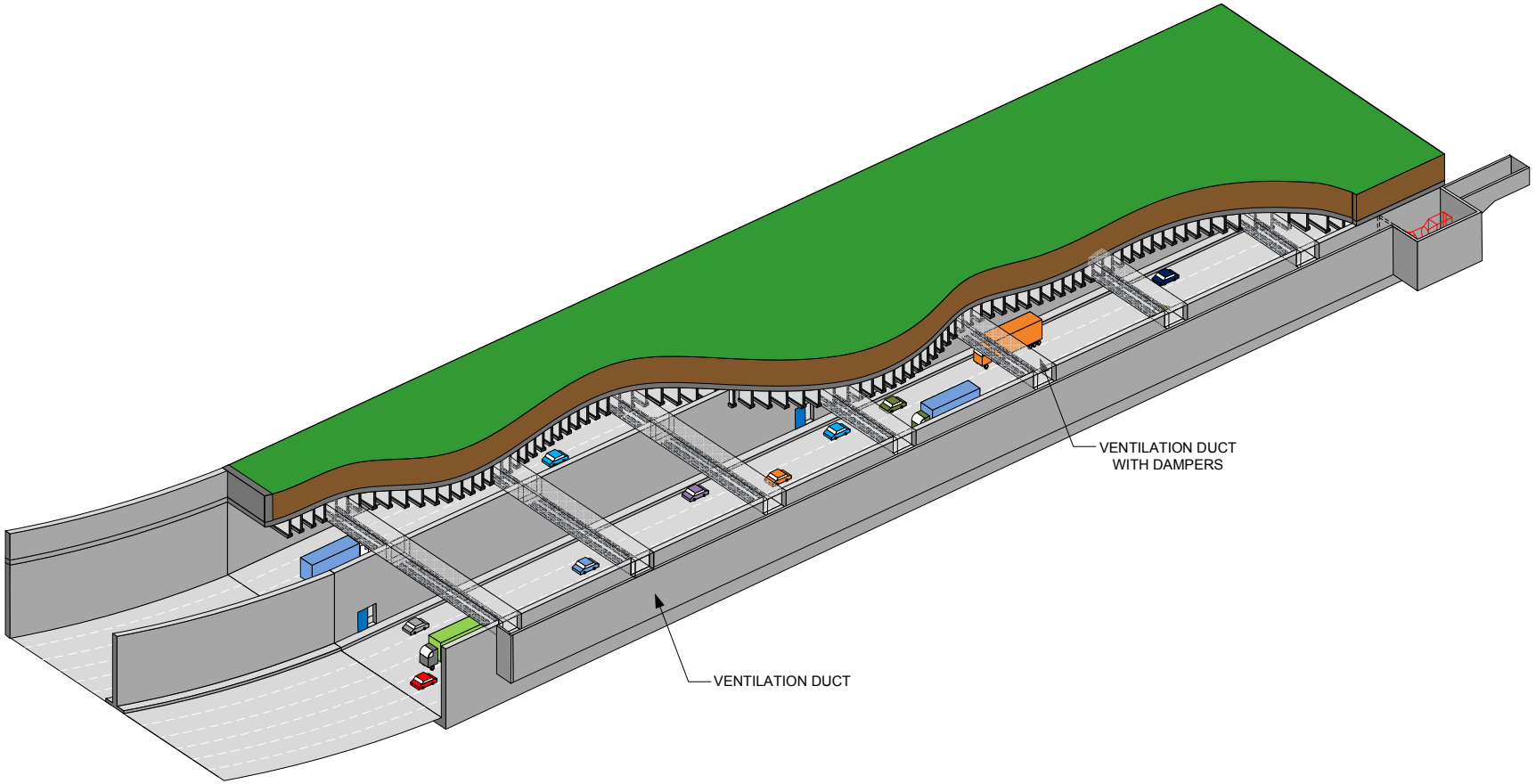
SKETCH - Semi-Transverse ventilation with one plant room

Notes
1. DUCT WORK CAN PENETRATE CENTER DIVIDING WALL, THEREFORE ONLY ONE PLANTROOM IS REQUIRED.
2. NUMBER OF SHAFTS ABOVE ROAD DECK IS INDICATIVE ONLY, SPACING AND SIZE WILL BE DETERMINED BY CFD ANALYSIS.
3. PLANTROOM SIZE AND LOCATION, AND LONGTITUDINAL SHAFTS ARE FOR ILLUSTRATION ONLY, NEITHER HAVE BEEN SIZED.

TITLE
Central -70 Bid Phase
Ventilation Options

CONTRACT NO.	
SCALE: NOT TO SCALE	DATE: June 2016
DRAWING NO.	
SHEET: 2	OF: 9

Front Range
Mobility Group



NO	DATE	REVISIONS	DRAWN	CHKD	APPVD
2	5/4/16		BSB		
1	4/15/16		BSB		

DESIGNED
DRAWN
CHECKED
APPROVED

SKETCH - Semi-Transverse ventilation with one plant room

Notes
1. DUCT WORK CAN PENETRATE CENTER DIVIDING WALL, THEREFORE ONLY ONE PLANTROOM IS REQUIRED.
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3. PLANTROOM SIZE AND LOCATION, AND LONGTITUDINAL SHAFTS ARE FOR ILLUSTRATION ONLY, NEITHER HAVE BEEN SIZED.

TITLE
Central -70 Bid Phase
Ventilation Options

CONTRACT NO.
SCALE: NOT TO SCALE
DATE: June 2016
DRAWING NO.
SHEET: 7 OF: 9

ATC 36

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 36

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 36.1

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 36.1 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 36.1 proposes to reuse a portion of the existing west abutments and pier number 2 of the existing structures for the proposed I-70 bridges over Brighton Blvd.

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 December 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. The final plans shall meet all current design requirements, including the elements of the structure that are to be reused.

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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 8, 2016

Central 70 Project RFP: ATC Submission No. 36.1[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☒ Previously Submitted as Conceptual ATC

☐ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

The Procuring Authorities requested that the following be addressed in the Detailed ATC submission:

1. Provide plan sheets and graphic for the proposed layout.
2. The final plans shall include design criteria meeting all current design requirements for reuse of any portion of the existing bridges

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

This ATC proposed to permit the reuse of a portion of the existing west abutments and piers No, 2 of existing structures E-17-UY and E-17-US for the proposed I-70 bridges over Brighton Boulevard; proposed bridges E-17-AEU and E-17-AEV.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

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

- Schedule 10, Section 13.5.2 Table 13-2 Action for bridges structures

This table indicates removal of the existing bridges (E-17-UY and E-17-US) and complete reconstruction with the new bridges (E-17-AEU and E-17-AEV)

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

The existing bridge span carrying I-70 over Brighton Boulevard was constructed in 2000. This span and substructure units were designed for MS22 live load, the metric equivalent of HS25 live load using the load factor design method per the former AASHTO Bridge Standard Design Specifications. HS25 live load slightly exceeds the HL93 live load specified in the current AASHTO LRFD bridge design specifications.

Furthermore, the configuration of the proposed new structures will be a two span configuration with a center pier; dividing the existing one span bridge into two shorter spans to achieve a shallower superstructure depth. The inclusion of this additional pier will significantly lower the dead and live load reactions on the existing west abutment and existing pier No. 2 on the east side of Brighton Boulevard.

Given the above, the existing substructure units and foundations will receive significantly reduced loads than they are currently supporting for the current configuration. As such, the portions of the existing Brighton Boulevard bridge proposed for reuse and the entire reconfigured bridge, new and existing portions, will be designed for HL93 bridge loading per the current AASHTO LRFD specifications.

This ATC proposes to re-use portions of the existing abutments and pier and widen and reconfigure them as necessary to accommodate the proposed new two-span superstructure. This will result in lower construction costs for the removal of the old structure and construction of the proposed new structure.

This ATC is consistent with accepted best practice to re-use and revise, rehabilitate and incorporate existing bridge elements into new work to achieve effective use of the existing structure as well as better economy and lower cost for the proposed project improvement.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

and analysis of any such impacts that are not reflected in the final EIS.

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

There are no social or operations and maintenance impacts associated with this ATC.

Durability and long-term maintenance requirements are not impacted. The existing substructure elements proposed for re-use are less than 20 years old and in good condition. Any minor deficiencies will be repaired and restored to like new condition during widening of the substructure units and reconstruction of the superstructure.

Community impacts and traffic congestion during construction are potentially reduced due to a shorter construction duration attributed to less time needed for existing substructure removal and proposed structure replacement.

Environmentally, this ATC achieves a reduction in impacts by re-using and incorporating existing elements of the current facility into the new project lowering demand for new replacement materials.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

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

A reduction in construction cost for proposed new structures E-17-AEU and E-17-AEV will be realized by not having to completely remove the existing substructure units and completely reconstruct them for the new bridges.

We anticipate a substantial CapEx and O&M savings of $ 700,000 as a result of the approval of this ATC associated with partially reutilizing the existing substructure at abutment 1 and pier 2 and reduction of the demolition and earthwork activities:

- Re-use existing caissons: $450,000
- Re-use existing substructure: $150,000
- Demolition Reduction: $ 50,000
- Earthwork Reduction: $ 50,000

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

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

This ATC proposal improves and shortens the construction schedule by needing less time for existing bridge removal and subsequent replacement bridge reconstruction. FRMG is estimating about one month in construction time saving associated with fewer activities.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

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

Conceptual drawings showing the layout of the proposed Brighton Boulevard structure with reuse of portions of the existing abutment and pier are shown on Attachment A.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

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

It is common practice to widen and re-use portions of or entire existing bridges in situation such as this where the existing structure is in good condition.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

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

As requested in the Department's response to Conceptual ATC Submission 36.0, concept bridge drawings showing the layout of the proposed Brighton structure with reuse of portions of the existing abutment and pier and designated design live loading of HL93 are included as Attachment A.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

FRMG has analyzed this ATC from a risk perspective and believes that there are no risks associated with the approval of this ATC because the dead and live loads on the existing abutment and pier foundations that will be reused will be significantly less after reconfiguration (less than 50%) than these elements are currently satisfactorily supporting.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

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

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

There is no Additional Right-of-Way expected to be required to implement this ATC.

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

There are no third party and Governmental Approvals and/or Design Exceptions required for implementing this ATC.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

Schedule 10, Section 13.5.2 Table 13-2 Action for bridges structures

Upon approval of this ATC, Schedule 10, Section 13.5.2 Table 13-2 would be modified as follows to indicate that replacement structures E-17-AEU and E-17-AEV will incorporate a portion of the existing west abutment and Pier No. 2 of structures E-17-UY and E-17-US respectively.

Table 13-2 Actions for bridge structures

Existing Structure No.	New Structure No.	Structure Location and Description	Action
E-17-UY E-17-US	E-17-AEU E-17-AEV	I-70 westbound over Brighton Boulevard I-70 eastbound over Brighton Boulevard	Partial removal and reconstruction Partial removal and reconstruction Construct new superstructure and re-use portion of existing west abutment and Pier No. 2
E-17-FX	N/A	I-70 Viaduct (Brighton Boulevard to Colorado Boulevard)	Removal
E-17-Z	N/A	UPRR Bridge under I-70	Removal
N/A	E-17-AEW E-17-AEX	UPRR over I-70 UPRR Service Road over I-70	New construction New construction
N/A	MISC-E-17-IT	Sanitary Sewer Bridge over I-70 (at York Street)	New construction
N/A	E-17-AEY	York Street over I-70	New construction
N/A	MISC-E-17-IU	Storm Sewer Bridge over I-70 (at York Street)	New construction
N/A	E-17-AEZ	Josephine Street over I-70	New construction
N/A	E-17-AEL	Cover (Columbine to Clayton)	New construction
N/A	E-17-AEN	Fillmore Street over I-70	New construction
N/A	E-17-AEO	Steele Street over I-70	New construction
N/A	E-17-AEP	Cook Street over I-70	New construction
N/A	E-17-AFA	BNSF Market Lead over I-70	New construction
N/A	E-17-AFC	Monroe Street over I-70	New construction
E-17-HU E-17-HT	E-17-AFD	Colorado Boulevard over I-70	Removal and reconstruction
E-17-HY E-17-HZ	E-17-AFF E-17-AFG	I-70 westbound over Dahlia Street I-70 eastbound over Dahlia Street	Removal and reconstruction Removal and reconstruction
E-17-HW E-17-HX	E-17-AFH E-17-AFI	I-70 westbound over Holly Street I-70 eastbound over Holly Street	Removal and reconstruction Removal and reconstruction
E-17-GC E-17-GD	E-17-AFJ E-17-AFK	I-70 westbound over Monaco Street I-70 eastbound over Monaco Street	Removal and reconstruction Removal and reconstruction
N/A	E-17-ADT	N Stapleton Drive over Denver Rock Island Railroad	New construction
E-17-EW E-17-DF	E-17-AFN E-17-AFO	I-70 westbound over Denver Rock Island Railroad I-70 eastbound over Denver Rock Island Railroad	Removal and reconstruction Removal and reconstruction
N/A	E-17-ADU	Quebec eastbound exit ramp over Denver Rock Island Railroad	New construction

Existing Structure No.	New Structure No.	Structure Location and Description	Action
E-17-GA E-17-GB	E-17-AFQ E-17-AFR	I-70 westbound over Quebec Street I-70 eastbound over Quebec Street	Removal and reconstruction Removal and reconstruction
E-17-AER	N/A	I-70 over Sand Creek	Existing bridge previously constructed
E-17-KR	E-17-AFS	Eastbound I-270 over I-70	Removal and reconstruction
E-17-VD	N/A	I-70 over Havana Street	Bridge constructed under Havana Design Build Project
E-17-VE	N/A	I-70 over UPRR spur track (near Havana Street)	Bridge constructed under Havana Design Build Project
E-17-IQ	E-17-AFT E-17-AFU	I-70 westbound over Peoria Street I-70 eastbound over Peoria Street	Removal and reconstruction Removal and reconstruction

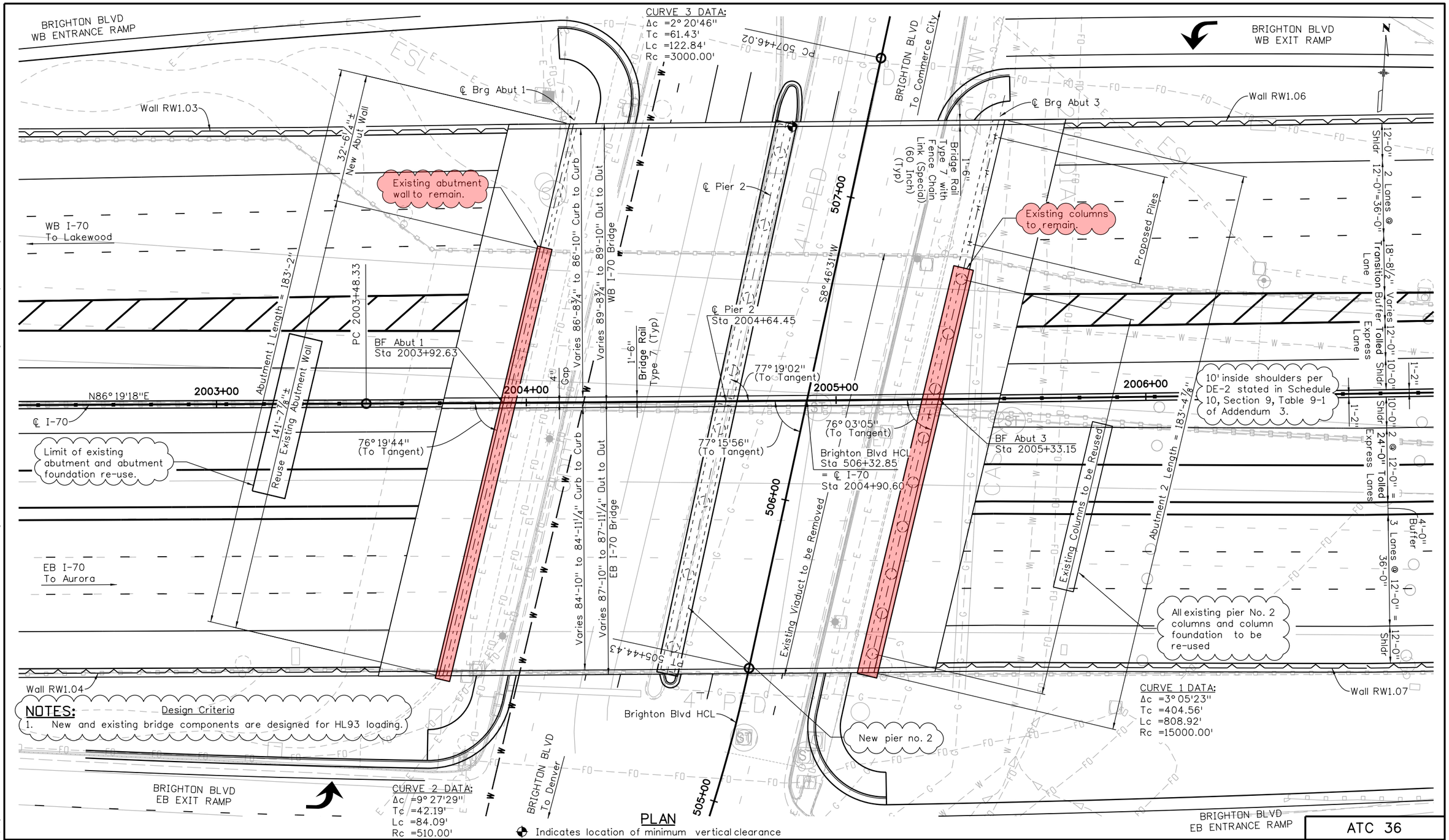
Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 36.1

CONCEPTUAL DRAWINGS



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Vert. Scale:
Unit Information
Unit Leader

Front Range Mobility Group

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

As Constructed
No Revisions:
Revised:
Void:

ATTACHMENT A CENTRAL 70
I-70 OVER BRIGHTON BLVD BRIDGE
GENERAL LAYOUT (1 OF 2)

Designer:	Structure Numbers	E-17-AEU
Detailer:		E-17-AEV
Sheet Subset:	Subset Sheets: 1 of 6	

ATC 36
Project No./Code
Sheet Number

ATC SUBMITTAL

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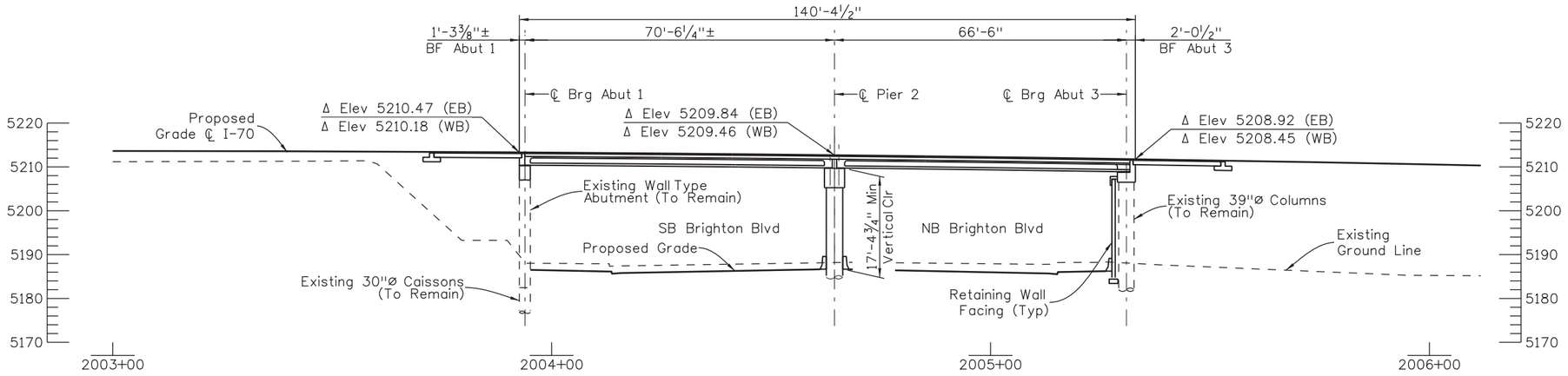

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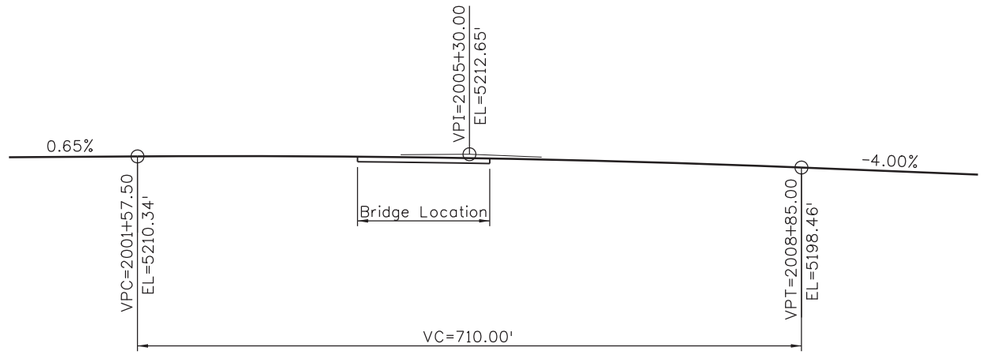

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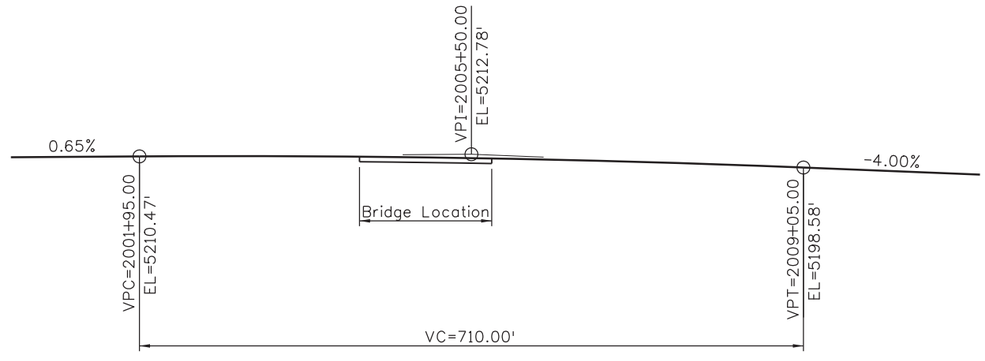

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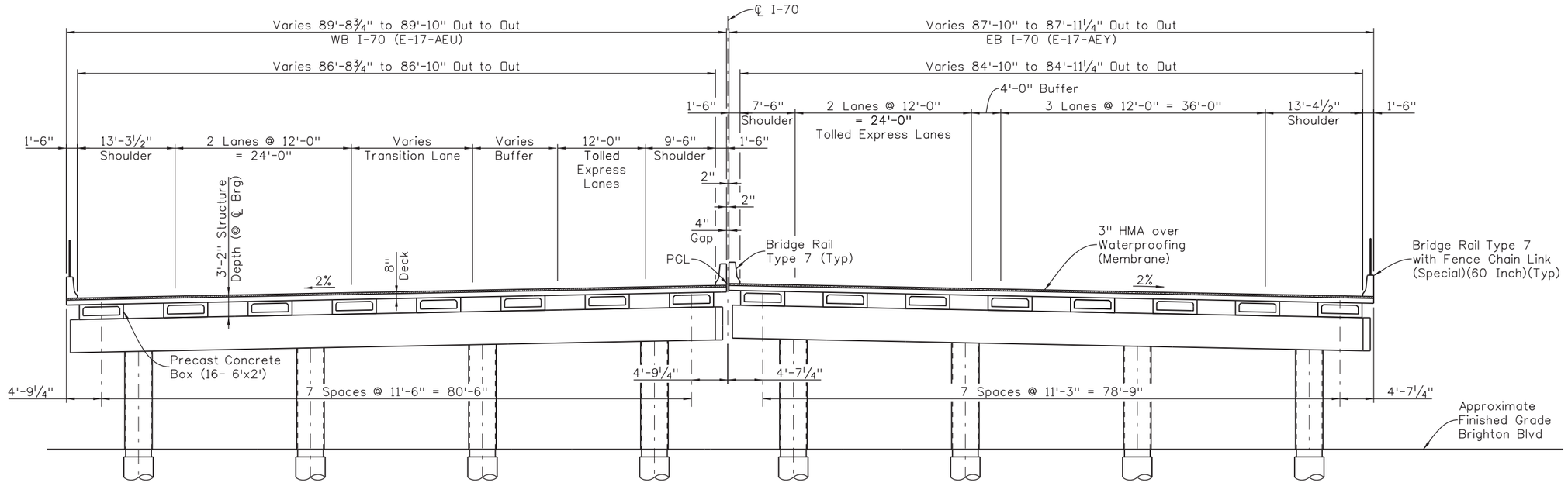

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Vert. Scale:
Unit Information
Unit Leader

Front Range Mobility Group

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Date:	Comments	Init.

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Region 1 KJS

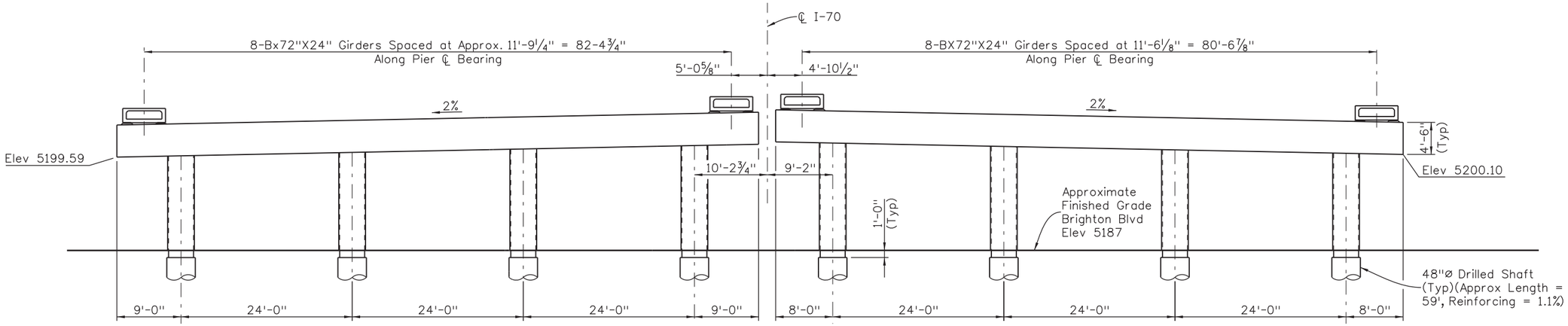
As Constructed
No Revisions:
Revised:
Void:

ATTACHMENT A CENTRAL 70
I-70 OVER BRIGHTON BLVD BRIDGE
TYPICAL SECTION

Designer:
Detailer:
Sheet Subset:
Structure Numbers: E-17-AEU, E-17-AEY
Subset Sheets: 3 of 6

ATC 36
Project No./Code
Sheet Number

ATC SUBMITTAL



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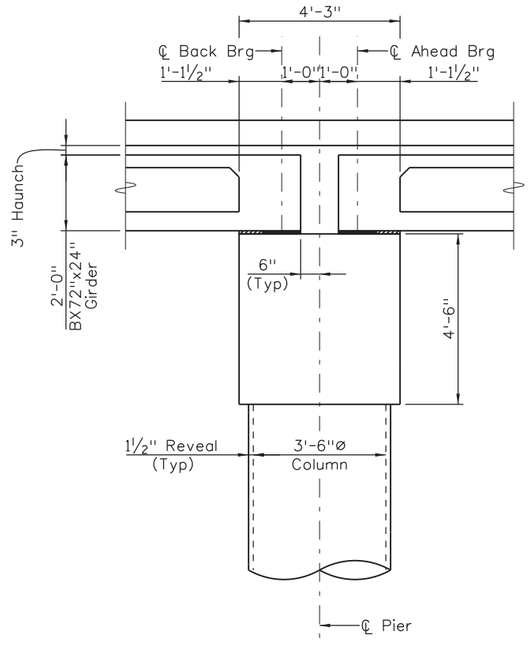

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Unit Information
Unit Leader

Front Range Mobility Group

Sheet Revisions		
Date:	Comments	Init.

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Revised:
Void:

ATTACHMENT A CENTRAL 70
I-70 OVER BRIGHTON BLVD BRIDGE
PIER DETAILS

Designer:
Detailer:
Sheet Subset:
Structure Numbers: E-17-AEU, E-17-AEV
Subset Sheets: 4 of 6

ATC 36
Project No./Code
Sheet Number

ATC SUBMITTAL

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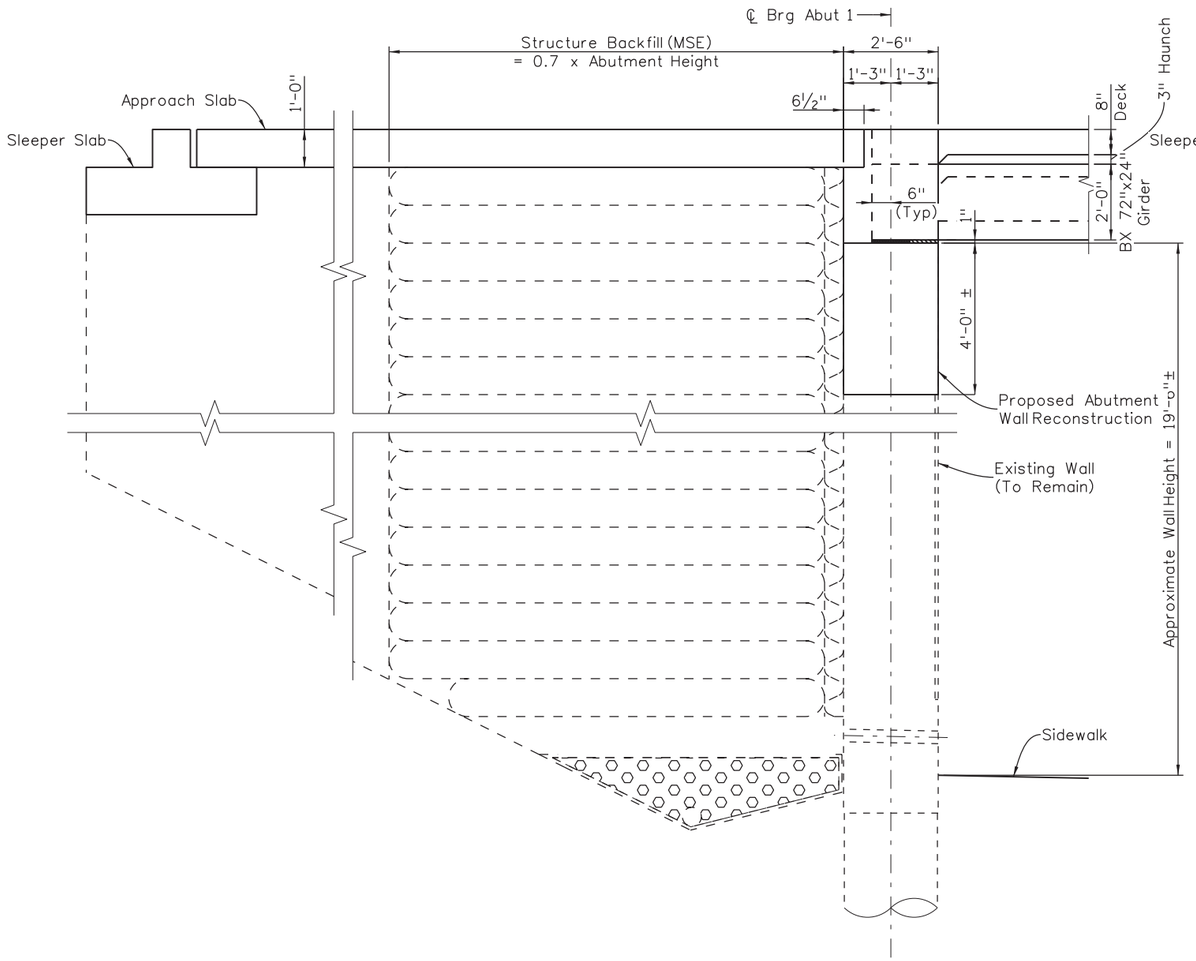

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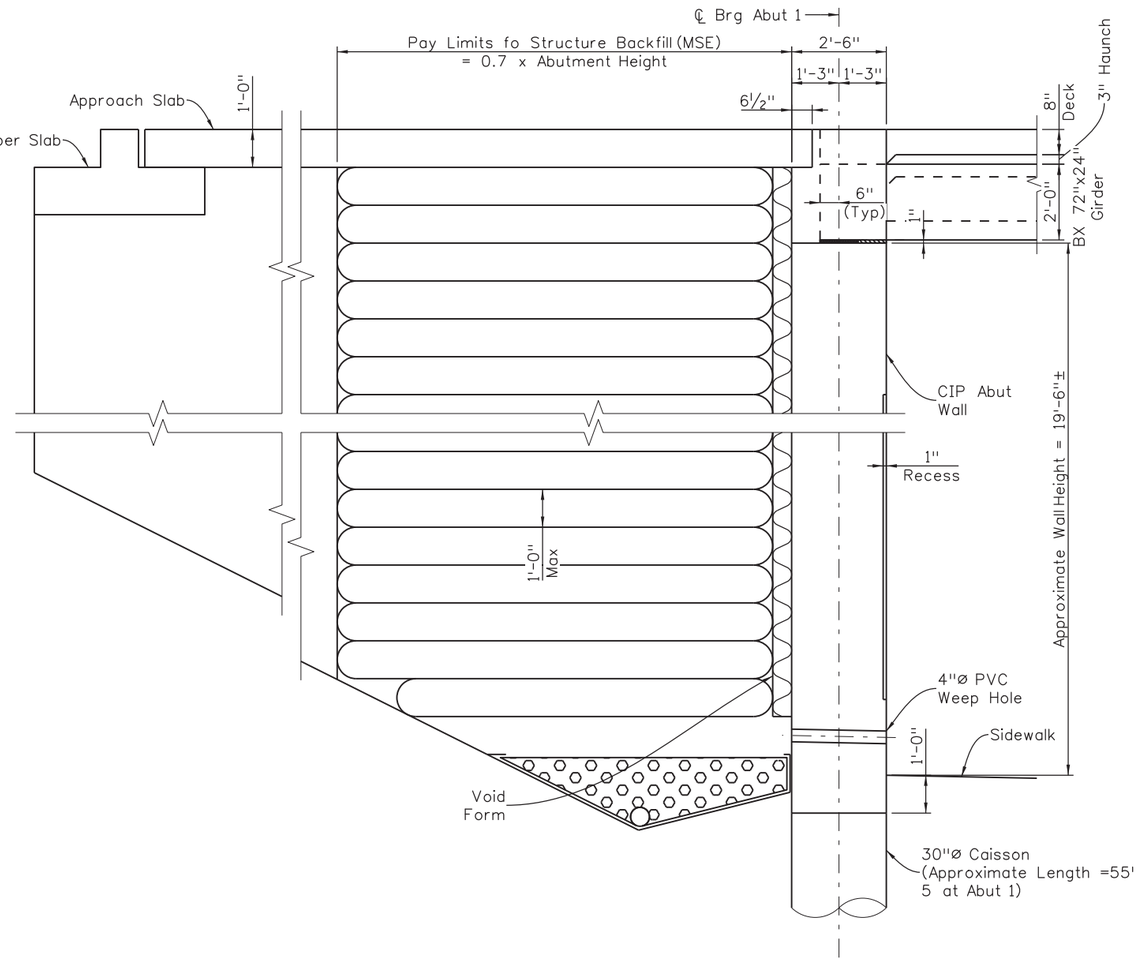

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Unit Information
Unit Leader

Front Range Mobility Group

Sheet Revisions		
Date:	Comments	Init.

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Region 1 KJS

As Constructed
No Revisions:
Revised:
Void:

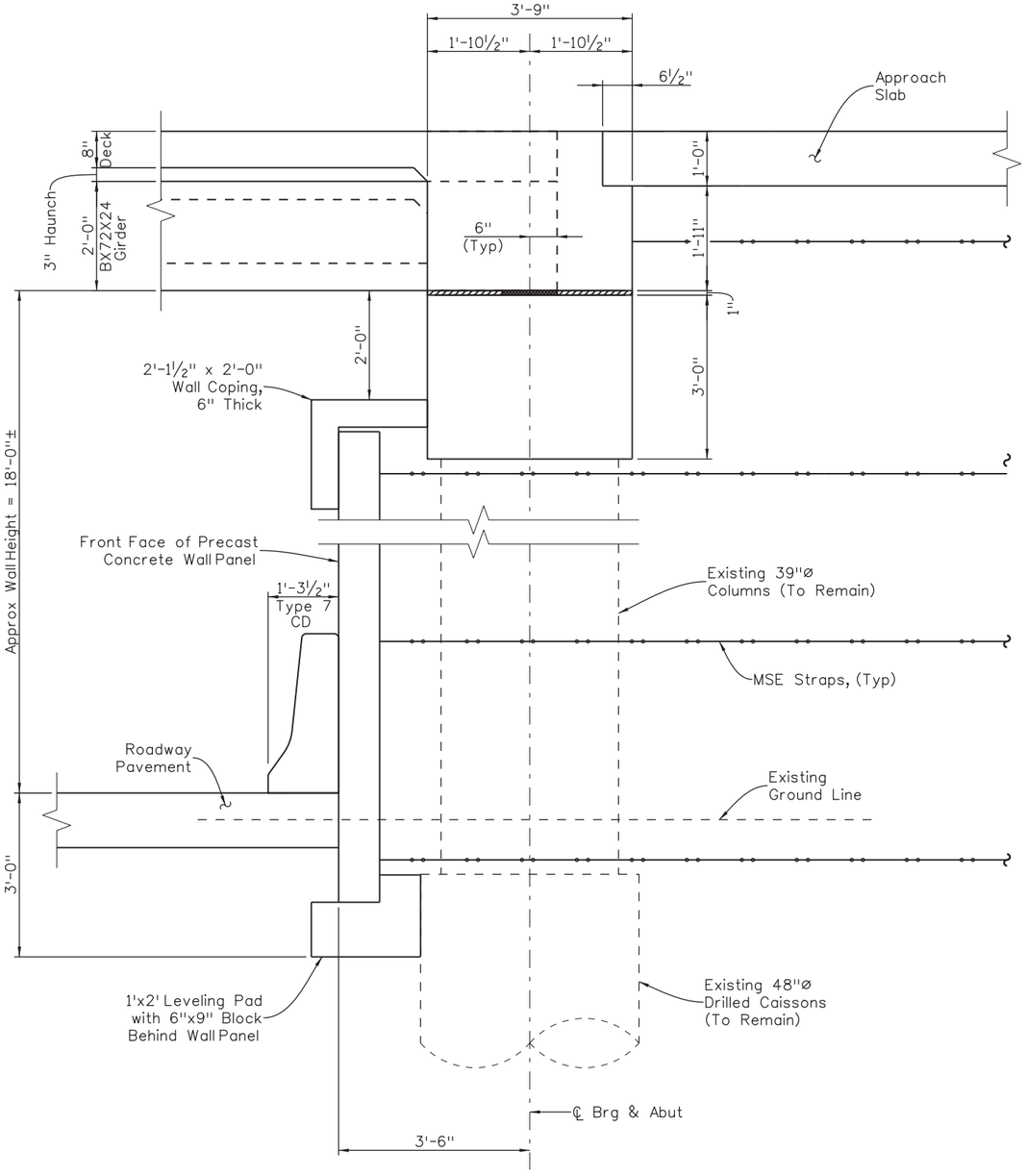
ATTACHMENT A CENTRAL 70
I-70 OVER BRIGHTON BLVD BRIDGE
ABUTMENT 1 DETAILS

Designer:
Detailer:
Sheet Subset:
Structure Numbers E-17-AEU E-17-AEV
Subset Sheets: 5 of 6

ATC 36
Project No./Code
Sheet Number

ATC SUBMITTAL

CONFIDENTIAL



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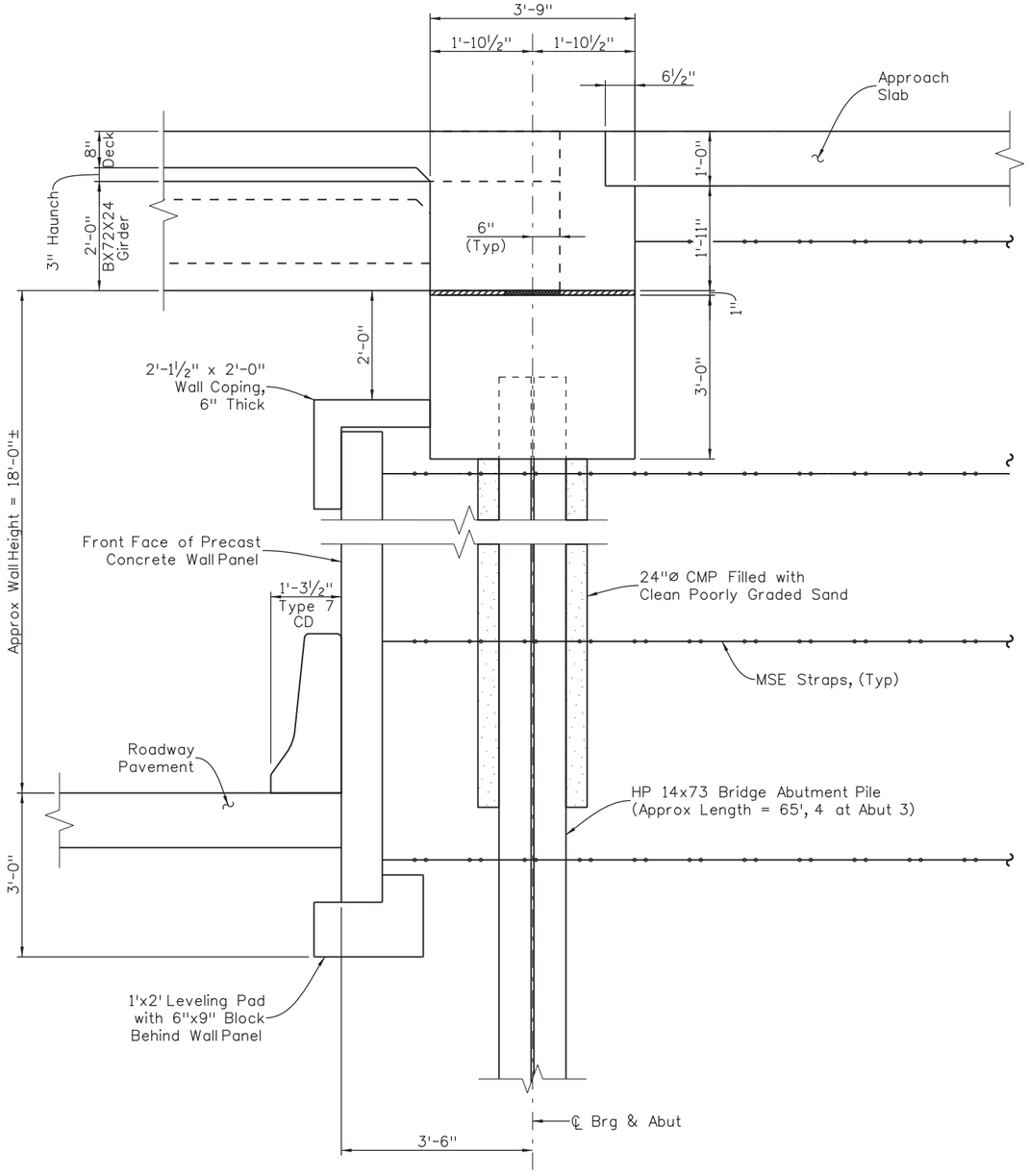

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Unit Leader

Front Range Mobility Group

Sheet Revisions		
Date:	Comments	Init.

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Region 1 KJS

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No Revisions:
Revised:
Void:

ATTACHMENT A CENTRAL 70
I-70 OVER BRIGHTON BLVD BRIDGE
ABUTMENT 3 DETAILS

Designer:
Detailer:
Sheet Subset:
Structure Numbers: E-17-AEU, E-17-AEV
Subset Sheets: 6 of 6

ATC 36
Project No./Code
Sheet Number

ATC SUBMITTAL

CONFIDENTIAL

Central 70

DATE: August 31, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 36.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 36.0 was reviewed by the Procuring Authorities prior to the August One-on-One Meetings and an initial response was sent to you on August 4, 2016. As discussed during the August One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Conceptual ATC. The ATC proposes to reuse a portion of the existing west abutments and pier number 2 of the existing structures for the proposed I-70 bridges over Brighton Blvd.

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.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Conceptual ATC Submission. The Procuring Authorities ask that the following items are addressed in the Detailed ATC submission:

1. Provide plan sheets and graphic for the proposed layout.
2. The final plans shall include design criteria meeting all current design requirements for reuse of any portion of the existing bridges.

The Procuring Authorities continue to reserve the right to modify the above evaluation and/or discuss the Conceptual ATC with FHWA and the City of Denver.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: July 13, 2016

Central 70 Project RFP: ATC Submission No. 36.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

This ATC proposed to permit the reuse of a portion of the existing west abutments and piers no, 2 of existing structures E-17-UY and E-17-US for the proposed I-70 bridges over Brighton Boulevard; proposed bridges E-17-AEU and E-17-AEV.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

- Schedule 10, Section 13.5.2 Table 13-2 Action for bridges structures

This table indicates removal of the existing bridges (E-17-UY and E-17-US) and complete reconstruction with the new bridges (E-17-AEU and E-17-AEV)

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

The existing bridge span carrying I-70 over Brighton Boulevard was constructed in 2000. This span and substructure units were designed for MS22 live load, the metric equivalent of HS25 live load using the load factor design method per the former AASHTO Bridge Standard Design Specifications. HS25 live load slightly exceeds the HL93 live load specified in the current AASHTO LRFD bridge design specifications.

Furthermore, the proposed configuration of the proposed new structures will be a two span configuration with a center pier; dividing the existing one span bridge into two shorter spans to achieve a shallower superstructure depth. The inclusion of this additional pier will significantly lower the dead and live load reactions on the existing west abutment and existing pier number 2 on the east side of Brighton Boulevard.

Given the above, the existing substructure units and foundations will receive significantly reduced loads then they are currently supporting for the current configuration. There is high confidence and little doubt they will be more than adequate to remain in place and support the lesser future loads of the proposed new 2 span replacement superstructure. This ATC proposed to re-use portions of the existing abutments and pier and widen and reconfigure them as necessary to accommodate the proposed new 2-span superstructure. This will result in lower construction costs for the removal of the old structure and construction of the proposed new structure.

This ATC is consistent with accepted best practice to re-use and revise, rehabilitate and incorporate existing bridge elements into new work to achieve effective use of the existing structure as well as better economy and lower cost for the proposed project improvement.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

There are no social or operation impacts.

Durability and long term maintenance requirements are not impacted. The existing substructure elements

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

proposed for re-use are less than 20 years old and in good condition. Any minor deficiencies will be repaired and restored to like new condition during widening of the substructure units and reconstruction of the superstructure.

Community impacts and traffic congestion during construction are potentially reduced due to a shorter construction duration attributed to less time needed for existing substructure removal and proposed structure replacement.

Environmentally, this ATC achieves a reduction in impacts by re-using and incorporating existing elements of the current facility into the new project lowering demand for new replacement materials.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

A reduction in construction cost for proposed new structures E-17-AEU and E-17-AEV will be realized by not having to completely remove the existing substructure units and completely reconstruct them for the new bridges.

We anticipate a substantial CapEx and O&M savings under $2.5M as a result of the approval of this ATC.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

This ATC proposal improves and shortens the constructions schedule by needing less time for existing bridge removal and subsequent replacement bridge reconstruction. FRMG is estimating about one month in construction time saving.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

Not Applicable

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

It is common practice to widen and re-use portions of or entire existing bridges in situation such as this where the existing structure is in good condition.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

Not applicable.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

Not applicable

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

Not applicable

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

Not applicable

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

Not applicable

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

Not applicable

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC 43

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 43

Central 70

DATE: March 3, 2017

TO: Front Range Mobility Group

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
Front Range Mobility Group - ATC No. 43.2

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 43.2 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 43.2 proposes to revise the minimum spacing of temporary emergency pullouts to allow for spacing greater than 0.5 miles.

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 February 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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: January 20, 2017

Central 70 Project RFP: ATC Submission No. 43.2[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☐ Previously Submitted as Conceptual ATC

☒ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

The Procuring Authorities ask that the following items are addressed in the Detailed ATC submission:

1. Emergency pullouts shall have the full emergency pullout dimensions. 8-foot shoulders shall not be used to substitute for emergency pullouts.

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

During construction, this ATC is proposing to use a combination of temporary emergency pullouts per Schedule 10 Section 2 and 8-ft and wider shoulders along I-70, to provide locations for disabled vehicles and staging of incident management. This ATC also proposes revising the minimum spacing of temporary emergency pullouts and 8-ft and wider shoulders to allow for spacing slightly greater than 0.5 miles. This proposal applies to the construction work zone along I-70 from east of Colorado Blvd. to Chambers Rd.

There are varying guidelines on emergency pullout spacing within work zone areas.

The "*Virginia Work Area Protection Manual, Standards and Guidelines for Temporary Traffic Control*" provides the following guidance: "*The spacing of pull-off areas should be as follows: For projects with activity areas greater than 1.0 mile but less than 2.0 miles in length, one every 0.5 to 0.75 mile. For projects with activity areas greater than 2.0 miles in length, one every mile.*"

The Maryland DOT provides the following guidance in their *Traffic Engineering and Safety Manual*, Application Guideline No. 6-G2: "*For work areas greater than 1 mile in length, multiple pull-off areas may be used at spacing of ½ mile acceptable, 1 mile desirable and 2 miles maximum.*"

This ATC is asking to modify RFP requirements of Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 – Emergency Pullouts in combination with spacing greater than 0.5 miles for temporary emergency pull out and wide shoulders, and the use of exit ramp areas for emergency pullouts and wide shoulders.

Temporary emergency pullouts have added to replace sections of 8-ft shoulders that were along exit ramps and are shown in Attachment A.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3]*.*

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

This ATC is inconsistent with Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 asking to increase the 0.5 mile spacing of temporary emergency pullouts between Colorado Blvd. and Chambers Rd.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

This ATC will be used as an alternative to the emergency pullout locations noted in Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20.

FRMG is asking to use this ATC because it provides the use of emergency pullouts within one mile along the corridor at the identified locations in Attachment A. This will minimize the number of lane tapers and traffic shifts for the traveling public and provide a consistent travel way for motorists. This will allow for larger work zones to provide enhanced construction quality by avoiding construction in small areas and

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

shifting traffic multiple times to provide construction access.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

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

This ATC has a positive impact on safety through the work zone by providing emergency pullouts within one mile spacing of each other. .

This ATC has a positive impact on the environment because it reduces the amount of material needed for temporary emergency pullouts.

There are no identified negative environmental, social, economic, community, operations and maintenance or third party impacts.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

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

We anticipate a substantial CapEx and O&M savings of $1.5M. The saving is associated with reduction of temporary pavement, excavation and embankment, along with larger work zones allowing for more construction efficiency.

- Temporary Pavement Reduction: $ 200,000
- Embankment Reduction: $ 150,000
- Earthwork Improved Productivity Efficiency: $ 250,000
- Roadway Improved Productivity Efficiency: $ 250,000
- Walls Construction Improved Productivity Efficiency: $ 150,000
- MOT Simplified Scheme: $ 250,000
- Project Schedule Benefits: $ 250,000

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

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

Incorporation of this ATC will result in a saving of about two months of construction schedule associated with larger work zones and reduction of material necessary to build the Project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

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

Refer to Attachment A to this document for additional information regarding the ATC request. Additional pullouts have been added to the previous submission to eliminate short lengths of 8-ft shoulders along the exit ramps.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

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

The Maryland DOT and Virginia DOT provide guidance allowing for emergency pullout spacing greater than 0.5 miles. The project specifications regarding the dimensions of the pullouts would be maintained.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

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

Refer to Attachment A to this document that address Procuring Authority request of providing site specific graphics and details for the layout of the emergency pullouts.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement

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

There are no identified risks associated with the increased spacing for temporary emergency pull outs. Other state DOTs, as described in section B.1, allow for spacing greater than 0.5 miles.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

"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 Handback Requirements associated with the approval of this ATC.

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any

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

No requirement for additional Right-of-Way is anticipated relative to implementation of this ATC.

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

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

No additional third party and Governmental Approvals are anticipated relative to implementation of this ATC.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

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

This ATC is inconsistent with Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20. The design criteria requires temporary emergency pull outs or 8-ft wide shoulders to be spaced a maximum of 0.5 miles along I-70. FRMG is asking to increase the 0.5 mile minimum spacing for emergency pullouts and 8-ft or wider shoulders.

Upon approval of this ATC, Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 would be modified as shown below, noting the increased spacing and allowable locations for temporary emergency pull outs.

> *2.11.20 Emergency Pullouts*
>
> *For facilities under construction, the Developer shall provide Emergency pullouts on the I-70 Mainline for disabled vehicles, staging of incident management, and law enforcement vehicles, when shoulder widths are less than eight feet. Emergency pullouts shall be provided at the outside shoulder, between each interchange or at ~~0.5~~ 1.0 mile spacing, whichever is less. For determining ~~0.5~~ 1.0 mile spacing, the emergency pullouts shall be measured from the center of*

the first pullout to the center of the next pullout. Interchange distance shall be measured from ramp gore to ramp gore in the same direction of travel. The minimum pullout length shall be 150 feet, not including transitions. Pullouts shall be placed on the outside shoulder only.

Attachment A

Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 43.2

CONCEPTUAL DRAWINGS

AREA 2

PHASE 1 STAGE 2
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA

ATC SUBMITTAL

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	Vert. Scale:						Detailer:	
	Unit Information				Region 1 KJS	Void:	Sheet Subset:	Subset Sheets: 1 of 8
	Unit Leader							Sheet Number

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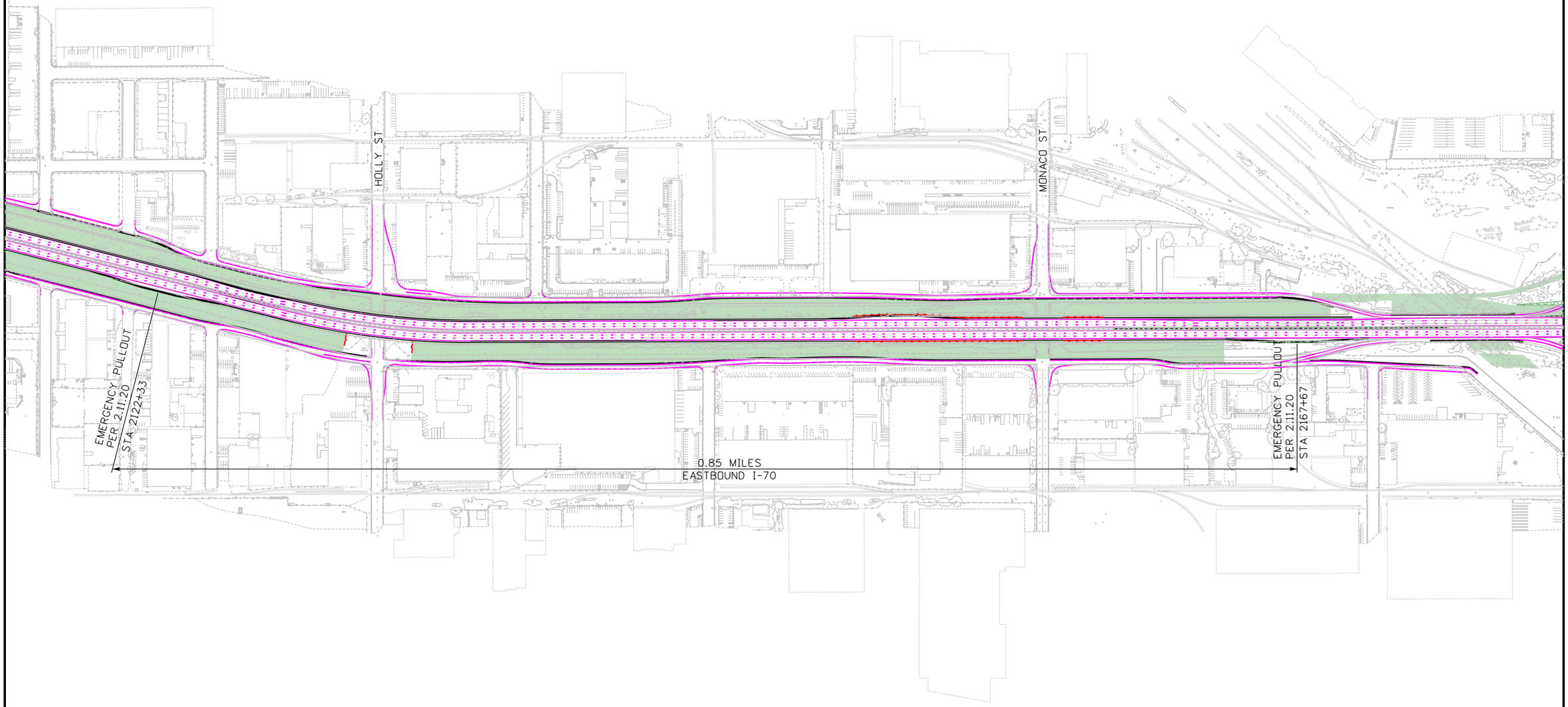
CONFIDENTIAL

AREA 2
PHASE 1 STAGE 2
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



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	Vert. Scale:				Region 1 KJS	Void:
	Unit Information					
	Unit Leader					

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			Project No./Code
Designer:	Structure Numbers		
Detailer:			
Sheet Subset:	Subset Sheets: 2 of 8		Sheet Number

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ATC SUBMITTAL

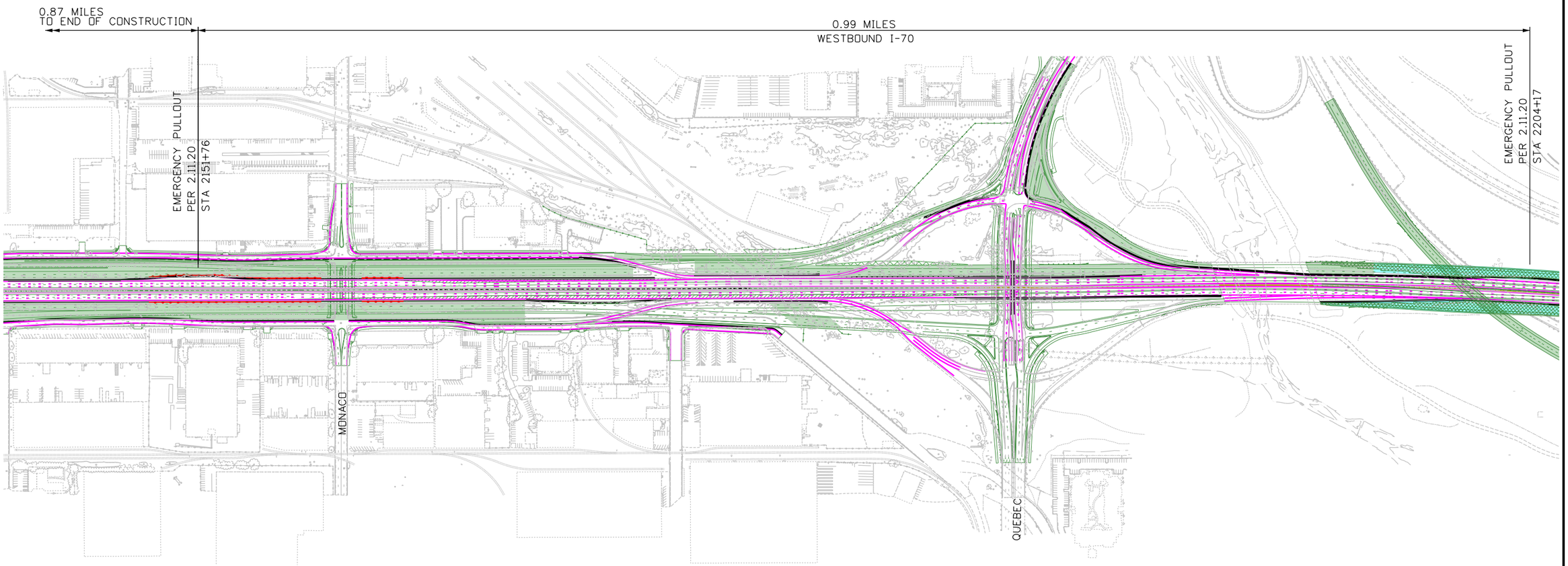
CONFIDENTIAL

LEGEND

CONSTRUCTION AREA

AREA 2

PHASE 1 STAGE 2
WESTBOUND I-70



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Unit Information
Unit Leader

Front Range Mobility Group

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Sheet Revisions		
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Colorado Department of Transportation
2000 South Holly Street
Denver, CO 80222
Phone: 303-757-9934 FAX: 303-757-9907
Region 1 KJS

As Constructed
No Revisions:
Revised:
Void:

ATTACHMENT A
TEMPORARY EMERGENCY PULLOUT/
WIDE SHOULDER LOCATIONS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 3 of 8

ATC-43
Project No./Code
Sheet Number

ATC SUBMITTAL

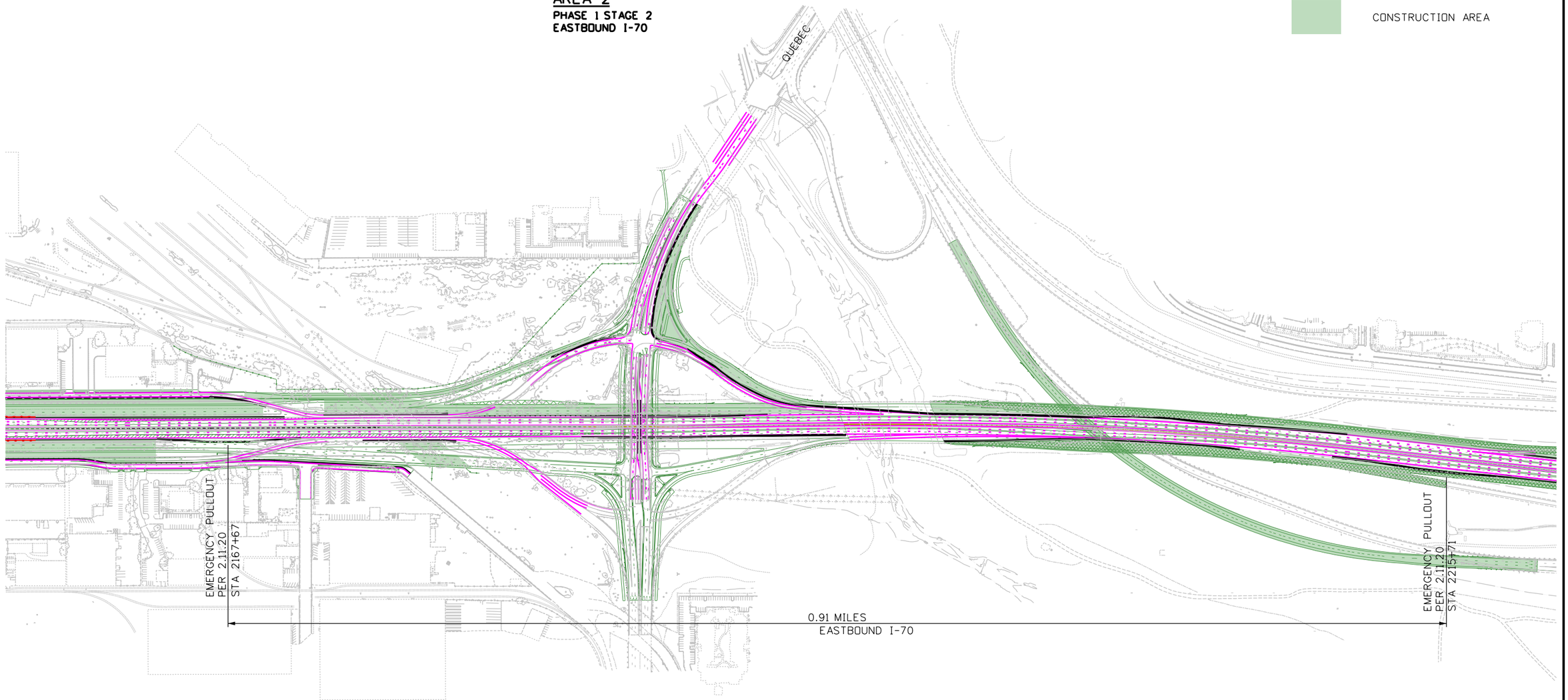
CONFIDENTIAL

AREA 2

PHASE 1 STAGE 2
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



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	Unit Information				
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Colorado Department of Transportation
2000 South Holly Street
Denver, CO 80222
Phone: 303-757-9934 FAX: 303-757-9907
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ATTACHMENT A
TEMPORARY EMERGENCY PULLOUT/
WIDE SHOULDER LOCATIONS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 4 of 8

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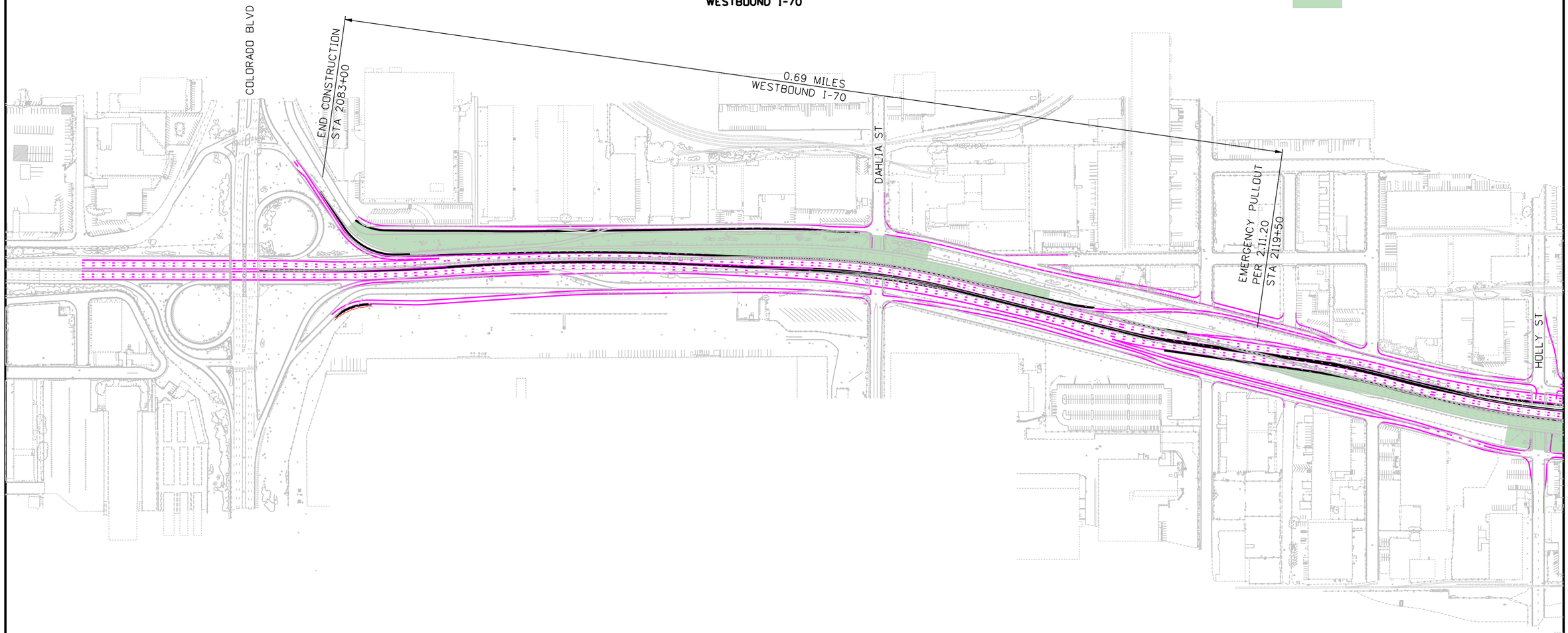
AREA 2
PHASE 1 STAGE 3
WESTBOUND I-70

LEGEND

CONSTRUCTION AREA



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	Vert. Scale:				Region 1 KJS	Void:
	Unit Information					
	Unit Leader					

ATTACHMENT A TEMPORARY EMERGENCY PULLOUT/ WIDE SHOULDER LOCATIONS			ATC-43
Designer:	Structure Numbers		Project No./Code
Detailer:			
Sheet Subset:	Subset Sheets: 5 of 8		Sheet Number

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ATC SUBMITTAL

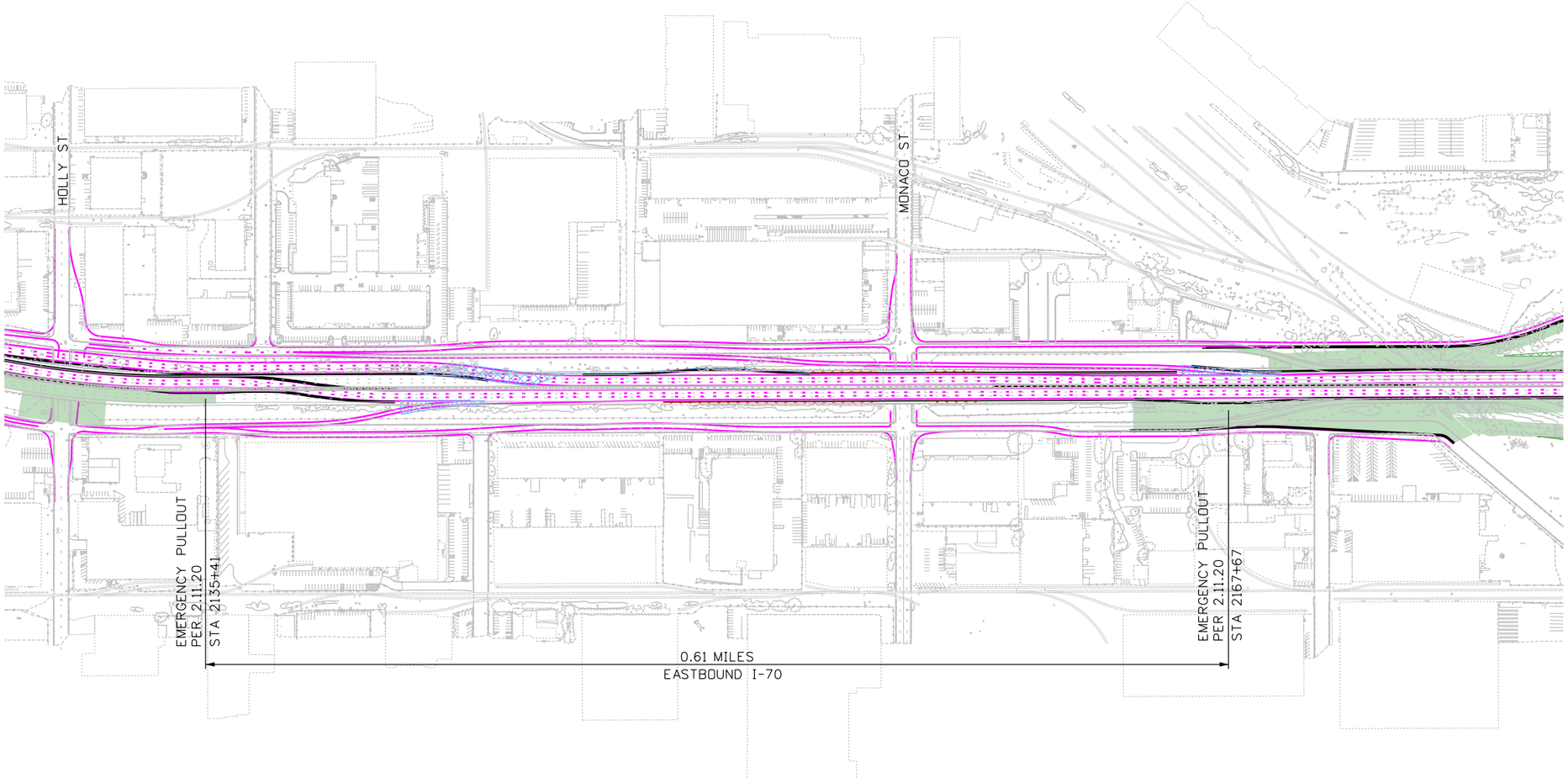
CONFIDENTIAL

LEGEND

CONSTRUCTION AREA

AREA 2

PHASE 1 STAGE 3
EASTBOUND I-70



ATC SUBMITTAL

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Horiz. Scale: $SCALESHORT$					Region 1 KJS
Vert. Scale:					
Unit Information					
Unit Leader					

Front Range Mobility Group

$PLOT_INFO$

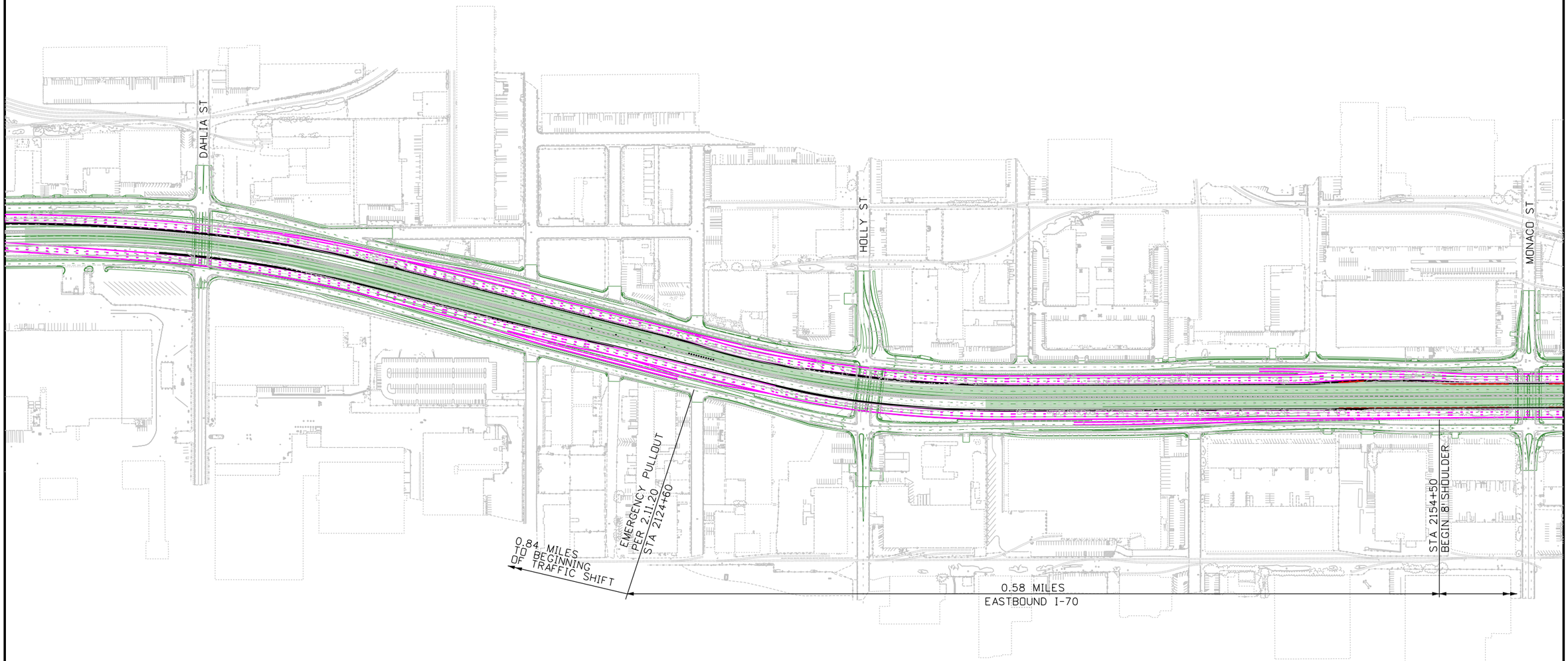
As Constructed	ATTACHMENT A TEMPORARY EMERGENCY PULLOUT/ WIDE SHOULDER LOCATIONS			ATC-43
No Revisions:				Project No./Code
Revised:	Designer:	Structure Numbers		
Void:	Detailer:			
	Sheet Subset:	Subset Sheets: 6 of 8		Sheet Number

CONFIDENTIAL

AREA 2
PHASE 2 STAGE 1
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



ATC SUBMITTAL

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Front Range Mobility Group	Horiz. Scale: $SCALESHORT$	0000					Revised:	Designer:	Structure Numbers	
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	Unit Information					Region 1 KJS	Void:	Sheet Subset:	Subset Sheets: 7 of 8	Sheet Number
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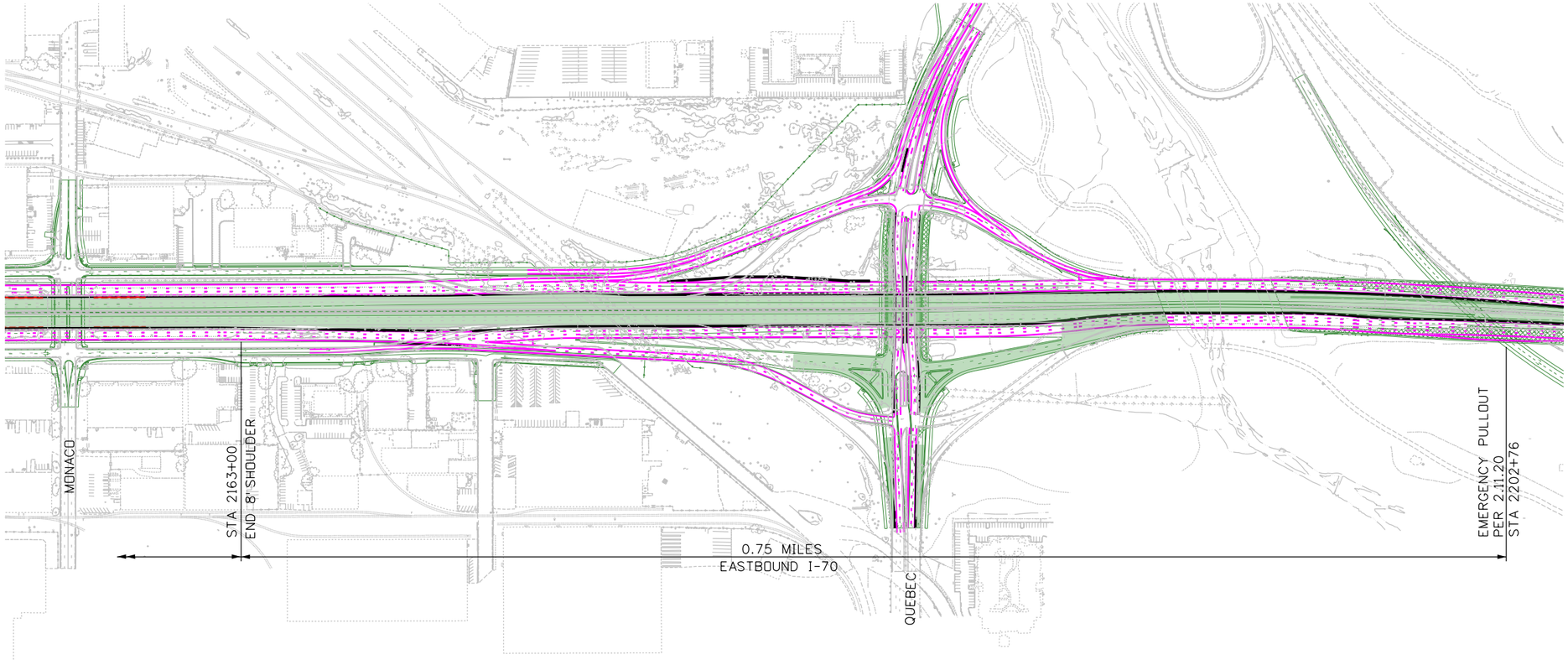
CONFIDENTIAL

LEGEND

CONSTRUCTION AREA

AREA 2
PHASE 2 STAGE 1
EASTBOUND I-70



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Unit Information
Unit Leader

Front Range Mobility Group

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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

As Constructed
No Revisions:
Revised:
Void:

ATTACHMENT A
TEMPORARY EMERGENCY PULLOUT/
WIDE SHOULDER LOCATIONS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 8 of 8

ATC-43
Project No./Code
Sheet Number

ATC SUBMITTAL

$PLOT_INFO$

CONFIDENTIAL

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 43.1

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 43.1 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 43.1 proposes to use exit ramps along I-70 as emergency pullouts at spacing greater than 0.5 miles.

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 December 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. The Procuring Authorities would like the following items addressed in the Detailed ATC re-submission:

1. Emergency pullouts shall have the full emergency pullout dimensions as required by Schedule 10, Section 2. 8 foot shoulders shall not be used to substitute for emergency pullouts.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 8, 2016

Central 70 Project RFP: ATC Submission No. 43.1[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☒ Previously Submitted as Conceptual ATC

☐ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

The Procuring Authorities ask that the following items are addressed in the Detailed ATC submission:

1. Provide site specific graphics and details for the layout of the emergency pullouts.

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

During construction, this ATC is proposing to use a combination of temporary emergency pullouts per Schedule 10 Section 2 and 8-ft and wider shoulders along I-70 and exit ramps, to provide locations for disabled vehicles and staging of incident management. This ATC also proposes revising the minimum spacing of temporary emergency pullouts and 8-ft and wider shoulders to allow for spacing slightly greater than 0.5 miles. This proposal applies to the construction work zone along I-70 from east of Colorado Blvd. to Chambers Rd.

There are varying guidelines on emergency pullout spacing within work zone areas.

The "*Virginia Work Area Protection Manual, Standards and Guidelines for Temporary Traffic Control*" provides the following guidance: "*The spacing of pull-off areas should be as follows: For projects with activity areas greater than 1.0 mile but less than 2.0 miles in length, one every 0.5 to 0.75 mile. For projects with activity areas greater than 2.0 miles in length, one every mile.*"

The Maryland DOT provides the following guidance in their *Traffic Engineering and Safety Manual*, Application Guideline No. 6-G2: "*For work areas greater than 1 mile in length, multiple pull-off areas may be used at spacing of ½ mile acceptable, 1 mile desirable and 2 miles maximum.*"

This ATC is asking to modify RFP requirements of Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 – Emergency Pullouts in combination with spacing greater than 0.5 miles for temporary emergency pull out and wide shoulders, and the use of exit ramp areas for emergency pullouts and wide shoulders.

The locations of temporary emergency pullouts and 8-ft or wider shoulders are shown in Attachment A.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3]*.*

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

This ATC is inconsistent with Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 asking to locate temporary emergency pullouts and 8-ft or wider shoulders along exit ramps, and increasing the 0.5 mile minimum spacing for emergency pullouts and 8-ft or wider shoulders between Colorado Blvd. and Chambers Rd.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

This ATC will be used as an alternative to the emergency pullout locations noted in Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20.

FRMG is asking to use this ATC because it provides the use of 8-ft shoulders and emergency pullouts

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

within one mile along the corridor at the identified locations in Attachment A. This will minimize the number of lane tapers and traffic shifts for the traveling public and provide a consistent travel way for motorists. This will allow for larger work zones to provide enhanced construction quality by avoiding construction in small areas and shifting traffic multiple times to provide construction access.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

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

This ATC has a positive impact on safety through the work zone by providing emergency pullouts or 8-ft shoulders within one mile spacing of each other. Emergency pullouts or 8-ft shoulders on the exit ramps provide the safety benefit and positive impact to traffic flow by allowing disabled vehicles and incident management access off of mainline I-70 to minimize driver distraction.

This ATC has a positive impact on the environment because it reduces the amount of material needed for temporary emergency pullouts.

There are no identified negative environmental, social, economic, community, operations and maintenance or third party impacts.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

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

We anticipate a substantial CapEx and O&M savings of $1.5M. The saving is associated with reduction of temporary pavement, excavation and embankment, along with larger work zones allowing for more construction efficiency.

- Temporary Pavement Reduction: $ 200,000
- Embankment Reduction: $ 150,000
- Earthwork Improved Productivity Efficiency: $ 250,000
- Roadway Improved Productivity Efficiency: $ 250,000
- Walls Construction Improved Productivity Efficiency: $ 150,000
- MOT Simplified Scheme: $ 250,000
- Project Schedule Benefits: $ 250,000

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

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

Incorporation of this ATC will result in a saving of about two months of construction schedule associated with larger work zones and reduction of material necessary to build the Project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

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

Refer to Attachment A to this document for additional information regarding the ATC request.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

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

The Maryland DOT and Virginia DOT provide guidance allowing for emergency pullout spacing greater than 0.5 miles. The project specifications regarding the dimensions of the pullouts would be maintained.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

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

Refer to Attachment A to this document that address Procuring Authority request of providing site specific graphics and details for the layout of the emergency pullouts.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

There are no identified risks associated with the increased spacing and use of exit ramps for temporary emergency pull outs and 8-ft or wider shoulders. Other state DOTs, as described in section B.1, allow for spacing greater than 0.5 miles. Emergency pullouts or 8-ft shoulders on the exit ramps provide the safety benefit and positive impact to traffic flow by allowing disabled vehicles and incident management access off of mainline I-70 to minimize driver distraction.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

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

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

No requirement for additional Right-of-Way is anticipated relative to implementation of this ATC.

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

No additional third party and Governmental Approvals are anticipated relative to implementation of this ATC.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

This ATC is inconsistent with Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20. The design criteria requires temporary emergency pull outs or 8-ft wide shoulders to be spaced a maximum of 0.5 miles along I-70. FRMG is asking to locate temporary emergency pullouts and 8-ft or wider shoulders along exit ramps, and increasing the 0.5 mile minimum spacing for emergency pullouts and 8-ft or wider shoulders.

Upon approval of this ATC, Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 would be modified as shown below, noting the increased spacing and allowable locations for temporary emergency pull outs or 8-ft shoulders.

> *2.11.20 Emergency Pullouts*
>
> *For facilities under construction, the Developer shall provide Emergency pullouts on the I-70 Mainline or exit ramps for disabled vehicles, staging of incident management, and law enforcement vehicles, when shoulder widths are less than eight feet. Emergency pullouts shall*

be provided at the outside shoulder, between each interchange or at ~~0.5~~ 1.0 mile spacing, whichever is less. For determining ~~0.5~~ 1.0 mile spacing, the emergency pullouts shall be measured from the center of the first pullout to the center of the next pullout. Interchange distance shall be measured from ramp gore to ramp gore in the same direction of travel. The minimum pullout length shall be 150 feet, not including transitions. Pullouts shall be placed on the outside shoulder only.

Attachment A

Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 43.1

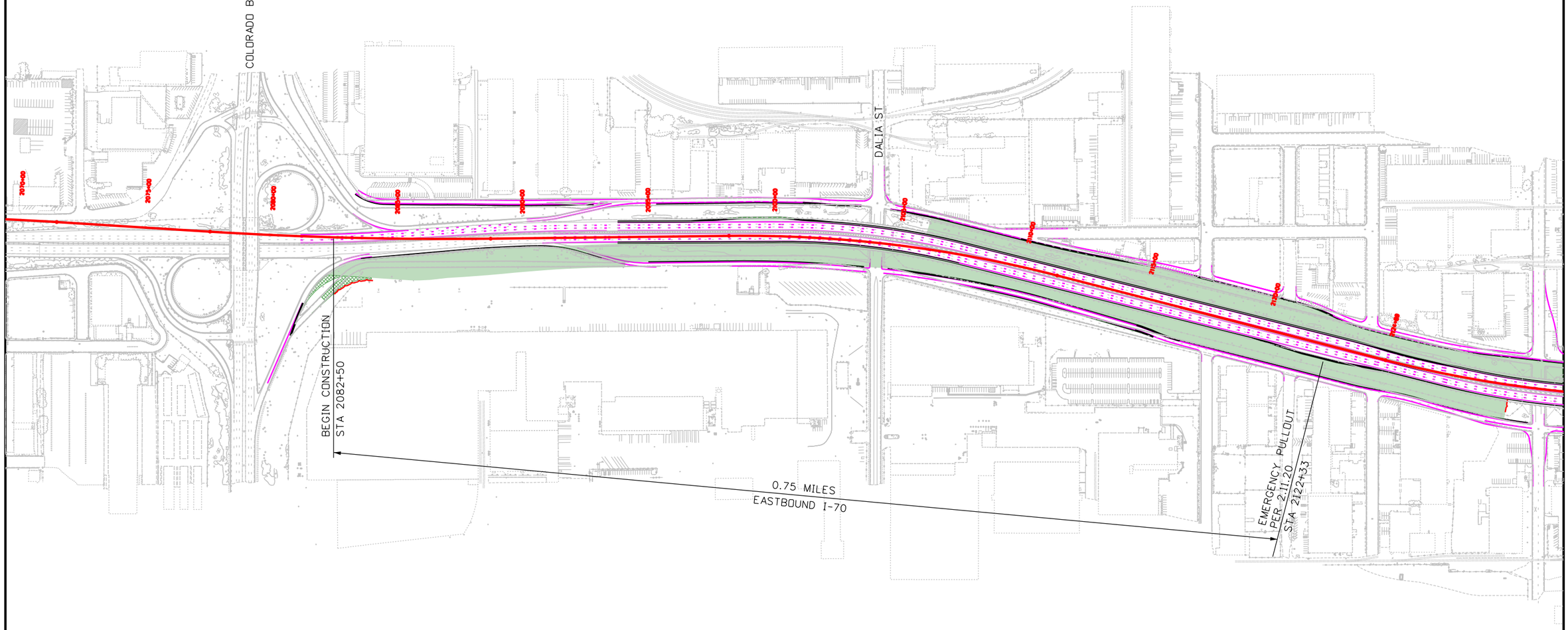
CONCEPTUAL DRAWINGS

AREA 2

PHASE 1 STAGE 2
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



ATC SUBMITTAL

ATC-43

Project No./Code

Sheet Number

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File Name: $FILES$
Horiz. Scale: $SCALESHORT$
Vert. Scale:
Unit Information
Unit Leader

Front Range Mobility Group

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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

As Constructed
No Revisions:
Revised:
Void:

ATTACHMENT A
TEMPORARY EMERGENCY PULLOUT/
WIDE SHOULDER LOCATIONS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 1 of 9

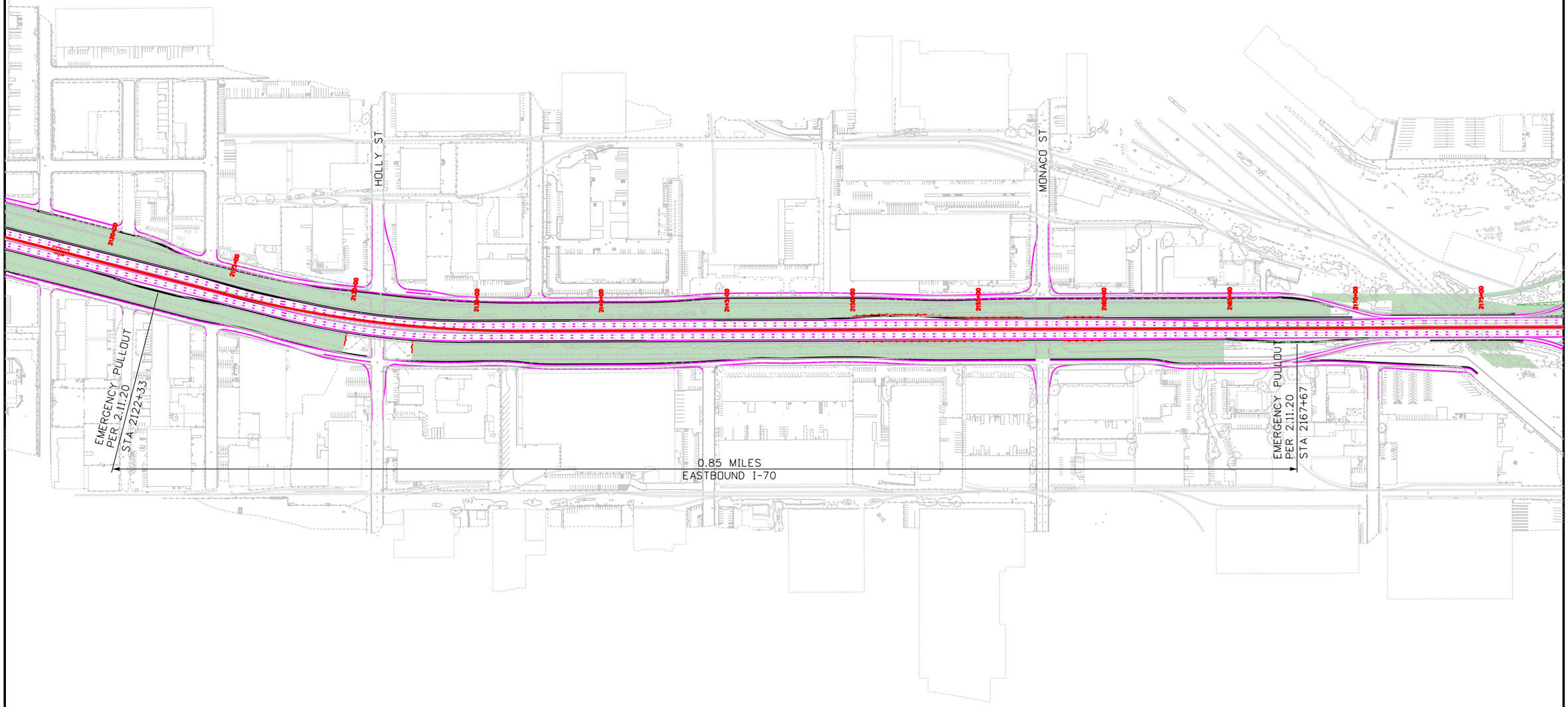
$PLOT_INFO$

CONFIDENTIAL

AREA 2
PHASE 1 STAGE 2
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



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	Unit Leader				Sheet Number

$PLOT_INFO$

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ATTACHMENT A
TEMPORARY EMERGENCY PULLOUT/
WIDE SHOULDER LOCATIONS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 2 of 9

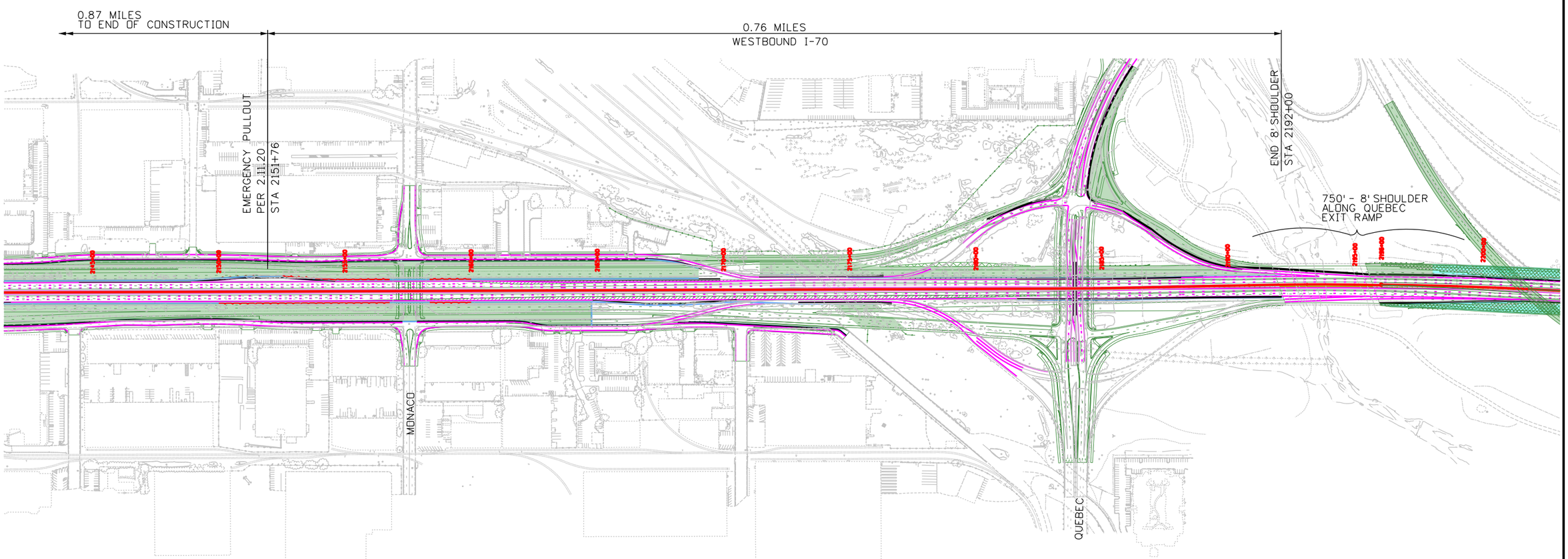
CONFIDENTIAL

AREA 2

PHASE 1 STAGE 2
WESTBOUND I-70

LEGEND

CONSTRUCTION AREA



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	Unit Leader									

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CONFIDENTIAL

ATC SUBMITTAL

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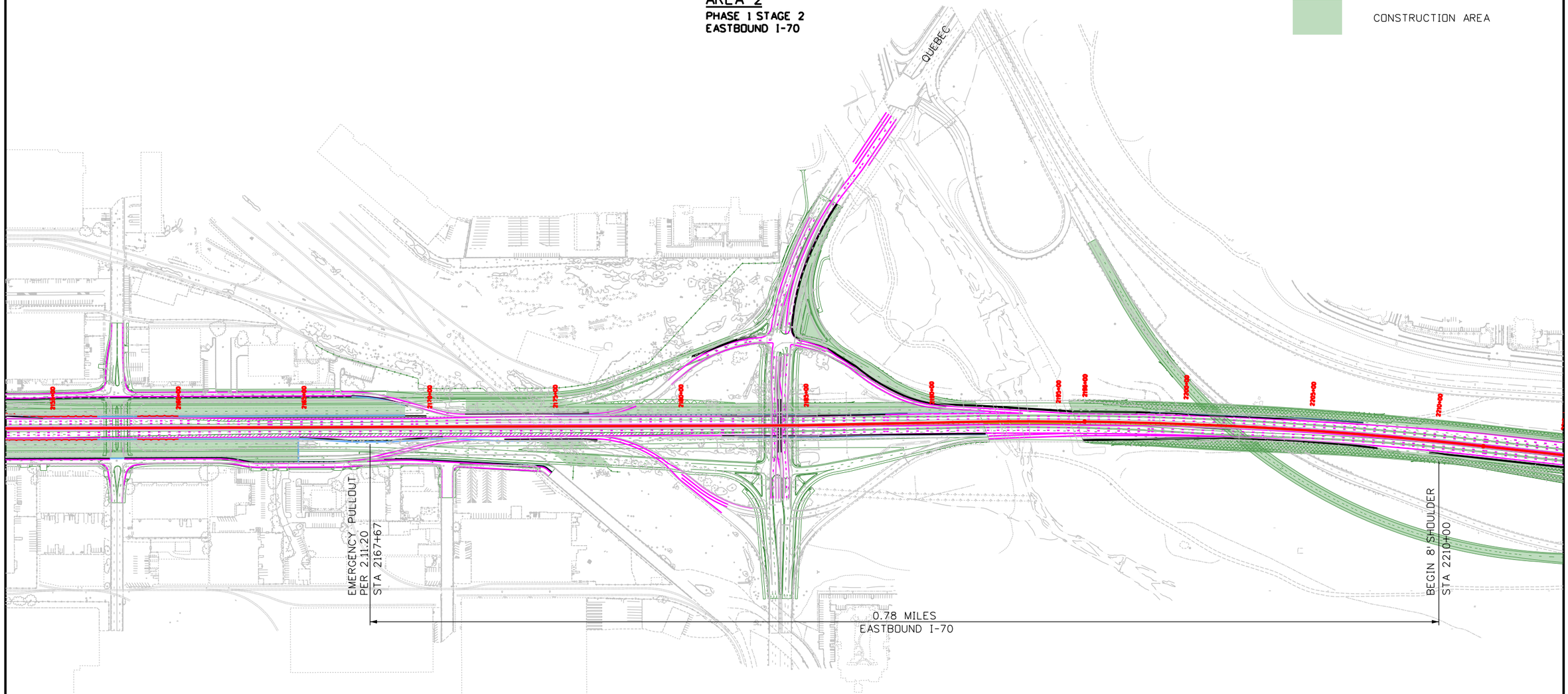
PHASE 1 STAGE 2
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



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ATC-43

Project No./Code

Sheet Number

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Unit Information
Unit Leader

Front Range Mobility Group

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Sheet Revisions		
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Colorado Department of Transportation
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KJS

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ATTACHMENT A
TEMPORARY EMERGENCY PULLOUT/
WIDE SHOULDER LOCATIONS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 4 of 9

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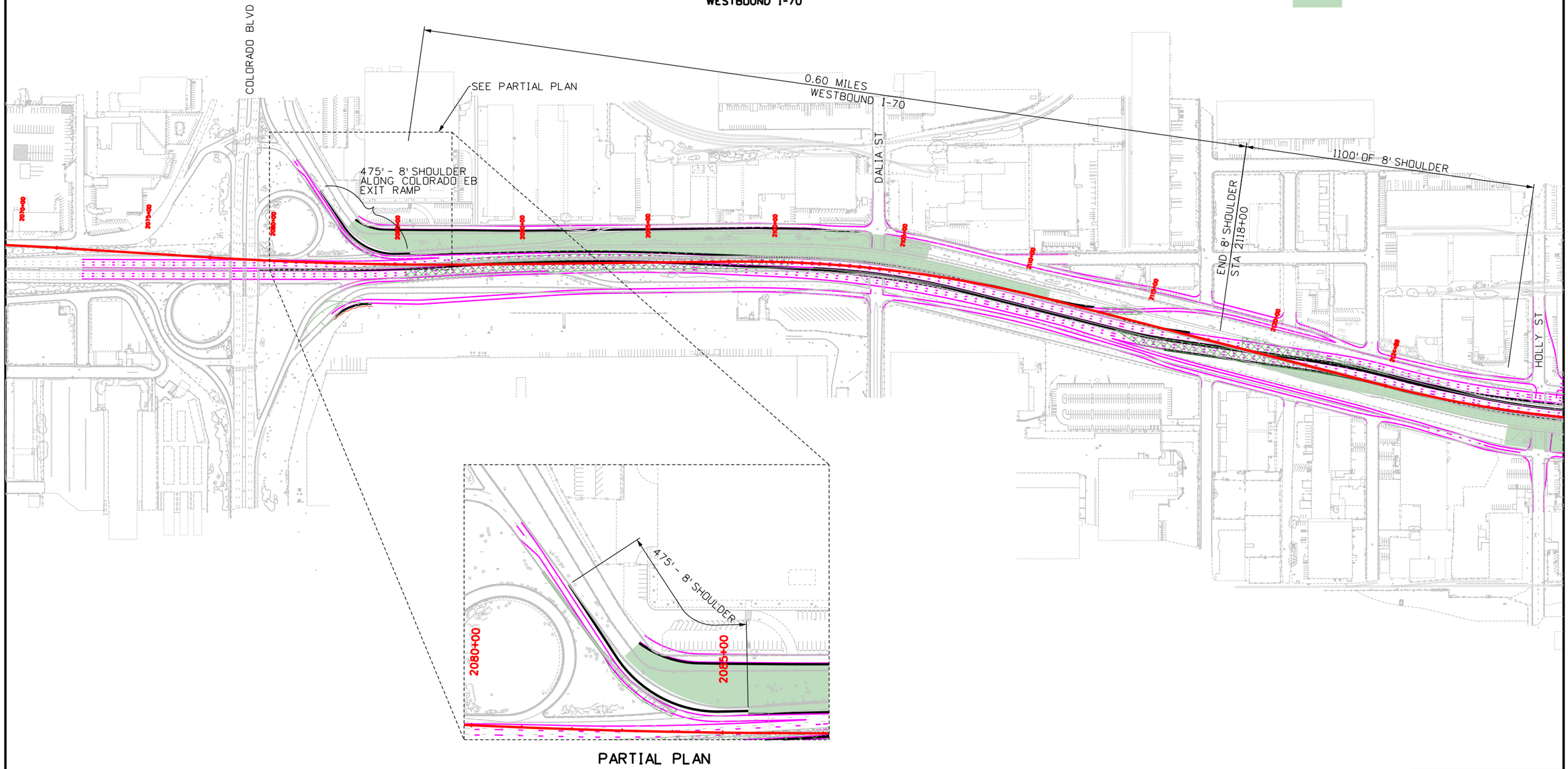
AREA 2

PHASE 1 STAGE 3
WESTBOUND I-70

LEGEND

CONSTRUCTION AREA



PARTIAL PLAN

ATC-43

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Unit Information					Region 1 KJS		Project No./Code
Unit Leader							Sheet Number

Front Range Mobility Group

$PLOT_INFO$

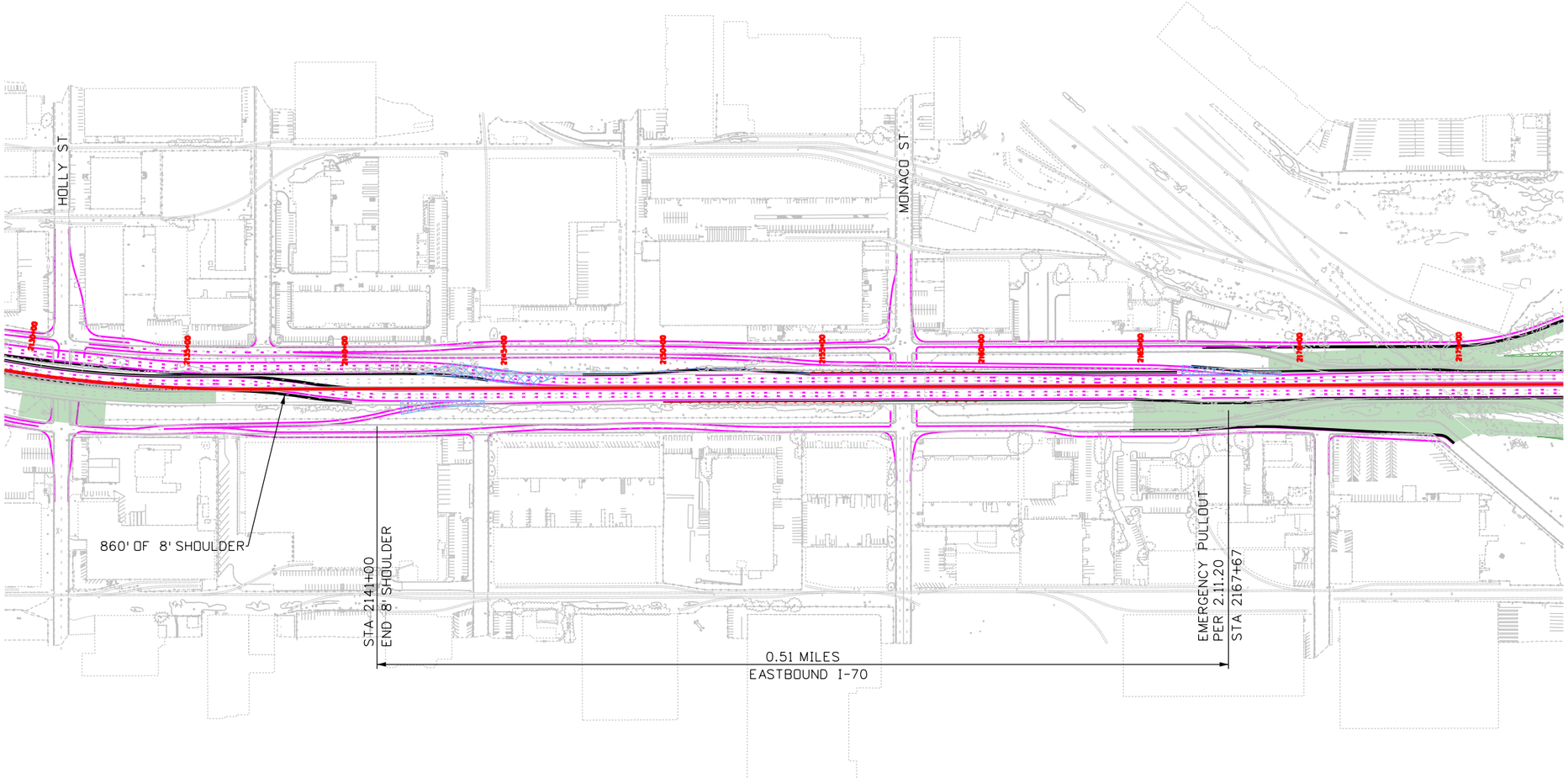
CONFIDENTIAL

ATC SUBMITTAL

AREA 2
PHASE 1 STAGE 3
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



ATC-43

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Vert. Scale:
Unit Information
Unit Leader

Front Range Mobility Group

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Colorado Department of Transportation
2000 South Holly Street
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Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 6 of 9

Project No./Code

Sheet Number

ATC SUBMITTAL

$PLOT_INFO$

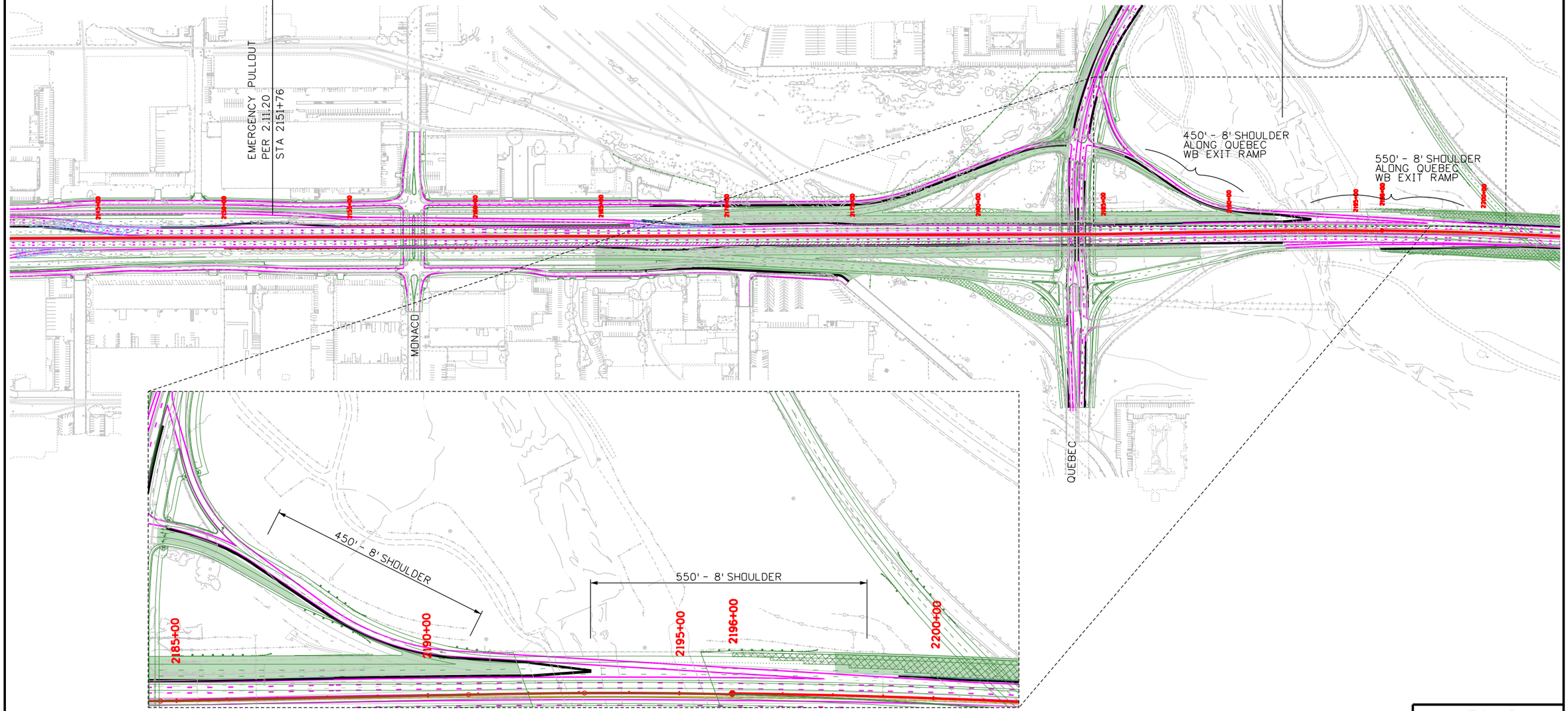
CONFIDENTIAL

AREA 2

PHASE 1 STAGE 3
WESTBOUND I-70

LEGEND

CONSTRUCTION AREA



PARTIAL PLAN

ATC-43

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Unit Information
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Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 7 of 9

Project No./Code

Sheet Number

ATC SUBMITTAL

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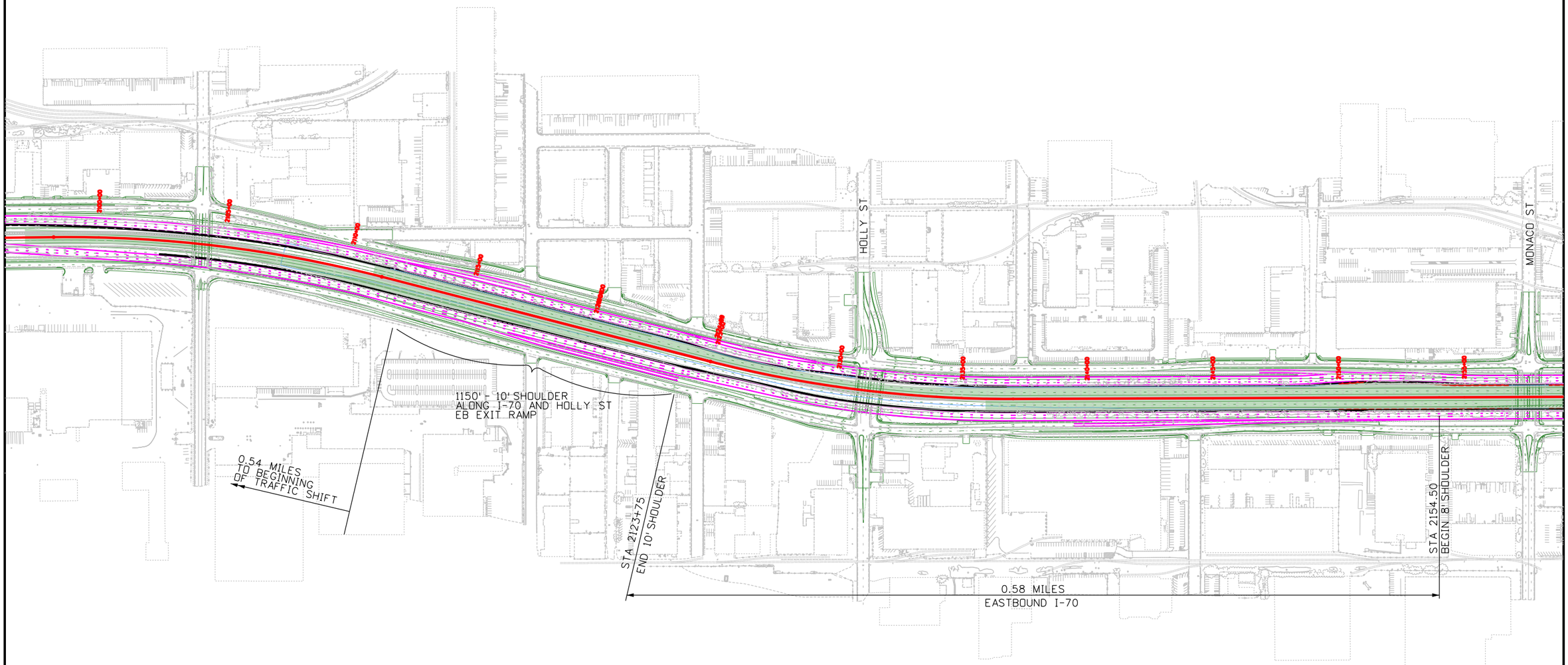
CONFIDENTIAL

AREA 2

PHASE 2 STAGE 1
EASTBOUND I-70

LEGEND

CONSTRUCTION AREA



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	Vert. Scale:				
	Unit Information				
	Unit Leader				

As Constructed	ATTACHMENT A TEMPORARY EMERGENCY PULLOUT/ WIDE SHOULDER LOCATIONS		Project No./Code
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Revised:	Detailer:		
Void:	Sheet Subset:	Subset Sheets: 8 of 9	Sheet Number

ATC SUBMITTAL

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LEGEND

CONSTRUCTION AREA

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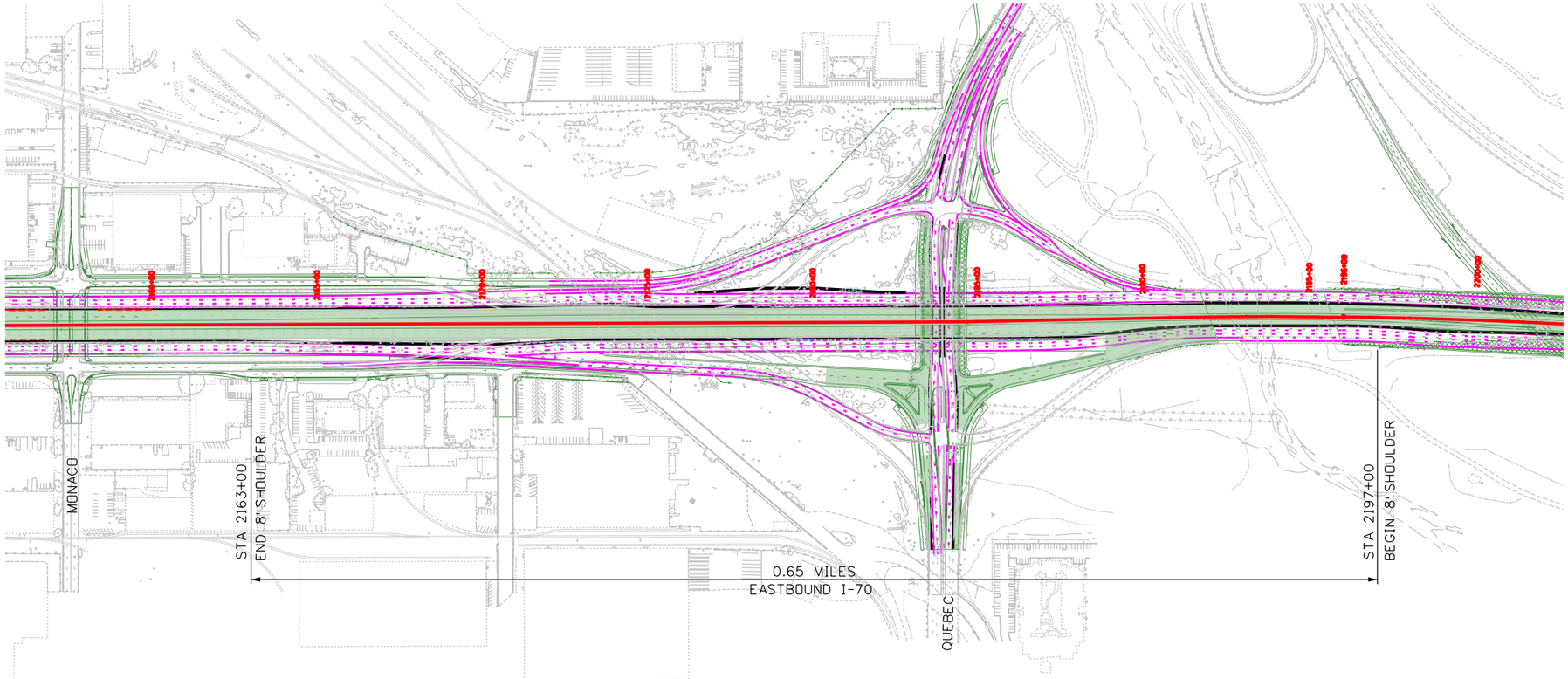
PHASE 2 STAGE 1
EASTBOUND I-70



ATC-43

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Unit Information
Unit Leader

Front Range Mobility Group

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Void:

ATTACHMENT A
TEMPORARY EMERGENCY PULLOUT/ WIDE SHOULDER LOCATIONS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: 9 of 9

Project No./Code

Sheet Number

$PLOT_INFO$

ATC SUBMITTAL

CONFIDENTIAL

Central 70

DATE: August 31, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 43.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 43.0 was reviewed by the Procuring Authorities prior to the August One-on-One Meetings and an initial response was sent to you on August 4, 2016. As discussed during the August One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Conceptual ATC. The ATC proposes to use exit ramps along I-70 as emergency pullouts at spacing greater than 0.5 miles.

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.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Conceptual ATC Submission. The Procuring Authorities ask that the following items are addressed in the Detailed ATC submission:

1. Provide site specific graphics and details for the layout of the emergency pullouts.

The Procuring Authorities continue to reserve the right to modify the above evaluation and/or discuss the Conceptual ATC with FHWA and the City of Denver.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: July 13, 2016

Central 70 Project RFP: ATC Submission No. 43.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

During construction, this ATC is proposing to use temporary emergency pullouts per Schedule 10 Section 2 along I-70 and exit ramps, to provide locations for disabled vehicles and staging of incident management. This ATC also proposes revising the minimum spacing of temporary emergency pullouts to allow for spacing slightly greater than 0.5 miles. This proposal applies to the construction work zone along I-70 from east of Dalia St. to Chambers Rd.

There are varying guidelines on emergency pullout spacing within work zone areas.

The "*Virginia Work Area Protection Manual, Standards and Guidelines for Temporary Traffic Control*" provides the following guidance: "*The spacing of pull-off areas should be as follows: For projects with activity areas greater than 1.0 mile but less than 2.0 miles in length, one every 0.5 to 0.75 mile. For projects with activity areas greater than 2.0 miles in length, one every mile.*"

The Maryland DOT provides the following guidance in in their *Traffic Engineering and Safety Manual*, Application Guideline No. 6-G2: "*For work areas greater than 1 mile in length, multiple pull-off areas may be used at spacing of ½ mile acceptable, 1 mile desirable and 2 miles maximum.*"

This ATC is asking to modify RFP requirements of Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 – Emergency Pullouts in combination with spacing greater than 0.5 miles and the use of exit ramp areas for emergency pullouts.

The temporary emergency pullouts will be located at the locations show in the attached Exhibits A & B.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

This ATC is inconsistent with Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20 asking to use exit ramps for emergency pullouts and increasing the 0.5 mile minimum spacing for emergency pullouts between Dahlia St. and Chambers Rd.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

This ATC will be used as an alternative to the emergency pullout locations noted in Schedule 10, Section 2 Maintenance of Traffic, paragraph 2.11.20.

FRMG is asking to use this ATC because it provides the use of 8-ft shoulders and emergency pullouts within one mile along the corridor at the identified locations in Exhibits A & B. This will minimize the number of lane tapers and traffic shifts for the traveling public and provide a consistent travel way for motorists. This will allow for larger work zones to provide enhanced construction quality by avoiding construction in small areas and shifting traffic multiple times to provide construction access.

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

This ATC has a positive impact on safety through the work zone by providing emergency pullouts or 8-ft shoulders within one mile spacing of each other. Emergency pullouts on the exit ramps provide the safety benefit and positive impact of traffic flow by allowing disabled vehicles and incident management access off of mainline I-70 to minimize driver distraction.

This ATC has a positive impact on the environment because it reduces the amount of material needed for temporary emergency pullouts.

There are no identified negative environmental, social, economic, community, operations and maintenance or third party impacts.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

We anticipate a substantial CapEx and O&M savings under $2.5M. The saving is associated with reduction of temporary pavement, excavation and embankment, along with larger work zones allowing for more construction efficiency.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

Incorporation of this ATC will result in a saving of about two months of construction schedule associated with larger work zones and reduction of material necessary to build the Project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

Refer to Attachment No.1 (Exhibits A & B) to this document for additional information regarding the ATC request.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

The Maryland DOT and Virginia DOT provide guidance allowing for emergency pullout spacing greater than 0.5 miles. The project specifications regarding the dimensions of the pullouts would be maintained.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

n/a

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

n/a

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

n/a

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

n/a

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

n/a

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

n/a

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

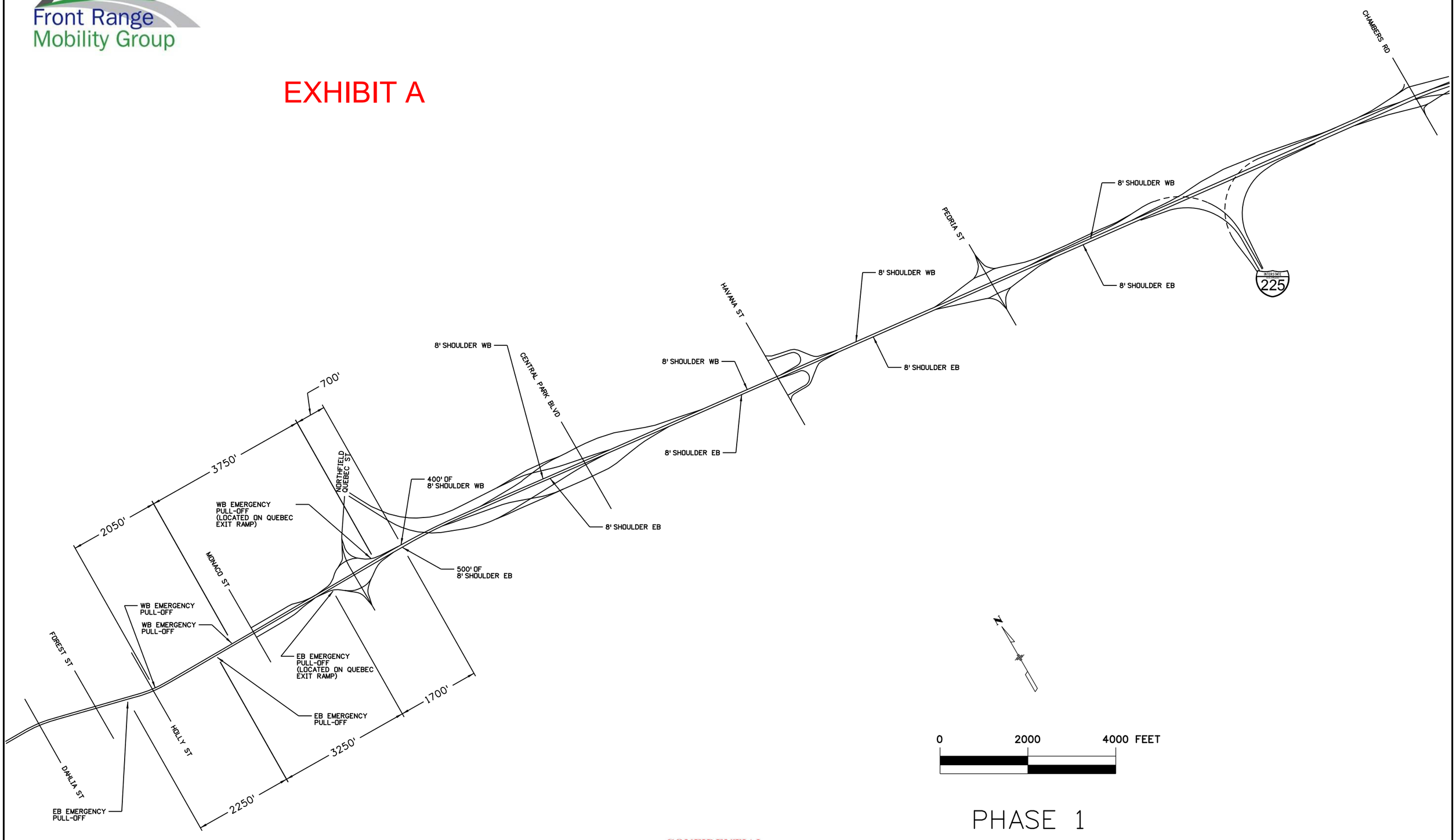
[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 43.0

CONCEPTUAL DRAWINGS

Front Range Mobility Group

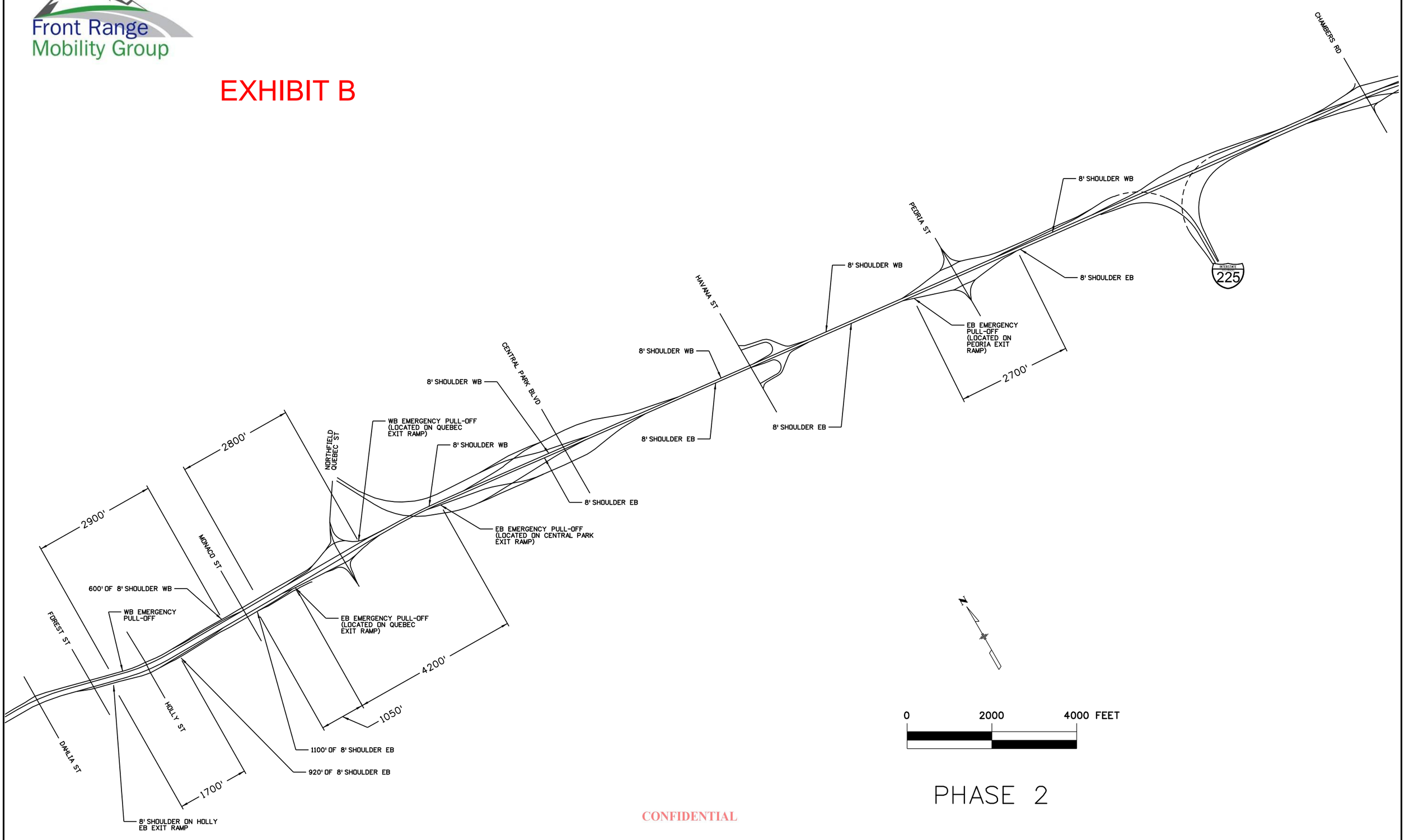
EXHIBIT A



PHASE 1

Front Range Mobility Group

EXHIBIT B



PHASE 2

ATC 45

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 45

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 45.1

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 45.1 has been reviewed by the Procuring Authorities.

Detailed ATC 45.1 proposes to implement a temporary detour of the I-70 eastbound exit to Colorado Blvd. during the construction of the proposed eastbound exit ramp to Colorado Blvd.

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 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 Front Range Mobility Group 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 Procuring Authorities have coordinated with the City of Denver regarding this ATC. The City feels that the detour presented in the ATC creates too much out of direction travel and is unlikely to gain their support.

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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 16, 2016

Central 70 Project RFP: ATC Submission No. 45.1[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☒ Previously Submitted as Conceptual ATC

☐ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

The Procuring authorities asked the following to be incorporated in the Detailed ATC submittal

(a) Provide schedule for length of closure

(b) Provide traffic analysis of detour route including intersections and identify any improvements that would be necessary for implementation of detour

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

This ATC is proposing to implement a temporary detour of the I-70 EB exit to Colorado Blvd. during the construction of the proposed EB exit ramp to Colorado Blvd. Currently, Schedule 10, Section 2, Table 2-3 states that no full closures are permitted for the I-70 EB exit ramp to Colorado Blvd.

This ATC is asking to modify RFP requirements of Schedule 10, Section 2 Maintenance of Traffic, Table 2-3 to temporarily allow for the detour the I-70 EB exit ramp to Colorado Blvd. to reduce construction costs and project duration.

In the proposed detour, traffic is detoured to the Holly St. EB exit ramp, travel north on Holly St., then west on the N Frontage Road until reaching Colorado Blvd. See Attachment A.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

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

This ATC is inconsistent with Schedule 10, Section 2, Table 2-3.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

This ATC will be used as an alternative to the I-70 EB exit ramp to Colorado Boulevard.

Because this ATC provides a larger work area which will reduce the construction cost and duration of the project, it will provide enhanced construction quality by avoiding small areas and shifting traffic multiple times. Additionally, this detour will also reduce the amount of traffic traveling through an active construction zone near viaduct demolition and trench construction, improving safety for the travelling public and the contractor.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

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

This ATC has a positive impact on the construction schedule and cost, which will benefit taxpayers, CDOT, freight and commuter traffic, and the local residents. Improved safety for the traveling public and

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

contractor within the construction zone would be expected by reducing the number of vehicles traveling in the constrained work zone. This ATC has a positive impact on the environment because it reduces the amount of material needed for temporary ramps and retaining walls. There are no identified negative environmental, social, economic, community, operations and maintenance or third party impacts. There are no additional improvements identified that would be necessary for the detour. The duration in which the detour would be implemented is three months, as detailed below:

1. Two month closure and detour for construction of a temporary I70 EB exit ramp to Colorado Blvd from the North half of the trench area, across the ultimate South half of the trench area to Colorado Blvd. (including existing viaduct removal in this area).

2. One month closure and detour for final I70 EB exit ramp to Colorado Blvd. tie-in.

Minimal additional travel time is required for the detours. FRMG has performed traffic analyses for the proposed detour route. Existing traffic volumes for Colorado Blvd., N Frontage Road, and S Stapleton Dr. (S Frontage Road) are included in the Owner provided Synchro models for 2012. Please note, 2012 PM volumes are larger than the 2012 AM volumes; therefore, only PM conditions were analyzed.

Prior to the temporary closure of the Colorado EB exit ramp, the following roadways will be completed: N & S Frontage Road from Colorado Blvd. to Holly St., Holly St. interchange, and the northern half of the Colorado Blvd. interchange. In addition, the loop ramps at Colorado Blvd. will be closed. Traffic volumes taken from the 2012 Existing Synchro model were redistributed to reflect this completed construction by using similar turning movement volume distributions as is shown in the 2035 Phase 1 Synchro model.

FRMG assumed that half of the EB I-70 Colorado exit ramp traffic traveling to SB Colorado Blvd. (resulting in 265 vehicles) will exit one ramp earlier at Steele St. to reach their destination. FRMG assumed that 75% of the EB I-70 Colorado exit ramp traffic traveling to NB Colorado (resulting in 26 vehicles) will also exit one ramp earlier at Steele St. to reach their destination.

Figure 1 - 2012 PM Existing Volumes

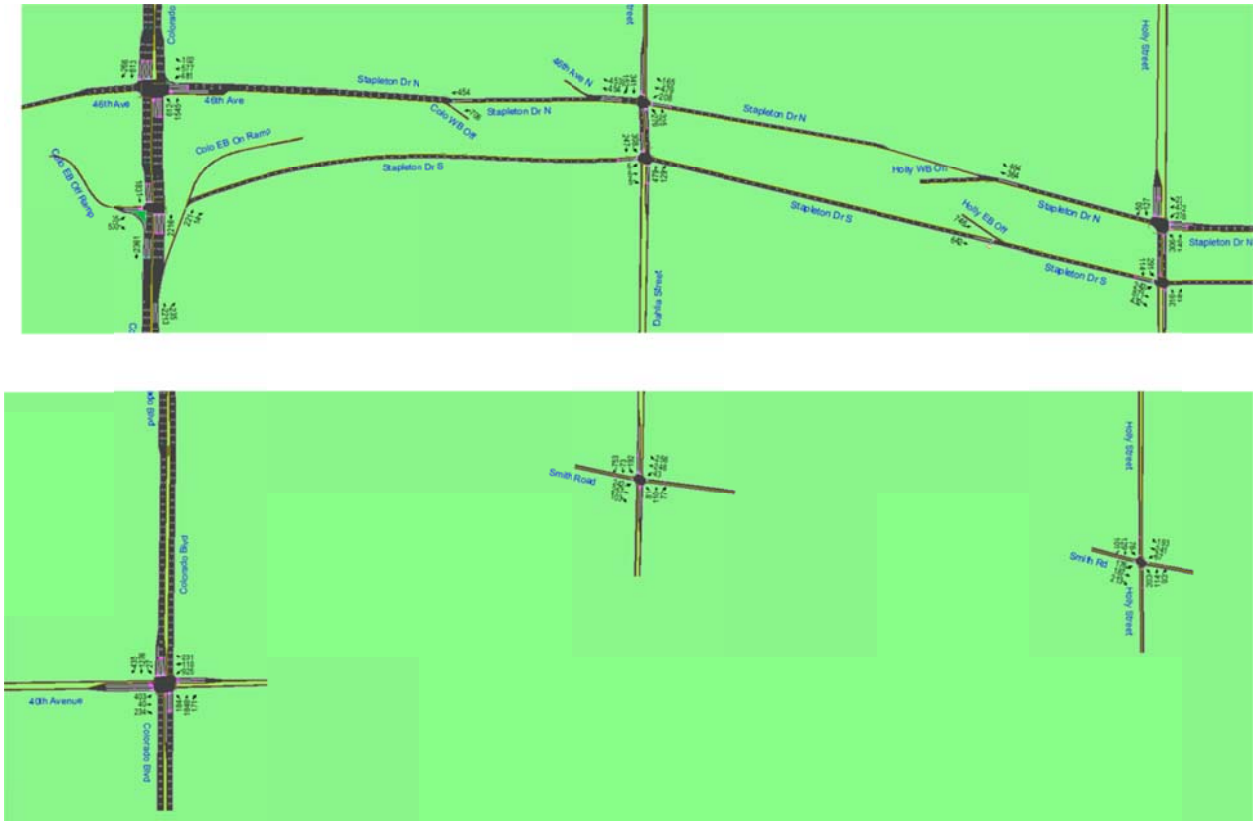


Figure 2 - 2012 PM Existing Volumes – Rerouted Detour
(Blue arrows indicate detour routes)

The traffic signals should be optimized during the detour phase to allow for the additional traffic accessing the signals. Tables 1 shows the LOS results for existing 2012 PM conditions and the optimized 2012 PM detour conditions. *Cells highlighted yellow are the movements that will see increased volumes due to the proposed detour*.

Table 1 – LOS for 2012 PM existing conditions and proposed detour

Detour: Holly St. interchange to N Frontage Road	2012 PM - Existing		2012 PM - Detour #1	
	LOS	Delay per veh (s)	LOS	Delay per veh (s)
Holly St/ S Stapleton	**B**	**12.2**	**B**	**12.7**
EB Left/Thru	B	16.1	B	15.5
EB Right	B	14.2	B	13.0
NB Thru	A	6.9	A	7.9
NB Right	A	6.0	A	6.9
SB Left	A	9.8	B	11.4
SB Thru	A	7.1	A	8.2
Holly St/ N Stapleton	**B**	**12.8**	**B**	**13.4**
WB Left	C	20.0	C	20.0
WB Thru	B	15.5	B	15.5
WB Right	B	13.0	B	13.0
NB Left	A	8.4	B	12.0
NB Thru	A	7.5	A	7.2
SB Thru	A	6.5	A	6.5
SB Right	A	6.6	A	6.6
Dahlia/ N Stapleton	**C**	**29.0**	**C**	**34.6**
WB Left/Thru	D	49.8	D	42.1
WB Thru/Right	D	37.5	C	31.0
NB Left	B	16.5	D	47.0
NB Thru/Right	A	1.7	A	5.4
SB Thru	C	29.2	D	45.8
SB Right	C	24.7	C	32.6
Colorado/46th Ave	**B**	**16.3**	**B**	**19.3**
WB Left	C	21.9	C	28.4
WB Thru	C	24.2	C	21.7
WB Right	A	0.0	A	0.0
NB Left	C	28.0	C	32.4
NB Thru	A	6.7	A	8.6
SB Thru	B	15.5	B	18.0
SB Right	C	20.4	C	24.0

All movements have a LOS D or better with the additional detour traffic.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

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

FRMG anticipates a savings with this ATC of $0.825M. The savings are associated with reduction of schedule, temporary pavement, temporary retaining walls, excavation and embankment, along with larger work zones allowing for more construction efficiency per the following:

- Temporary pavement - $250K

- Temporary Shoring - $275K
- Excavation Efficiency - $100K
- Viaduct Removal Efficiency - $200K

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

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

This ATC results in quicker and more efficient reconstruction of I-70 EB Exit ramp to Colorado Blvd., thus reducing impacts to the traveling public. This ATC does not impact the critical path of the schedule; therefore there is no reduction in the overall project schedule.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

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

Refer to Attachment A to this document for the proposed detour route.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

"This information has not been amended since the submission of the conceptual version of this ATC."

The primary tenets of MOT are to ensure safety to the public and contractor by minimizing the number of vehicles traveling through an active construction area, providing safe and effective detour routes and completing construction as quickly and efficiently as possible to minimize disruption to the residents and businesses. In order to increase safety, reduce construction costs, and reduce project duration, temporary detours are often used to by state DOTs. Closures are permitted on several ramps within the project; however, the safety, cost, and schedule benefits related to temporary detouring the I-70 EB exit ramp to Colorado Blvd. is significant.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

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

Refer to the section B.4 with reference to the additional information requested.

Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

There are no identified negative impacts with the implementation of the temporary detours for the Colorado Blvd. EB exit ramp. The proposed detour has sufficient capacity to enable alternate access to I-70 EB.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

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

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

No requirement for additional Right-of-Way is anticipated relative to implementation of this ATC.

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

No additional approvals are anticipated relative to implementation of this ATC.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

Upon approval of this ATC, Schedule 10, Section 2 Maintenance of Traffic, Table 2-3 would be modified as shown, noting the permissible closure of the I-70 EB exit ramp to Colorado Blvd.

Table 2-3 Permitted Full Ramp Closures on the I-70 Mainline from Brighton Blvd. to Chambers Blvd.

Location	Ramp	Allowed Closure
Colorado Blvd. Interchange	EB exit ramp	Full Closure allowed for up to the lesser of the period of construction and three months upon initiation of construction that affects ramp
	WB entrance (loop ramp from northbound Colorado Blvd.)	Full Closure allowed upon initiation of construction that affects ramp
	WB exit ramp	Full Closure allowed for up to the lesser of the period of construction and six months upon initiation of construction that affects ramp
	EB entrance ramp	No full Closures allowed
	EB entrance (loop ramp from southbound Colorado Blvd.)	Full Closure allowed upon initiation of construction that affects ramp

Attachment A
Design Exceptions

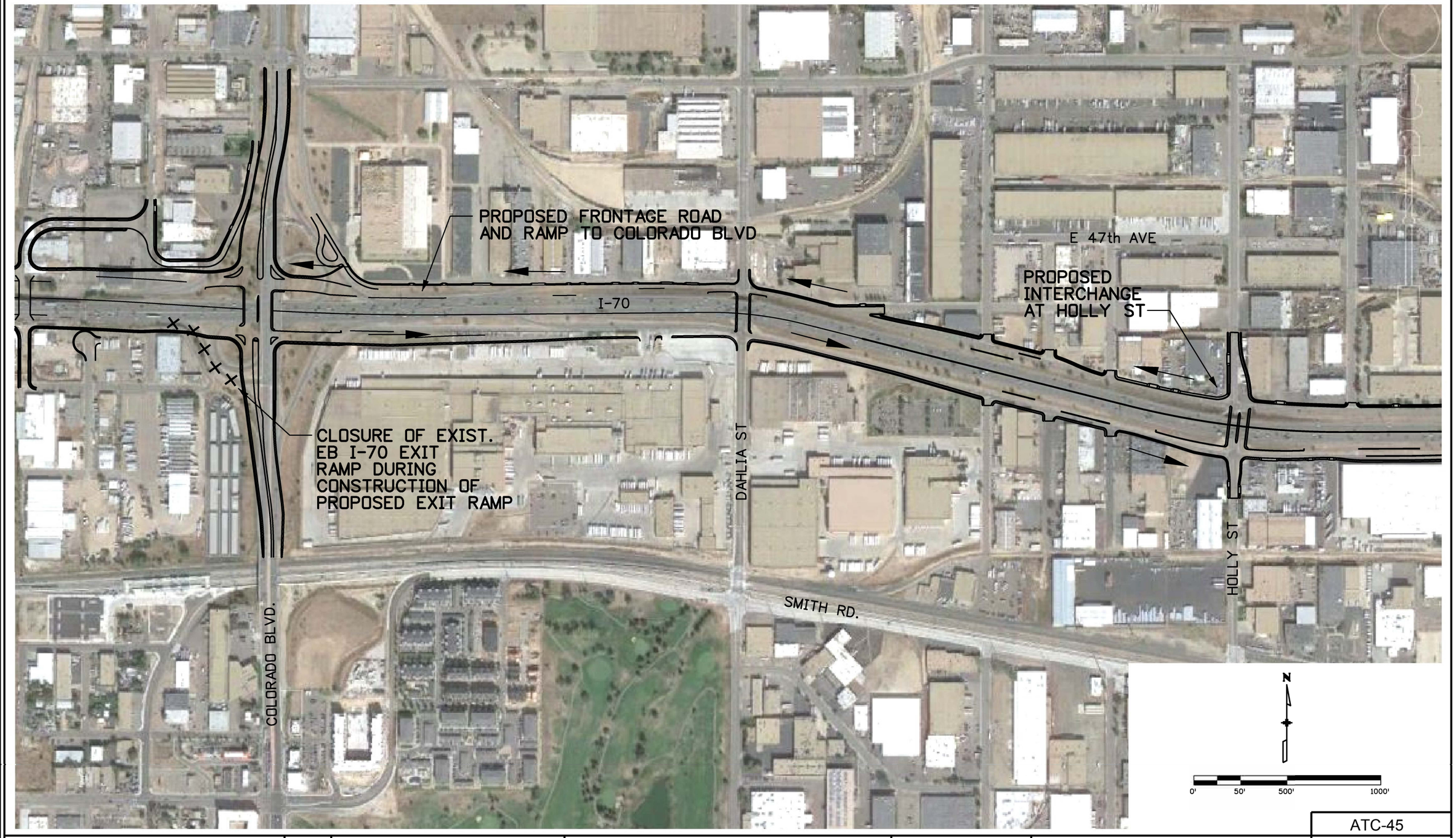
No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 45.1

CONCEPTUAL DRAWINGS

SUPPORT INFORMATION



Print Date: 10/17/2016
File Name: MDT_xhbt_ColoradoDetour01.dgn
Horiz. Scale: 1:500.001
Vert. Scale:
Unit Information
Unit Leader

Front Range Mobility Group

0000

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

As Constructed
No Revisions:
Revised:
Void:

ATTACHMENT A
I-70 EB COLORADO EXIT DETOUR

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: of

ATC-45
Project No./Code
Sheet Number

ATC SUBMITTAL

Central 70

DATE: August 31, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 45.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 45.0 was reviewed by the Procuring Authorities prior to the August One-on-One Meetings and an initial response was sent to you on August 4, 2016. As discussed during the August One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Conceptual ATC. The ATC proposes to implement a temporary detour of the I-70 EB exit to Colorado Blvd. during the construction of the proposed EB exit ramp to Colorado Blvd.

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.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Conceptual ATC Submission. The Procuring Authorities ask that the following items are addressed in the Detailed ATC submission:

1. Provide schedule for length of closure.

2. Provide traffic analysis of detour route including intersections and identify any improvements that would be necessary for implementation of detour.

The Procuring Authorities continue to reserve the right to modify the above evaluation and/or discuss the Conceptual ATC with FHWA and the City of Denver.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: July 13, 2016

Central 70 Project RFP: ATC Submission No. 45.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

This ATC is proposing to implement a temporary detour of the I-70 EB exit to Colorado Blvd. during the construction of the proposed EB exit ramp to Colorado Blvd. Currently, Schedule 10, Section 2, Table 2-3 states that no full closures are permitted for the I-70 EB exit ramp to Colorado Blvd.

This ATC is asking to modify RFP requirements of Schedule 10, Section 2 Maintenance of Traffic, Table 2-3 to temporarily allow for the detour the I-70 EB exit ramp to Colorado Blvd. to reduce construction costs and project duration.

Two (2) detour routes are proposed and shown in the attached Exhibits A & B.

Exhibit A (Option 1) proposes detouring I-70 EB traffic destined to Colorado Blvd. via the Holly St. interchange. Traffic would exit I-70 EB at the Holly St. exit ramp, turn left onto Holly St. and then travel Stapleton Dr. west to Colorado Blvd.

Exhibit B (Option 2) proposes detouring I-70 EB traffic destined to Colorado Blvd. via the Holly St. interchange. Traffic would exit I-70 EB at the Holly St. exit ramp, turn right onto Holly St. and then travel Smith Rd. west to Colorado Blvd.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

This ATC is inconsistent with Schedule 10, Section 2 Maintenance of Traffic, Table 2-3. This ATC is asking to implement a temporary detour of the I-70 EB traffic destined to Colorado Blvd. during the construction of the proposed I-70 EB exit ramp to Colorado Blvd.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

This ATC will be used as an alternative to the I-70 EB exit ramp to Colorado Blvd. requirements in Schedule 10, Section 2 Maintenance of Traffic, Table 2-3.

FRMG is asking to use this ATC because it provides a larger work area which will reduce the construction cost and duration of the project. Detouring this traffic will also reduce the amount of traffic traveling through an active construction zone near viaduct demolition and trench construction which will improve safety for the travelling public and contractor. A larger work zone will provide enhanced construction quality by avoiding construction in small areas and shifting traffic multiple times to provide Colorado Blvd. access and construction equipment access.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

This ATC has a positive impact on the construction schedule and cost, which will benefit taxpayers, CDOT, freight and commuter traffic, and the local residents. Improved safety for the traveling public and

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

contractor within the construction zone would be expected by reducing the number of vehicles traveling in the constrained work zone. Minimal additional travel time is required for the detour options. For Option 1, I-70 EB traffic destined to Colorado Blvd. is detoured approximately 2.0 miles to the arrive at the proposed Stapleton Dr./Colorado Blvd. intersection.

For Option 2, I-70 EB traffic destined to Colorado Blvd. is detoured approximately 2.4 miles to arrive at the Colorado Blvd./Smith Rd. intersection.

This ATC has a positive impact on the environment because it reduces the amount of material needed for temporary ramps and retaining walls.

There are no identified negative environmental, social, economic, community, operations and maintenance or third party impacts.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

FRMG anticipates a substantial CapEx and O&M savings under $3.0M. The saving is associated with reduction of schedule, temporary pavement, temporary retaining walls, excavation and embankment, along with larger work zones allowing for more construction efficiency.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

Incorporation of this ATC will result in a saving of about three months of construction schedule associated with larger work zones and reduction of material necessary to build the Project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

Refer to Attachment No.1 (Exhibits A & B) to this document for additional information regarding the ATC request.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

The primary tenets of MOT are to ensure safety to the public and contractor by minimizing the number of vehicles traveling through an active construction area, providing safe and effective detour routes and completing construction as quickly and efficiently as possible to minimize disruption to the residents and businesses. In order to increase safety, reduce construction costs, and reduce project duration, temporary detours are often used to by state DOTs. Closures are permitted on several ramps within the project; however, the safety, cost, and schedule benefits related to temporary detouring the I-70 EB entrance ramp from Brighton Blvd. is significant.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

n/a

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

n/a

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

n/a

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

n/a

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

n/a

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

n/a

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 45.0

CONCEPTUAL DRAWINGS

Front Range Mobility Group

PROPOSED FRONTAGE ROAD AND RAMP TO COLORADO BLVD

E 47th AVE

PROPOSED INTERCHANGE AT HOLLY ST

I-70

CLOSURE OF EXIST. EB I-70 EXIT RAMP DURING CONSTRUCTION OF PROPOSED EXIT RAMP

DAHLIA ST

HOLLY ST

COLORADO BLVD.

SMITH RD.

N

0' 50' 500' 1000'

I-70 EB EXIT DETOUR TO COLORADO BLVD. OPTION 1

Front Range Mobility Group

I-70

E 47th AVE

HOLLY ST

PROPOSED INTERCHANGE AT HOLLY ST

CLOSURE OF EXIST. EB I-70 EXIT RAMP DURING CONSTRUCTION OF PROPOSED EXIT RAMP

DAHLIA ST

SMITH RD.

COLORADO BLVD.

CONFIDENTIAL

N

0' 50' 500' 1000'

I-70 EB EXIT DETOUR TO COLORADO BLVD. OPTION 2

ATC 49

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 49

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 49.1

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 49.1 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 44.1 proposes to temporarily reduce vertical clearance requirements of I-70 under Colorado Blvd. interchange during construction of the proposed Colorado Blvd. 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).

☐ 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 December One-on-One Meeting, the Procuring Authorities have changed their initial response to your above mentioned Detailed ATC Submission. The ATC is conditionally approved.

Conditions of Approval:

1. Developer shall be responsible for the design and installation of all required traffic control for the detour.

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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 8, 2016

Central 70 Project RFP: ATC Submission No. 49.1[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☒ Previously Submitted as Conceptual ATC

☐ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

The Procuring Authorities requested that the following be addressed in the Detailed ATC submission:

1. Provide schedule for duration of height restriction.
2. Provide the planned alternate route that provides the required vertical clearances.

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

This ATC is proposes to temporarily reduce vertical clearance requirements for the new Colorado Boulevard over I-70 Bridge during reconstruction I-70.

FRMG's proposed I-70 profile at the new Colorado Boulevard Bridge is approximately 1 foot lower than of the existing profile of I-70. The proposed MOT is to maintain I-70 traffic in its current location to minimize impacts to the traveling public while constructing the new Colorado Boulevard Bridge. During the reconstruction of I-70 the vertical clearance to the new bridge will be less than 16.5 feet.

This ATC is asking for a temporary reduction in vertical clearance to **15.5 feet** over I-70 at Colorado Boulevard until the reconstruction of I-70 is completed. The conceptual temporary vertical clearance of the proposed Colorado Boulevard bridges over existing I-70 is 15.9'. The duration in which the temporary reduction in vertical clearance would be implemented is approximately 1.5 years. Once I-70 is constructed at the proposed location and profile, the proposed vertical clearance at Colorado Boulevard will be 16.5 feet.

A temporary reduction in vertical clearance would minimize the need to create more disruption to I-70 traffic and eliminate costly temporary work along existing I-70. Although the RFP does not provide guidance on reduction in vertical clearance during construction, CDOT and AASHTO do allow for reduced vertical clearances on freeway facilities with general guidance as follows:

- Chapter 3, Table 3-3, Elements of Design in the CDOT *"Roadway Design Guide 2005"* provides guidance for vertical clearance for various roadway classifications. For freeways, the vertical clearance is 16.5 feet; however, Table 3-3 notes that the vertical clearance may be reduced to as little as 14.5 feet in Special Cases. This note references the "*2004 AASHTO Policy on Geometric Design of Highways and Streets".*

- Freeways Chapter 8, page 8-4 of the "*2011 AASHTO Policy on Geometric Design of Highways and Streets"* states, "The vertical clearance to structures passing over freeways should be at least 16 feet over the entire roadway width, including auxiliary lanes and the usable width of shoulders (with an allowance for future resurfacing). In highly developed urban areas, where attainment of the 16 feet clearance would be unreasonably costly, a minimum clearance of 14 feet may be used if there is an alternate freeway facility with the minimum 16 feet clearance."

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

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

This ATC is inconsistent with Schedule 10, Section 9 Roadway, Appendix A- Roadway Design Criteria. The design criteria require 16.5 feet vertical clearance in the permanent condition. FRMG is asking to temporarily reduce vertical clearance requirements of I-70 during reconstruction to 15.5 feet at the Colorado Boulevard interchange.

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

FRMG is asking to use this ATC because it has a positive impact on the construction schedule and cost which will benefit taxpayers, CDOT, and traffic on I-70. Advanced warning messages/signs will be provided to direct vehicles with heights exceeding 15.5 feet around the construction zone. I-70 EB traffic would be directed to I-25 North to I-76 East to I-270 East. I-70 WB traffic would be directed to I-270 West to I-76 West to I-25 South. See Attachment A for the proposed detour routes.

Most truck traffic would have heights less than 15.5 feet. Therefore, a small number of trucks would be required to use the designated detour route.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

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

This ATC has a positive impact on construction schedule and costs, and the environment. The Colorado Boulevard interchange would be constructed more quickly and efficiently. There would not be a need to temporarily lower existing I-70 under Colorado Boulevard to provide vertical clearance during construction. Lowering the profile could create drainage issues and negatively impact the existing Colorado Boulevard bridge while in operation. A temporary lowering of I-70 would be costly due to temporary retaining walls, shoring, pavement, and drainage.

The proposed detour route for vehicles requiring vertical clearance more than 15.5 feet is provided in Attachment A. FRMG reviewed the vertical clearances of structures along the detour route from CDOT's Bridge Log database. Some structures are missing the vertical clearance data in the database. However, because the bridges that are missing are fairly new, the vertical clearance is assumed to be 16'-6" or greater. These clearances are denoted with an asterisk (*).

Eastbound I-70 Detour

Northbound I-25

- SH 53 – 58th Avenue over I-25 (No. E-17-RC) 17'-6" Minimum Clearance

Eastbound I-270

- York Street over I-270 (No. E-17-IC) 16'-9"
- Quebec Street over I-270 (No. E-17-ABI) 18'-4"

Westbound I-70 Detour

Westbound I-270

- Eastbound I-70 to Northbound I-270 Ramp (No. E-17-AED) *16'-6"
- Quebec Street over I-270 (No. E-17-ABI) 17'-4"
- York Street over I-270 (No. E-17-IC) 16'-8"
- Ramp under I-76 ramp from I-270 (No. E-17-QD) *16'-6"
- Ramp under I-76 Eastbound Mainline (No. E-17-QB) *16'-6"
- Ramp under I-76 Westbound Mainline (No. E-17-QC) *16'-6"

- Ramp under I-270 Westbound Mainline (No. E-17-QP) 32'-0"
- Ramp under I-270 Eastbound Mainline (No. E-17-QI) 29'-3"
- Ramp under I-270 ramp to I-76 Eastbound (No. E-17-QK) 23'-6"

Westbound I-76

- I-76 Ramp under I-76 Westbound Mainline (No. E-17-OB) *16'-6"
- I-76 Ramp under I-76 Eastbound Mainline (No. E-17-OA) *16'-6"
- I-76 Ramp under Ramp to I-25 Northbound (No. E-17-OI) *16'-6"

Southbound I-25

- SH 53 – 58th Avenue over I-25 (No. E-17-RC) 19'-4" Minimum Clearance

There are no identified negative environmental, social, economic, community, operations and maintenance or third party impacts.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

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

Incorporation of this ATC will result in an estimated savings of $1.5M. The savings is associated with reduction of temporary retaining walls, shoring, pavement, and drainage.

- Temporary Pavement Reduction $1.05M
- Temporary Wall Reduction: $ 150,000
- Temporary Drainage Reduction: $100,000
- Earthwork Reduction: $ 100,000
- MOT Simplified Scheme: $ 100,000

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

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

Incorporation of this ATC will result in a savings of about two months of construction schedule associated with reduction of activities necessary to build the Project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

Attachment A shows the proposed detour routes for vehicles with heights greater than 15.5 feet.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been

implemented, regardless of the results, and the relevance of such experience.

CDOT has permitted long term reduced clearances for bridges at the I-270 and Alameda Avenue Interchange and 80th Avenue over US 36 in Westminster.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

As indicated, the duration of the height restriction and planned alternate route have been provided in this Detailed ATC.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

There are no identified negative impacts with the implementation of the temporary vertical clearance reduction at Colorado Boulevard. The proposed detour route has sufficient vertical clearances at existing overpasses.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

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

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

No requirement for additional Right-of-Way is anticipated relative to implementation of this ATC.

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

No additional approvals are anticipated relative to implementation of this ATC.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

This ATC is inconsistent with Schedule 10, Section 9 Roadway, Appendix A- Roadway Design Criteria. The design criteria require 16.5 feet vertical clearance in the permanent condition. FRMG is asking to temporarily reduce the vertical clearance requirements of I-70 during construction to 15.5 feet at the Colorado Boulevard interchange.

Upon approval of this ATC, Schedule 10, Section 9 Roadway, Appendix A would be modified as shown, noting the temporary vertical clearance reduction on I-70 at Colorado Boulevard during construction.

Appendix A
Roadway Design Criteria

I-70 Mainline				
Design Element	**I-25 to Sand Creek (Project and Ultimate)**	**Sand Creek to Chambers Road (Project)**	**Sand Creek to Tower Road (Ultimate)**	**Remarks**
Standards Applied	CDOT/FHWA			
General				
Roadway Classification	Interstate	Interstate	Interstate	
Posted Speed (MPH)	55	55	-	
Design Speed (MPH)	60	65	70	
Design Vehicle	WB-67	WB-67	WB-67	
Horizontal Alignment Criteria				
Curve Radius (Feet) - Minimum	1,330	1,660	2,040	
Stopping Sight Distance (Feet) - At level grade	570	645	730	
Cross Slope	2%	2%	2%	
Superelevation (e_{max})	6%	6%	6%	
Clear Zone on Tangent (Feet)				
Minimum	30	30	30	Apply curve factors, as required, Per RDG
Desirable	34	34	34	
Lane Widths (Feet)	12	12	12	
Shoulder Widths (Feet) [7]				
Inside	12	12	12	
Outside	12	12	12	
Auxiliary Lanes	6	8 + 4[6]	12	
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	
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)	

I-70 Mainline				
Design Element	**I-25 to Sand Creek (Project and Ultimate)**	**Sand Creek to Chambers Road (Project)**	**Sand Creek to Tower Road (Ultimate)**	**Remarks**
Z-slope Dist (6:1 Slope) (Feet)	18	18	18	
Vertical Alignment Criteria				
K-Values				
Crest Vertical Curve	151	193	247	
Sag Vertical Curve	136	157	181	
Grade				
Maximum	4%[4]	3%	3%	
Minimum	0.75%[5]	0.5%	0.5%	
Vertical Clearance at Structures (Feet) - Minimum				
Highways/Streets Over Highway/Street	16'-6"[8]	16'-6"	16'-6"	
Cover Over Highway/Street	16'-6"	16'-6"	16'-6"	
UPRR/BNSF/DRIR under Highway/Street	23'-4"	23'-4"	23'-4"	
UPRR/BNSF over Highway/Street[1]	16'-6"	16'-6"	16'-6"	
UPRR/BNSF over Highway/Street[2]	17'-6"	17'-6"	17'-6"	
UPRR/BNSF over Highway/Street[3]	20'-0"	20'-0"	20'-0"	
Overhead Wires	21'-6"	21'-6"	21'-6"	
Pedestrian/Utilities/Sign Structures over Highway/Street	17'-6"	17'-6"	17'-6"	
Bridge Structure over Sidewalk	10'-0"	10'-0"	10'-0"	
Tolled Express Lanes (Feet)				
Buffer Width	4	4	4	
Ingress/Egress Lengths	2,000	2,000	2,000	
Weave Distance per Lane at all Ingress/Egress Locations	800	800	800	

I-70 Mainline				
Design Element	**I-25 to Sand Creek (Project and Ultimate)**	**Sand Creek to Chambers Road (Project)**	**Sand Creek to Tower Road (Ultimate)**	**Remarks**

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 - 4% maximum grade allowed between Brighton Boulevard to UPRR Bridge only, 3% maximum grade allowed east of UPRR Bridge.
5 - 0.75% minimum grade required within the Lowered Section only, 0.5% minimum grade required east of Colorado Boulevard
6 - 8 foot full depth shoulder with a 4 foot capped hard surface as per Design Exception 6 in Table 9-1 and shown in the Roadway Typical Sections in Schedule 10B
7 - Shoulder widths shall be as listed in this Appendix A unless otherwise permitted by the Approved Design Exceptions as shown in Table 9-1
8 – A temporary reduction in the vertical clearance of I-70 under Colorado Blvd. is permitted during construction of the Colorado Blvd. bridges and westbound I-70 lowered section. The minimum temporary reduced vertical clearance shall be 15'-6". The proposed detour route for high clearance vehicles shall be Approved by the Department.

Attachment A
Design Exceptions

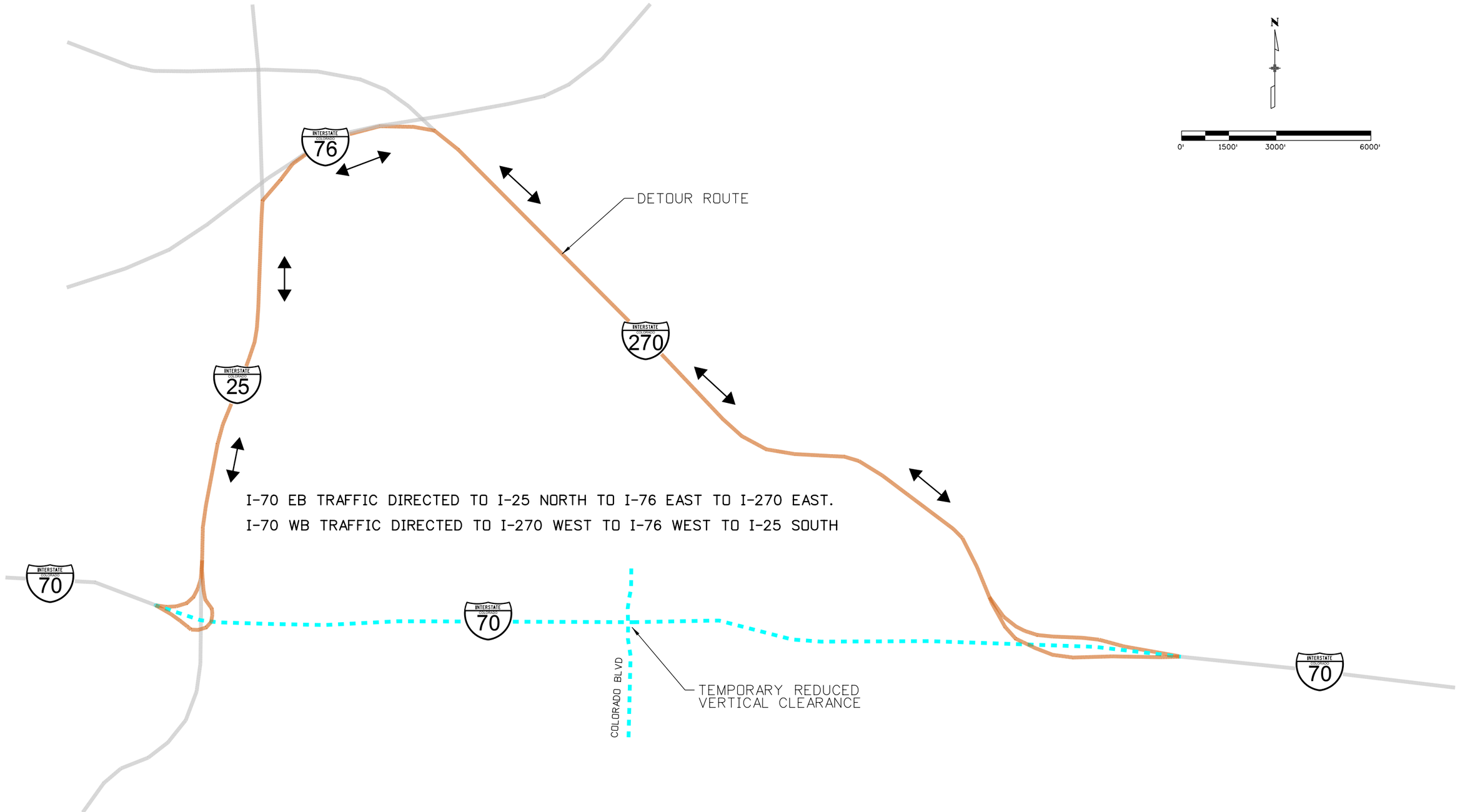
No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 49.1

CONCEPTUAL DRAWINGS

SUPPORT INFORMATION



jcheloni 4:15:57 PM c:\pw_workdir\den001\jcheloni\d0515005\l13599_MOT_Colorado_Detour.dgn

Print Date: 9/22/2016
File Name: 13599_MOT_Colorado_Detour.dgn
Horiz. Scale: 1:3000.01
Vert. Scale:
Unit Information
Unit Leader

Front Range Mobility Group

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

As Constructed
No Revisions:
Revised:
Void:

ATTACHMENT A
PROPOSED DETOUR FOR HIGH CLEARANCE VEHICLES

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: of

ATC-49
Project No./Code
Sheet Number

ATC SUBMITTAL

Appendix A
Roadway Design Criteria

I-70 Mainline				
Design Element	**I-25 to Sand Creek (Project and Ultimate)**	**Sand Creek to Chambers Road (Project)**	**Sand Creek to Tower Road (Ultimate)**	**Remarks**
Standards Applied	CDOT/FHWA			
General				
Roadway Classification	Interstate	Interstate	Interstate	
Posted Speed (MPH)	55	55	-	
Design Speed (MPH)	60	65	70	
Design Vehicle	WB-67	WB-67	WB-67	
Horizontal Alignment Criteria				
Curve Radius (Feet) - Minimum	1,330	1,660	2,040	
Stopping Sight Distance (Feet) - At level grade	570	645	730	
Cross Slope	2%	2%	2%	
Superelevation (e_{max})	6%	6%	6%	
Clear Zone on Tangent (Feet)				
Minimum	30	30	30	Apply curve factors, as required, Per RDG
Desirable	34	34	34	
Lane Widths (Feet)	12	12	12	
Shoulder Widths (Feet) [7]				
Inside	12	12	12	
Outside	12	12	12	
Auxiliary Lanes	6	8 + 4[6]	12	
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	
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)	
Z-slope Dist (6:1 Slope) (Feet)	18	18	18	

I-70 Mainline				
Design Element	**I-25 to Sand Creek (Project and Ultimate)**	**Sand Creek to Chambers Road (Project)**	**Sand Creek to Tower Road (Ultimate)**	**Remarks**
Vertical Alignment Criteria				
K-Values				
Crest Vertical Curve	151	193	247	
Sag Vertical Curve	136	157	181	
Grade				
Maximum	4%[4]	3%	3%	
Minimum	0.75%[5]	0.5%	0.5%	
Vertical Clearance at Structures (Feet) - Minimum				
Highways/Streets Over Highway/Street	16'-6"[8]	16'-6"	16'-6"	
Cover Over Highway/Street	16'-6"	16'-6"	16'-6"	
UPRR/BNSF/DRIR under Highway/Street	23'-4"	23'-4"	23'-4"	
UPRR/BNSF over Highway/Street[1]	16'-6"	16'-6"	16'-6"	
UPRR/BNSF over Highway/Street[2]	17'-6"	17'-6"	17'-6"	
UPRR/BNSF over Highway/Street[3]	20'-0"	20'-0"	20'-0"	
Overhead Wires	21'-6"	21'-6"	21'-6"	
Pedestrian/Utilities/Sign Structures over Highway/Street	17'-6"	17'-6"	17'-6"	
Bridge Structure over Sidewalk	10'-0"	10'-0"	10'-0"	
Tolled Express Lanes (Feet)				
Buffer Width	4	4	4	
Ingress/Egress Lengths	2,000	2,000	2,000	
Weave Distance per Lane at all Ingress/Egress Locations	800	800	800	

I-70 Mainline				
Design Element	**I-25 to Sand Creek (Project and Ultimate)**	**Sand Creek to Chambers Road (Project)**	**Sand Creek to Tower Road (Ultimate)**	**Remarks**

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 - 4% maximum grade allowed between Brighton Boulevard to UPRR Bridge only, 3% maximum grade allowed east of UPRR Bridge.
5 - 0.75% minimum grade required within the Lowered Section only, 0.5% minimum grade required east of Colorado Boulevard
6 - 8 foot full depth shoulder with a 4 foot capped hard surface as per Design Exception 6 in Table 9-1 and shown in the Roadway Typical Sections in Schedule 10B
7 - Shoulder widths shall be as listed in this Appendix A unless otherwise permitted by the Approved Design Exceptions as shown in Table 9-1
8 – A temporary reduction in the vertical clearance of I-70 under Colorado Blvd. is permitted during construction of the Colorado Blvd bridges. The minimum temporary reduced vertical clearance shall be 15’-6”. The proposed detour route for high clearance vehicles shall be Approved by the Department.

Central 70

DATE: August 31, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 49.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 49.0 was reviewed by the Procuring Authorities prior to the August One-on-One Meetings and an initial response was sent to you on August 4, 2016. As discussed during the August One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Conceptual ATC. The ATC proposes to temporarily reduce vertical clearance requirements of I-70 under Colorado Blvd. interchange during construction of the proposed Colorado Blvd. 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 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.

Following our discussions at the One-on-One Meeting, the Procuring Authorities have not changed their initial response to your above mentioned Conceptual ATC Submission. The Procuring Authorities ask that the following items are addressed in the Detailed ATC submission:

1. Provide schedule for duration of height restriction.
2. Provide the planned alternate route that provides the required vertical clearances.

The Procuring Authorities continue to reserve the right to modify the above evaluation and/or discuss the Conceptual ATC with FHWA and the City of Denver.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: July 13, 2016

Central 70 Project RFP: ATC Submission No. 49.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

This ATC is proposing to temporarily reduce vertical clearance requirements of I-70 underpasses at Colorado Blvd. interchange during construction of the proposed Colorado bridges over I-70.

Per the RFP plans, the proposed I-70 profile under Colorado Blvd. is 5-ft – 10-in lower than existing I-70.

This ATC is asking temporary reduction in vertical clearance to 14.5-ft of I-70 underpasses at Colorado Blvd. interchange during construction that would minimize the need to create more disruption to I-70 traffic and eliminate costly temporary work along existing I-70.

The Colorado DOT and AASHTO allow for reduced vertical clearances on freeway facilities:

Chapter 3, Table 3-3, Elements of Design in the Colorado DOT *"Roadway Design Guide 2005"* provides guidance for vertical clearance for various roadway classifications. For freeways, the vertical clearance is 16.5-ft; however, Table 3-3 notes that the vertical clearance may be reduced to 14.5-ft in Special Cases. This note references the "*2004 AASHTO Policy on Geometric Design of Highways and Streets".*

Freeways Chapter 8, page 8-4 of the "*2011 AASHTO Policy on Geometric Design of Highways and Streets"* states, "The vertical clearance to structures passing over freeways should be at least 16-ft over the entire roadway width, including auxiliary lanes and the usable width of shoulders (with an allowance for future resurfacing). In highly developed urban areas, where attainment of the 16-ft clearance would be unreasonably costly, a minimum clearance of 14-ft may be used if there is an alternate freeway facility with the minimum 16-ft clearance." This ATC is asking to modify RFP requirements of Schedule 10, Section 9 Roadway, Appendix A- Roadway Design Criteria.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3]*.*

This ATC is inconsistent with Schedule 10, Section 9 Roadway, Appendix A- Roadway Design Criteria. The design criteria requires 16.5-ft vertical clearance in the permanent condition. FRMG is asking to temporarily reduce vertical clearance requirements of I-70 during construction to 14.5-ft at the Colorado Blvd. interchange.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

This ATC will be used as an alternative 14.5-ft temporary vertical clearance at Colorado Blvd. as noted in Schedule 10, Section 9 Roadway, Appendix A- Roadway Design Criteria.

FRMG is asking to use this ATC because it has a positive impact on the construction schedule and cost which will benefit taxpayers, CDOT, and traffic on I-70. Advanced warning messages/signs will be provided to direct vehicles with loads higher than 14.5-ft around the construction zone. I-70 EB traffic would be directed to I-25 North to I-76 East to I-270 East. I-70 WB traffic would be directed to I-270 West to I-76 West to I-25 South.

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

This ATC has a positive impact on construction schedule and costs, and the environment. The Colorado interchange would be constructed more quickly and efficiently. There would not be a need to temporarily lower existing I-70 under Colorado to provide vertical clearance during construction. This could create drainage issues and negatively impact the existing Colorado bridge while in operation. A temporary lowering of I-70 would be costly due to temporary retaining walls, shoring, pavement, and drainage.

There are no identified negative environmental, social, economic, community, operations and maintenance or third party impacts.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

Incorporation of this ATC will result in a saving estimated of $ 4.0M. The saving is associated with reduction of temporary retaining walls, shoring, pavement, and drainage.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

Incorporation of this ATC will result in a saving of about four months of construction schedule associated with reduction of activities necessary to build the Project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

n/a

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

Please refer to the Overview Description regarding CDOT standards and AASHTO guidance.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

n/a

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

n/a

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

n/a

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

n/a

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

n/a

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

n/a

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC 58

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 58

Central 70

DATE: September 15, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 58.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 58.0 has been reviewed by the Procuring Authorities. The ATC proposes to keep the existing 120 inch storm sewer RCP crossing of I-70 at Forest Street in place and utilize it as part of the Central 70 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.

On the basis that the ATC submitted contains sufficient information for the Procuring Authorities to make a determination whether or not to approve the relevant ATC for incorporation in your Proposal, consistent with Section 3.1.2.a. of Part C of the ITP, the Procuring Authorities hereby waive the requirement for re-submission as a Detailed ATC and approve the ATC subject to the following conditions.

Conditions of approval:

1. FRMG shall inspect the 120 inch storm sewer crossing.

2. FRMG shall submit a report detailing the condition of the storm sewer crossing to the Procuring Authorities for Approval. The report shall include recommended maintenance work that needs to take place on the storm sewer crossing.
3. FRMG shall undertake and be responsible for any costs associated with required maintenance work on the storm sewer crossing. If the results of the inspection show that the existing condition of the storm sewer crossing has sufficiently degraded, as determined at the sole discretion of the Procuring Authorities, FRMG shall be responsible for replacing the crossing in its entirety.
4. The existing storm sewer crossing, including any repairs, shall meet the handback requirements at the end of the Term.

The approval of this Conceptual 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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: August 15, 2016

Central 70 Project RFP: ATC Submission No. 58.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

This ATC requests to keep the existing 120-in storm sewer RCP crossing of I-70 at Forest St in place and utilize it as part of the Central 70 Project.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

Addendum 3 Schedule 10, Section 8.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

The existing 120-in RCP storm crossing in Forest St. was installed approximately 10 years ago and has been accepted by City and County of Denver at that time. Concrete pipe typically has a life expectancy of 100 years plus. The current pipe is 10 years old so 90% of the life expectancy still exists for this existing storm sewer. The remaining life expectancy of the pipe exceeds the requirements of the Central 70 Project.

This ATC aligns with the project goals of optimizing the scope of the transportation and supporting infrastructure delivered through the Project in order to promote corridor wide economic and community vitality. Cost savings will be reinvested into the overall project increasing infrastructure provided to the Owner.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

This ATC has a positive impact on the environmental by eliminating the need for building a new drainage crossing at that location. There are no identified negative impacts.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

Incorporation of this ATC will result in a saving estimated of $ 750,000. The saving is associated with using the existing drainage crossing instead of building a new system.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

Incorporation of this ATC will result in a saving of about six weeks of construction schedule associated

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

with reduction of activities necessary to build the Project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

n/a

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

It's common practice in transportation projects to analyze the existing drainage structures and reutilize them if they meet the Project requirements.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

n/a

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

n/a

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

n/a

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

n/a

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

n/a

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

n/a

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC 65

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 65

Central 70

DATE: April 20, 2017

TO: Front Range Mobility Group (FRMG)

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
Front Range Mobility Group - ATC No. 65.2

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 65.2 was previously reviewed by the Procuring Authorities prior to the April One-on-One Meetings. As discussed during the April One-on-One Meeting, the Procuring Authorities committed to provide a final response to your Detailed ATC.

The ATC proposes to shift I-70 north between Brighton Boulevard and Colorado Boulevard.

☐ 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:

1. The implementation of the DPS Phase 3 School Layout will occur during the summer of 2018. FRMG shall be responsible for any and all costs and schedule risks associated with reconfiguring these improvements. CDOT and FRMG shall agree upon a protocol for renegotiating the MOA between CDOT and DPS if FRMG is selected as Preferred Proposer; however, FRMG shall remain solely responsible for all risks associated with such renegotiation.
2. FRMG shall be solely responsible for any and all costs and schedule risks associated with modifications to and/or approval of:
    a. the UPRR Trackwork and Signal plans;
    b. BNSF Trackwork and Signal plans;
    c. revisions to the ROW parcels for the UPRR;

d. revisions to the ROW parcels for the BNSF;
e. consequential amendments to the UPRR RRA; and
f. consequential amendments to the BNSF RRA.

3. FRMG shall be solely responsible for the performance of and all costs associated with any additional Utility Work required to implement this ATC.
4. FRMG shall be responsible to obtain any other Permit or approval required from any Governmental Authority, Utility Owner, or third party (including Denver Wastewater and Denver Water).
5. FRMG shall be responsible for obtaining any additional Environmental Approvals required for the implementation of the ATC. FRMG shall further be responsible for the cost and risk associated with obtaining such additional Environmental Approvals, including:
   a. conducting all public outreach that is, in the sole determination of the Department, necessary or appropriate for the implementation of this concept;
   b. all risk associated with FRMG's performance of any reevaluations required to comply with NEPA; and
   c. delays (including delays to the time for achieving Financial Close) arising as a result of the implementation of this ATC.

   For clarity, FRMG will not be permitted to separately engage with third-parties regarding the items described in this condition prior to NTP1. If FRMG is selected as the Preferred Proposer, the Department anticipates working with FRMG prior to NTP1 to develop an appropriate schedule and protocol (in the Department's discretion) for conducting the work necessary to satisfy this condition.
6. FRMG shall be responsible to obtain any Additional Right-of-Way required to implement the ATC;
7. FRMG shall be solely responsible for all cost and risk associated with gaining approval from FHWA for the design exceptions listed in the ATC.
8. FRMG shall be solely responsible for any cost and delay associated with implementation of the Reference Design in the event FRMG is unable to satisfy any of the conditions to 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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: March 27, 2017

Central 70 Project RFP: ATC Submission No. 65.2[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☐ Previously Submitted as Conceptual ATC

☒ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

In a letter dated March 17, 2017, the Procuring Authorities requested that FRMG address the following items in a Re-submission of this Detailed ATC. FRMG's response to these items is included in Section B.9 of this ATC.

1. The design submitted in the ATC does not reflect the final RFP contract requirements. Please update the ATC to show the final RFP requirements. This shall include, but not be limited to the revised lane configurations, the sidewalk widths, the access locations, and the accommodation of the DPS Phase 3 School layout.

2. Note that the full Air Quality Analysis modeling referenced in your response needs to be based on the modeling input parameters used in the Record of Decision, including the 2040 traffic projects (projections?) Also, please provide an update on the schedule for delivering the full air and noise analyses.

3. The Procuring Authorities believe that not enough information has been provided at this time to conclude with certainty that the ATC will require a Level II Reevaluation. If the ATC were to require a Level IV Reevaluation, please outline the process that FRMG will follow to manage the additional risks and possible schedule implications of the more robust reevaluation.

4. The additional ROW that is identified in the ATC submission does not account for the soil nails that are shown in the cross sections. If soil nails are used, additional ROW will be required to encompass the extent of the nail. Please clarify if additional ROW will be required.

5. If this ATC is implemented, the Procuring Authorities believe it will be necessary to shift ownership and maintenance responsibility of the portions of 46th Avenue overhanging I-70 from the City of Denver to the State, which will in turn add those segments of 46th Avenue to the Developer's O&M responsibility. The handback Requirements in Schedule 12 will apply to the additional structures. In your resubmittal, please confirm if this is consistent with FRMG's understanding, and if not, describe the cost implications of adding the associated O&M Work and Renewal Work to the Developer's

[1] Proposers to complete in accordance with instruction (2) to the Annex.

scope.

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

This ATC will:

- Reduce the Project Schedule by 6 to 8 months
- Allow opening of WB Tolled Express Lane 12 months earlier
- Reduce construction duration at Swansea School by 12 months
- Provide aesthetic/mobility enhancement to Neighborhoods
- Maximize Efficiency and Quality throughout the Project Lifecycle

The Central 70 Project is essential to improving mobility along I-70 and reconnecting neighborhoods in the surrounding community. However, the construction of this project means unavoidable impacts to the day-to-day lives of those who depend on I-70 for transportation needs and who live and work adjacent to the project corridor. To address these concerns, FRMG is proposing an ATC to realign I-70 between Brighton Boulevard and Colorado Boulevard, shifting it north approximately 45 feet as compared to the Reference Design. In moving I-70 to the north, a small portion of 46th Avenue North will overhang I-70 WB lanes supported by straddle bents across the WB roadway.

The ATC allows for nearly full construction of the trench portion of I-70 while maintaining traffic on the existing viaduct. This results in reduced impacts on the community and public, as well as faster, less-segmented construction phasing.

As the Elyria and Swansea Neighborhoods are critical community elements and central to the success of the Central 70 Project, FRMG appreciates the significant, long-term efforts that have gone into advancing the environmental review process and the IGA with the City and County of Denver. We view the following ATC as precisely aligned with these efforts and with the goals for the Project. This ATC will accelerate benefits for stakeholders including the traveling public, and particularly the local community. In response to the Procuring Authorities' comments at the One-on-One meetings, this ATC preserves all connectivity and access from the Reference Design, and includes only one minor subsurface ROW acquisition, measuring approximately 12 feet by 265 feet at the Swansea Elementary School, to accommodate I-70 below grade in the tunnel portion of the Lowered Section, with no impact or loss of function on the surface.

FRMG strongly believes this ATC will minimize impacts to the community both during and after construction, minimize impacts to the traveling public during construction, and maximize efficiency and quality throughout the project lifecycle. This ATC has been drafted with collaborative input from designers, constructors, O&M and NEPA experts who considered the cost and benefits from the perspectives of responsiveness to the community as well as responsible stewardship of taxpayer dollars. Preliminary, verbal input from the Procuring Authorities has been incorporated as well.

The following is an overview of the proposed ATC elements:

Project Commitments	Maintenance of Traffic	Design & Construction
▪ Maintaining the cover structure and park and associated elements as shown in the Reference Design. ▪ Maintaining all connectivity and local access as in the Reference Design.	▪ Greatly simplified maintenance of traffic scheme that keeps traffic on the existing viaduct while the trench section is being constructed, resulting in less impact from construction and safer passage through the construction zone. ▪ Allows for greater capacity of 46th Avenue during construction due to greater separation from the excavation activities along the Lowered Section.	▪ Nearly full construction of the Lowered Section in a single phase, reducing "overlap" with the existing viaduct structure. ▪ Allowing the construction of bridges crossing I-70 in a single phase at Vasquez, Josephine, Columbine, and Clayton Streets. ▪ Simplifying construction of bridges crossing I-70 at York, Monroe, Fillmore, and Cook Streets through reduced conflicts with viaduct columns. ▪ Overhanging a small portion of 46th Avenue North over the WB lanes of I-70 on either side of the cover structure.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate the proposed ATC[3].

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

- Schedule 10, Section 9.4.2.c.ii.A: "The Steele Street/Vasquez Boulevard westbound entrance ramp shall provide a minimum of 750 feet dual ramp meter queuing as measured from the ramp meter stop bar to the cross street."

  This ATC provides approximately 600 feet dual ramp meter queuing.

- Schedule 10, Section 9, Appendix A Roadway Design Criteria: "Shoulder width requirement for Vasquez Boulevard WB Entrance Ramp is 8 feet."

  This ATC provides an 8-foot outside shoulder width for the first 300 feet of the Steele WB Entrance Ramp, and the remaining 1300 feet of the ramp has a 6-foot outside shoulder.

- Schedule 10, Section 9, Appendix A Roadway Design Criteria. "Steele Street EB Exit Ramp shall have a maximum grade of 5%."

  In order to construct the majority of the tunnel in one phase while the existing viaduct remains in place and maintain the Steele Street EB exit ramp terminal in the location shown in the Reference Design, the grade on the Steele Street EB exit ramp is 6%.

- Schedule 10B, Contract Drawings, Roadway Typical Sections: The sidewalk width requirements are prescribed in the typical sections for each segment of sidewalk.

  To accommodate the minor changes along 46th Avenue North, there are 2 segments of sidewalk that do not meet the typical sections. These include York Street to Josephine Street, where a 10-foot attached sidewalk is proposed (8-foot sidewalk and 8-foot tree lawn shown in typical sections), and Josephine Street to Columbine Street where a 10-foot attached sidewalk is proposed (5-foot sidewalk and 5-foot tree lawn shown in typical sections). There are other segments where FRMG proposes a 10-foot sidewalk or path, exceeding the width prescribed in the typical sections.

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

As stated in the ATC overview, FRMG seeks to further build on the Procuring Authorities' environmental process and the IGA with the City and County of Denver to achieve the goals of the project. This ATC will lead to earlier realization of the benefits of this project for the local community and the traveling public. To re-emphasize our rationale for this ATC, the realignment of I-70 between Brighton Boulevard and Colorado Boulevard to the north will result in the following benefits for key stakeholders:

Table ATC-1.

	Direct Benefits for:		
	CDOT	Elyria and Swansea Community	Traveling Public
Overall ATC Results:	*Maximized efficiency and quality throughout the project lifecycle*	*Minimized impacts to the community both during and after construction*	*Minimized impacts to the traveling public during construction*
ATC Proposal Elements			
Nearly full construction of the Lowered Section in a single phase by realigning I-70 to the north of the Reference Design	▪ Faster, less-segmented construction phasing reducing the project schedule by 6 to 8 months ▪ Potential Earlier opening of the WB Tolled Express Lane ▪ Reduced costs through shortened schedule ▪ Construction of the Vasquez, Josephine, Columbine, and Clayton structures in a single phase ▪ Simplified phasing of the York, Cook, Fillmore, and Monroe structures ▪ Streamlined efficiency with fewer interfaces during construction (less coordination required for vendors/subs) ▪ Increased consistency, continuity, and quality in un-interrupted delivery ▪ Improved Safety	▪ Reduced community impacts from construction, including traffic disruption, dust and equipment air emissions, noise, and general inconvenience ▪ Reduced pressure on local roads and detour routes ▪ Improved Safety ▪ Shorter duration to endure construction including at Swansea Elementary School where construction adjacent to the school will be 12 months shorter ▪ Additional landscape, sidewalks, paths, and urban design amenities to enhance the corridor and the neighborhoods in the project vicinity.	▪ Improved Safety ▪ Simplified traffic control ▪ Fewer lane shifts and traffic pattern changes ▪ Allows for greater capacity on 46th Avenue during construction due to greater separation from the excavation in the Lowered Section. ▪ Reduced travel time with minimized lane closures and detours

Alignment with the Project Goals:

This ATC clearly aligns with the Procuring Authorities' project goals and as outlined in the following table and provides the Procuring Authorities with an option to realize these goals faster. While FRMG understands the challenges that the Project creates along the I-70 Corridor, including the impacts to the Elyria and Swansea Neighborhoods, this ATC supports all existing goals and provides an option to accelerate and ease the impacts of construction, benefiting all impacted parties as shown in Table ATC-2 below.

Table ATC-2.

This ATC is aligned with Project Goals and is proposed to accelerate construction through full construction of the depressed trench section while maintaining traffic on the existing viaduct.

Project Goals	Alignment (Y or N)	ATC Key Benefits in Alignment with Goals
1. Optimize the scope of the transportation and supporting infrastructure delivered through the Project in order to promote corridor-wide economic and community vitality.	☑ Yes	▪ Meets the needs of the neighborhood with the best use of taxpayer dollars ▪ This ATC promotes corridor-wide economic and community vitality
2. Optimize operating and life cycle maintenance costs by delivering a Project using quality design, materials and techniques.	☑ Yes	▪ Increases consistency and quality in single-phase delivery, thereby minimizing future rehabilitation needs and resulting disruption to traffic. ▪ Maximizes efficiency in project approach (streamlined coordination)
3. Minimize impacts to the traveling public, businesses and nearby communities during and after construction.	☑ Yes	▪ Reduces impact by maintaining existing lanes and speeds ▪ Reduces pressure on local roads and detour routes ▪ Less rerouting means less negative impact to local business
4. Once operational, ensure reliable travel speeds in the managed lanes and, for all lanes, a minimum appropriate standard of maintenance.	☑ Yes	▪ Reliable travel speeds will be obtained in the managed lanes and maintenance requirements met for all lanes
5. Utilize a collaborative process to enhance community values and Project benefits.	☑ Yes	▪ ATC drafted from collaborative input from designers, constructors, and NEPA experts ▪ Together, considered both environmental and community issues and responsible stewardship of taxpayer dollars ▪ A collaborative approach will be used with the Procuring Authorities for implementation of this ATC.
6. Protect the safety of the workforce and public.	☑ Yes	▪ Increases safety of workforce in physical construction separation from ongoing traffic ▪ Increases safety of public with fewer lane shifts and maintaining existing traffic pattern longer

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

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

The following Table ATC-3 provides a preliminary impact analysis associated with implementation of this ATC. The analysis takes into consideration the potential change in impacts when compared to the impact conclusions in the FEIS for the Reference Design. The analysis also shows that this ATC is not expected to have negative environmental effects, and in fact, that it will have beneficial or similar environmental and social/economic impact to the Reference Design. FRMG has performed due diligence to address both air quality and noise impacts as requested by the Procuring Authorities and has determined that there are no negative impacts. This is further discussed in Section B.9, Additional Information.

This ATC will result in a significant reduction in construction duration (an estimated reduction of 6 to 8 months). Impacts that are linked to the duration of construction, such as traffic disruption, construction noise and air quality particulate emissions would be reduced generating beneficial effects.

This ATC will require a small strip of additional ROW measuring approximately 12 feet by 265 feet (Lots 17 and 32 of Parcel RW-63) for subsurface use (Lowered Section of I-70) at the Swansea Elementary School where I-70 will be shifted to the north in its Lowered Section location. There will be no loss of function or impact to the school.

Table ATC-3.

EIS Categories not expected to be impacted or result in Positive impacts by this ATC

Environmental Category	Explanation
Social and Economic Conditions	The reduction in construction duration would have a corresponding positive effect on temporary road closures and traffic detours, as well as reducing impacts associated with access to businesses and public services. Impacts to Swansea Elementary School will also be reduced based on shorter construction duration adjacent to the school.
Visual resources & aesthetic qualities	No negative visual effects are expected as a result of implementing this ATC. The project will be designed in accordance with the Aesthetic Design Guidelines established for the project.
Parks and recreational resources	Recreational opportunities are improved through enhanced bike and pedestrian facilities and connectivity (sidewalks and paths) along the corridor.
Air Quality	Preliminary CO and PM air quality analysis supporting this ATC show that impacts will be below the NAAQS standard and below or equivalent to impacts disclosed in the FEIS. Based on the construction schedule being reduced with this ATC, construction generated air pollutant emissions would be significantly reduced. Therefore, no adverse air quality effects are expected as a result of implementing this ATC.
Energy	Significant energy consumption differences are not expected as a result of this ATC. A shorter construction schedule will reduce overall energy consumption.
Noise	Preliminary noise emission modeling supporting this ATC shows negligible changes in noise levels at sensitive receptors. Based on the construction schedule being reduced as a result of the ATC, the duration of construction generated noise impacts would be significantly reduced. Adverse noise effects are not be expected by implementing this ATC.
Section 4(f) and Section 6(f)-Recreation Resources	No additional effects on Section 4(f) or 6(f) resources are expected. No net change in available parkland would result from this ATC.
Traffic	This ATC will lead to simplified traffic control during construction with fewer lane shifts and traffic pattern changes. This will result in reduced travel time with reduced lane closures and minimized detours. Improved safety is expected since construction will be separated from the existing highway for a longer duration.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

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

FRMG anticipates net savings of $30M to the Base MPP over the term of the Project associated with the components of this ATC due to efficiencies achieved through streamlined schedule and ability to construct the majority of the Lowered Section in a single phase.

In addition to the direct cost benefits and savings, there are many intangible benefits to the community and travelling public with a shortened construction schedule, and safer construction phasing and maintenance of traffic. Ultimately this ATC would benefit those living and commuting in the Elyria and Swansea Neighborhoods as well as the Greater Denver Area.

The breakdown of savings is offset by additional costs as follows:

Cost Savings Items -- $43.55M Base MPP over the term of the Project

- Reduced schedule and associated Project Management -- $14,000,000
- Demolition -- $1,050,000
- Excavation and Dewatering -- $3,500,000
- Support of Excavation -- $6,000,000
- Roadway and Structures elements -- $4,500,000
- Maintenance of Traffic -- $3,500,000
- Cover Structure, Temporary Electrical, Lighting, ITS and Mechanical -- $11,000,000

Added Cost Items – ($13.55M) Base MPP over the term of the Project

- Support of existing viaduct during trench construction – ($1,875,000)
- Additional Structures (46th Avenue North overhang and bridge widening for wider paths/sidewalks) – ($9,000,000)
- Utility Accommodation (including storm sewer) – ($450,000)
- Landscaping and Aesthetic Enhancements – ($2,225,000). FRMG has included this allowance to incorporate landscape and aesthetic enhancements in the available space created with this ATC on the south side of I-70 and nearby areas to improve pedestrian connectivity and aesthetic consistency. See Attachment M for a concept layout of potential enhancements that has been refined through discussions with the Procuring Authorities at One-on-One meetings. Components included in the concepts are:
    - 35,500 SF of additional sidewalk (including 3,600 SF of bridge widening for 8-foot paths with 2-foot buffer width on bridges at 6 locations and 31,900 SF of at-grade new and widened paths
    - 149,700 SF additional Irrigated Landscaping (including 47,540 SF in the additional space created by ATC 65, and 102,160 SF in nearby areas)
    - 175 additional trees

In lieu of these components, FRMG is open to incorporating recommendations by the Procuring Authorities for included amenities within the Base MPP over the term of the Project allowance of $2.225M.

This ATC would provide availability for opening of the WB Tolled Express Lane approximately 12 months earlier, which could generate revenue for HPTE.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

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

A detailed schedule analysis shows the benefits and positive impacts of this ATC on the schedule. This ATC will result in fewer phases of construction, consistent delivery, and streamlined efforts. A preliminary assessment based on this ATC and the ability to accelerate and combine construction phases indicates an overall schedule savings of **6 to 8 months** off the project's critical path schedule.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

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

Several exhibits are attached to this ATC re-submission to further illustrate the aspects of this ATC where the Procuring Authorities have asked for additional information. In this re-submission, Attachment A-1 shows the revised layout of ATC 65 with the requirements of the Final RFP incorporated. Attachment H shows FRMG's approach to the Phase 3 access to Swansea Elementary School as well as the temporary wall location shifted north to the Proposed ROW line.

*Please also note that the information below **has not** been amended since the submission of the previous version of this ATC. The attachments described below can be found with the previous submission.*

Attachment A shows the layout of the project with ATC 65 incorporated. The Cover section and cross-street bridges are shown in purple, the portion of 46th Avenue that would be constructed over I-70, supported by straddle bents at key locations is shown in red, and the available space on the south side of I-70 in yellow. It should be noted that adjacent to the bridge crossings of I-70, the straddle bents will be incorporated into the bridge crossings for an integrated appearance with the bridges.

Attachment B shows typical sections through the cover at the Swansea Elementary School in FRMG's Base Design, and with ATC 65. In these typical sections, it can be seen that the Cover remains in exactly the same location with or without ATC 65. I-70 simply moves to the north under the Cover. Attachment C shows typical sections at the west portal of the tunnel with or without ATC 65. These sections also show the available space that is created on the south side of I-70 by moving it to the north.

A major benefit of ATC 65 is that it greatly simplifies the construction of the trench section. Attachments D through G show the sequence of construction with ATC 65. In Phase 1, Stage 1, the majority of the trench is constructed. I-70 traffic is maintained in its current location on the existing viaduct. Existing 46h Avenue is maintained for East-West traffic. In Phase1, Stage 2, WB I-70 traffic is moved to its permanent location in the trench. Construction of the trench is completed after the existing WB viaduct is demolished at the west tie-in point. In Phase 2, Stage 1, EB I-70 traffic is moved to its permanent location in the trench, the existing EB viaduct is demolished, and 46th Avenue South is constructed.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

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

This is an optimization specific to the Central 70 Project. However, similar configurations of frontage roads or other facilities overhanging freeways are common. Several examples include I-635 and the Central Expressway, both in Dallas, Texas.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

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

The following information was requested by the Procuring Authorities in the response to FRMG's Detailed ATC. Responses follow the requested item.

1. ***Requested Information***: The design submitted in the ATC does not reflect the final RFP contract requirements. Please update the ATC to show the final RFP requirements. This shall include, but not be limited to the revised lane configurations, the sidewalk widths, the access locations, and the accommodation of the DPS Phase 3 School layout.

Response:

Revised Lane Configurations

The revised lane configurations shown in the Final RFP have been accommodated in FRMG's revised Detailed ATC. Attachment A-1 reflects these changes.

Sidewalk Widths

The sidewalk widths shown in the Typical Sections and the Sidewalk Exhibit in the Reference Documents are reflected in FRMG's revised Detailed ATC 65. Attachment A-1 reflects these changes. There are two segments of sidewalk that do not meet the typical section requirements as follows:

- The required 8–foot sidewalk and 8-foot tree lawn between York Street and Josephine Street was modified to a 10-foot attached sidewalk with ATC 65. A slight change was required in this location to minimize the 46th Avenue overhang structure and to accommodate the proposed profile west of York Street.
- The required 5-foot sidewalk and 5-foot tree lawn between Josephine Street and Columbine Street were revised to a 10-foot attached sidewalk. The intent of this 10-foot attached sidewalk is to provide a consistent shared use path along a loop around the proposed Cover and the future Cover.

There are additional sidewalk segments where the proposed sidewalk is 10 feet wide, which is wider than required in the typical sections. These segments are on both the north and south side from York Street to the west portal of the Cover and from the east portal of the Cover to Monroe Street (where the future Cover would end). The sidewalks on all bridges between York and Monroe accommodate a 10.5–foot sidewalk rather than the 8.5-foot width shown on the Sidewalk Exhibit in the Reference Documents and the Structural Typical Sections. The sidewalk widths and buffers can be revised during final design to optimize the available area for landscaping and safety.

Access Locations

- The change in access to Parcel RW-87 is shown in Attachment A-1. The cul-de-sac shown in the Reference Drawings was replaced with a hammer head to preserve the limited space in this area.

- The driveway into Parcel RW-84 is reduced in length with ATC 65, but the elevations can be accommodated in the proposed design.
- Other driveway locations shown in Attachment A-1 reflect those on the Reference Drawings.

DPS Phase 3 School Layout

In accordance with the Developer receiving property under Schedule 18 of the Project Agreement, the additional commitments by CDOT covered in the Memorandum of Agreement (MOA) between CDOT and DPS dated October 11, 2016, require additional coordination on the Phase 3 layout at Swansea Elementary School. Exhibit A, Section 4 of the MOA requires CDOT and DPS to enter into a subsequent amendment to satisfy the functional replacement elements. In particular, 4.a.i. requires that CDOT and DPS develop phasing and sequencing plans through completion as related to the school. These include interim playgrounds, other outdoor facilities, interim parking, and other temporary and site facilities. The Phase 3 exhibit provided in the Reference Documents is subject to the future amendment.

Schedule 18, Right-of-Way states that the timeline for delivery of parcels RW-66, RW-66A, RW-66B, and RW-63 to the Developer is June/July 2018. The limits of these new parcels define the new CDOT ROW for the Project. The temporary wall for the Swansea Elementary School is shown in the Schedule 29 Reference Exhibit to be located within the new CDOT ROW. Restriction of the area north of the temporary wall is in conflict with the Developer's requirement to construct the Project within the CDOT ROW. FRMG proposes to shift the temporary wall location to the proposed ROW, as shown in the attached exhibit, Attachment B. This applies to the new CDOT ROW for FRMG's Base Design as well as for ATC 65.

Schedule 10, Section 14 requires the Developer to construct Cover Planning Area 2 while the temporary wall is located as shown in the Schedule 29 Reference Exhibit. The Developer is required to complete the construction of Planning Area 2 before the temporary wall is removed. However, the portion of Planning Area 2 north of the temporary wall cannot be built with the wall in the location shown. In addition to an area at the west end of the play field, the concession/ restroom building and the associated parking in Planning Area 2 cannot be built with the temporary wall located as shown in the Reference Exhibit. Based on the scenario proposed by FRMG to locate the temporary wall on the new CDOT ROW, the playfield and concession/restroom can be built as required with Planning Area 2.

The DPS Phase 3 Reference Exhibit shows the area north of the temporary wall, within the new CDOT ROW, being used for temporary access to the school. The temporary access constructed by DPS, as currently shown, conflicts with the Developer's requirements to construct the Cover facilities in Planning Area 2. In particular, the concession/ restroom building would be located within the temporary driveway proposed by DPS, effectively cutting off all access to the school from the east. FRMG proposes a revised access arrangement that is north of the new CDOT ROW, as shown in Attachment H to this ATC re-submittal. The proposed arrangement provides the functionality desired by DPS while also ensuring that the temporary facilities can remain in place throughout the construction period, up to opening of Planning Area 2 and construction of the new school parking lot.

Other RFP Requirements

FRMG has addressed the remaining changes that were identified as part of the Final RFP in ATC 65.

2. ***Requested Information***: Note that the full Air Quality Analysis modeling referenced in your response needs to be based on the modeling input parameters used in the Record of Decision, including the 2040 traffic projects (projections?) Also, please provide an update on the schedule for delivering the full air and noise analyses.

Response: The Air Quality analysis performed by FRMG is based on 2040 traffic projections. The Air Quality and Noise Analyses are attached to this version of ATC 65 for review by the Procuring Authorities. The modelling files for Air Quality are also attached.

3. ***Requested Information***: The Procuring Authorities believe that not enough information has been provided at this time to conclude with certainty that the ATC will require a Level II Reevaluation. If the ATC were to require a Level IV Reevaluation, please outline the process that FRMG will follow to manage the additional risks and possible schedule implications of the more robust reevaluation.

   Response: FRMG understands the Procuring Authorities reservations to an early conclusion on the level of reevaluation that will be required. We have performed a thorough due diligence of the potential impacts, risks and conceptual mitigation strategies related to the design changes proposed in ATC 65 and are confident that a Level II Reevaluation is most likely. However, the following is an outline of FRMG's process to manage any additional risks and possible schedule implication if a more robust reevaluation (i.e. Level IV) is required.

   - Immediately upon execution of the Project Agreement, FRMG will meet CDOT, FHWA, and any appropriate representatives of the Environmental Programs Branch (EPB) to thoroughly discuss and define the action being reevaluated. This meeting will be a working meeting establishing the scope of effort needed to satisfy the data needs of the reviewing parties and comparative reevaluation criteria necessary to reach approval.
   - FRMG suggests a collaborative development process whereas FRMG and the reviewing parties will work collaboratively in the development and review of the reevaluation allowing for real-time resolution of comments, concerns and questions.
   - Within 10 days of the reaching agreement with the reviewing parties, FRMG will initiate a focused local agency/stakeholder outreach effort including informational notifications and strategic meetings. This effort will be focused on those affected by the design change. Feedback from this outreach will provide FRMG with guidance on the level of community acceptance/resistance to anticipate.
   - By the 5th month after execution of the Project Agreement, FRMG, in coordination with CDOT, FHWA and EPB, will initiate a focused public outreach effort using direct mailing to property owners adjacent to and within an agreed upon distance from the design change(s). This notification will include a graphic representation of the design change(s) and a comparative matrix of impacts/benefits.
   - FRMG will establish an interim milestone date associated with the results and feedback from this outreach. This milestone will determine if moving forward with the design change(s) and reevaluation will have a positive or negative impact on the overall production delivery schedule.
   - After public input has been received it will be incorporated into the reevaluation and reviewed with CDOT, FHWA, and EPB. At this point it will be determined if further public input is needed or if the reevaluation can be finalized and submitted for approval.
   - Using this strategy, FRMG anticipates an additional 45 to 60 days would be required for the completion of Level IV Reevaluation. FRMG will use this more robust reevaluation timeframe in establishing the interim milestone discussed above.

FRMG anticipates that the following changes (adverse and beneficial) to Environmental Impacts and potential additional study if needed:

- **Air Quality** - as requested by CDOT, our Air Quality Analysis modeling effort used the parameters from the ROD and 2040 traffic projections to compare potential impacts to Air Quality. The results of this modeling effort demonstrate comparable air quality between ATC 65 and the Reference Design in the FEIS and ROD. The results of this effort will be directly applicable to the reevaluation assessment and documentation.

- **Environmental Justice** – no adverse impacts related to Environmental Justice populations are anticipated but these populations will experience a net benefit through the creation of a linear open space area between York Street and Jackson Street. As per the commitments in the ROD FRMG will utilize the existing structure and format establish in the Swansea and Elyria Neighborhood Plans for community input and engagement. This net benefit can be used as mitigation action for other impacts if necessary.
- **Residential/Business right-of-way impacts** – Lots 17 and 32 of Parcel RW-63 are partially acquired as part of the Reference Design with no adverse impact to Swansea Elementary. ATC 65 will require approximately an additional 3,000 square feet of ROW from these Lots. FRMG will coordinate with the City and County of Denver and Denver Public Schools to evaluate potential impacts that may occur; however, no adverse impacts are anticipated from the additional ROW at Swansea Elementary School.
- **Noise** – as requested by CDOT in response to this ATC, our noise analysis compared potential impacts to noise receptors where the I-70 alignment would be shifted to the north. FRMG assumes that the results of this modeling effort will demonstrate negligible difference between ATC 65 and the Reference Design. The results of this effort will be directly applicable to the reevaluation assessment and documentation.
- **Visual Resources/Aesthetics** – ATC 65 is anticipated to yield additional benefits to visual resources and aesthetics though the creation of new linear open space along the southern edge of the I-70 corridor. Potential aesthetic treatments and commitments will be coordinated with the Swansea and Elyria neighborhoods using the existing structure and format establish in the Swansea and Elyria Neighborhood Plans for community input and engagement. This net benefit can be used as mitigation action for other impacts if necessary.
- **Public Engagement** – FRMG proposes to use a targeted engagement strategy with those property owners and interested parties directly adjacent to ATC 65. This targeted engagement strategy would include a detailed project "newsletter" reviewing the differences between ATC 65 and the Reference Design as approved in the ROD as a direct mail-out. As necessary, FRMG will engage the community via established means and existing organization meetings, such as Swansea Elementary PTSA meetings and Swansea/Elyria Community meetings.

Please refer to the NEPA Reevaluation Memo from AECOM in the Attachments to this ATC Submission.

4. ***Requested Information***: The additional ROW that is identified in the ATC submission does not account for the soil nails that are shown in the cross sections. If soil nails are used, additional ROW will be required to encompass the extent of the nail. Please clarify if additional ROW will be required.

   Response: In implementing ATC 65, FRMG will not require additional ROW for soil nails. We have developed a solution using cantilevered walls, and will explore other feasible options to avoid additional ROW impacts.

5. ***Requested Information:*** If this ATC is implemented, the Procuring Authorities believe it will be necessary to shift ownership and maintenance responsibility of the portions of 46th Avenue overhanging I-70 from the City of Denver to the State, which will in turn add those segments of 46th Avenue to the Developer's O&M responsibility. The handback Requirements in Schedule 12 will apply to the additional structures. In your resubmittal, please confirm if this is consistent with FRMG's understanding, and if not, describe the cost implications of adding the associated O&M Work and Renewal Work to the Developer's scope.

   Response: Regarding the two new proposed structures that would overhang portions of I-70 (46th Avenue North from Milwaukee Street to Clayton Street and 46th Avenue North from Columbine Street to York Street), FRMG confirms that both of these parallel structures overhanging I-70 would become Developer OM Responsibility in accordance with Schedule 11, Section 3.2.2c and as indicated in the

amended Schedule 11 Appendix D included with this ATC. Subsequently FRMG acknowledges that Handback Obligations included in Schedule 12 would also apply to these structures.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

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

FRMG does not envision additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of this ATC. Refer to Items 13 and 14 in Section 9, Additional Information for additional discussion regarding implementation of this ATC.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

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

There will be no changes to the handback procedures and/or the Handback Requirements. Handback Obligations included in Schedule 12 would also apply to the new structures overhanging I -70 that are a part of this ATC, specifically 46th Avenue North from Milwaukee Street to Clayton Street and 46th Avenue North from Columbine Street to York Street,

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

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

As indicated, this ATC will require one additional minor subsurface ROW acquisition measuring approximately 12 feet by 265 feet at the Swansea Elementary School, to accommodate I-70 in the Lowered Section. Since this would be a transfer of property between Denver Public Schools (DPS) and CDOT, it is envisioned that in return for the benefits to the school and community associated with this ATC, the additional property would be transferred to CDOT through modification of the Memorandum of Agreement (MOA) between DPS and CDOT. This ATC will not require additional ROW for tiebacks or soil nails as discussed in Section B.9 above.

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions).

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

The required or likely to be required approvals associated with this ATC are as follows:

- Environmental Reevaluation due to shifting I-70 to the north and storm sewer construction along Milwaukee Street and 48th Avenue to connect to an existing storm sewer in Clayton Street.
- Additional subsurface ROW acquisition (property transfer between DPS and CDOT)
- Approval by CDOT and FHWA of the Design Exceptions listed in the Design Exceptions table below.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

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

The following RFP sections will be revised as part of this ATC as follows:

- Schedule 10B, Contract Drawings would be revised to show 46th Avenue North with a 10-foot attached sidewalk between York Street and Josephine Street and between Columbine Street and Clayton Street. A note would be added to the typical sections stating "The sidewalk widths shown here are the minimum allowed. Wider sidewalks are acceptable where right of way permits."
- Schedule 10, Section 9.4.2.c.ii.A shall read "The Steele Street/Vasquez Boulevard westbound entrance ramp shall provide a minimum of ~~750~~ 600 feet dual ramp meter queuing as measured from the ramp meter stop bar to the cross street."
- Schedule 10, Section 9, Appendix A Roadway Design Criteria shall read "Shoulder width requirement for Vasquez Boulevard WB Entrance Ramp is 8 feet where attainable, and 6 feet where 8 feet is not attainable"
- Schedule 10, Section 9, Appendix A Roadway Design Criteria shall read "Steele Street EB Exit Ramp shall have a maximum grade of ~~5%~~ 6%."
- Schedule 11, Section 3.2.10 shall remain as it currently reads: "Developer shall perform the O&M Work of all landscaped and vegetated areas on the Site, with the exception of any landscaped areas on top of the Cover. The additional landscaped and vegetated areas added as part of this ATC will be covered under this provision.
- Schedule 11, Appendix D shall be modified with the additions as follows:

Existing Structure No.	**New Structure No.**	**Structure Location and Description**	**Operations and Maintenance Responsibility** (O&M Period During Construction)	**Operations and Maintenance Responsibility** (Operating Period)
N/A	TBD	46th Ave North from Milwaukee St. to Clayton St.	Developer (at completion of Milestone 3, and as per Section 2.2.2 of this Schedule 11)	Developer (as per Section 3.2.2 of this Schedule 11)
N/A	TBD	46th Ave North from Columbine St. to York St.	Developer (at completion of Milestone 3, and as per Section 2.2.2 of this Schedule 11)	Developer (as per Section 3.2.2 of this Schedule 11)

In addition, with this ATC, the Memorandum of Agreement (MOA) between Denver Public Schools and CDOT shall be modified to transfer Lots 17 and 32 of Parcel RW-63 to CDOT to accommodate implementation of this ATC.

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.	Schedule 10, Section 9.4.2.c.ii.A	The Steele Street/Vasquez Boulevard WB entrance ramp shall provide a minimum of 750 feet dual ramp meter queuing as measured from the ramp meter stop bar to the cross street.	This ATC provides approximately 600 feet dual ramp meter queuing.		
2.	Schedule 10, Section 9, Appendix A Roadway Design Criteria:	Shoulder width requirement for Vasquez Boulevard WB Entrance Ramp is 8 feet.	This ATC provides an 8-foot outside shoulder width for the first 300 feet of the Steele WB Entrance Ramp. The remaining 1300 feet of the ramp has a 6-foot outside shoulder.		
3.	Schedule 10, Section 9, Appendix A Roadway Design Criteria.	Steele Street EB Exit Ramp shall have a maximum grade of 5%.	In order to facilitate construction while the existing viaduct remains in place, the Steele EB Exit ramp gore was shifted to the east. This ATC provides 6% maximum grade in order to match the Reference Design ramp terminal location and maintain intersection spacing between the ramp terminals and 45th Avenue.		

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 65.2

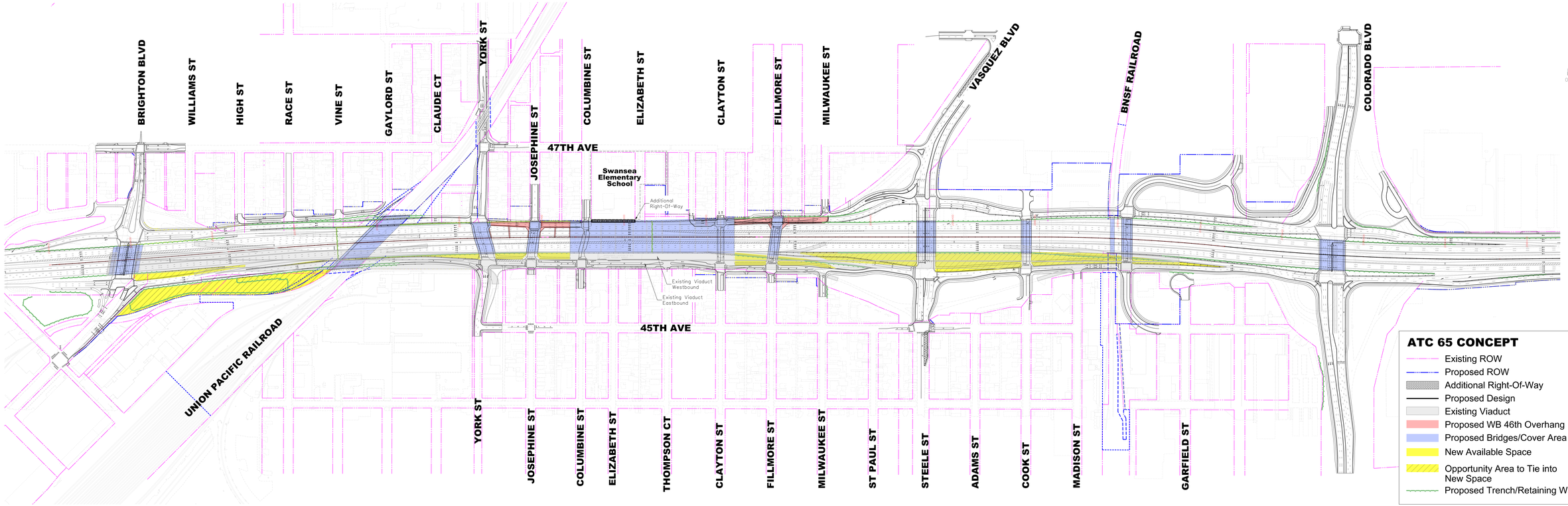
ATTACHMENT A-1

ATTACHMENT H

AIR QUALITY EVALUATION

NOISE IMPACT EVALUATION

NEPA REEVALUATION MEMO



CONFIDENTIAL

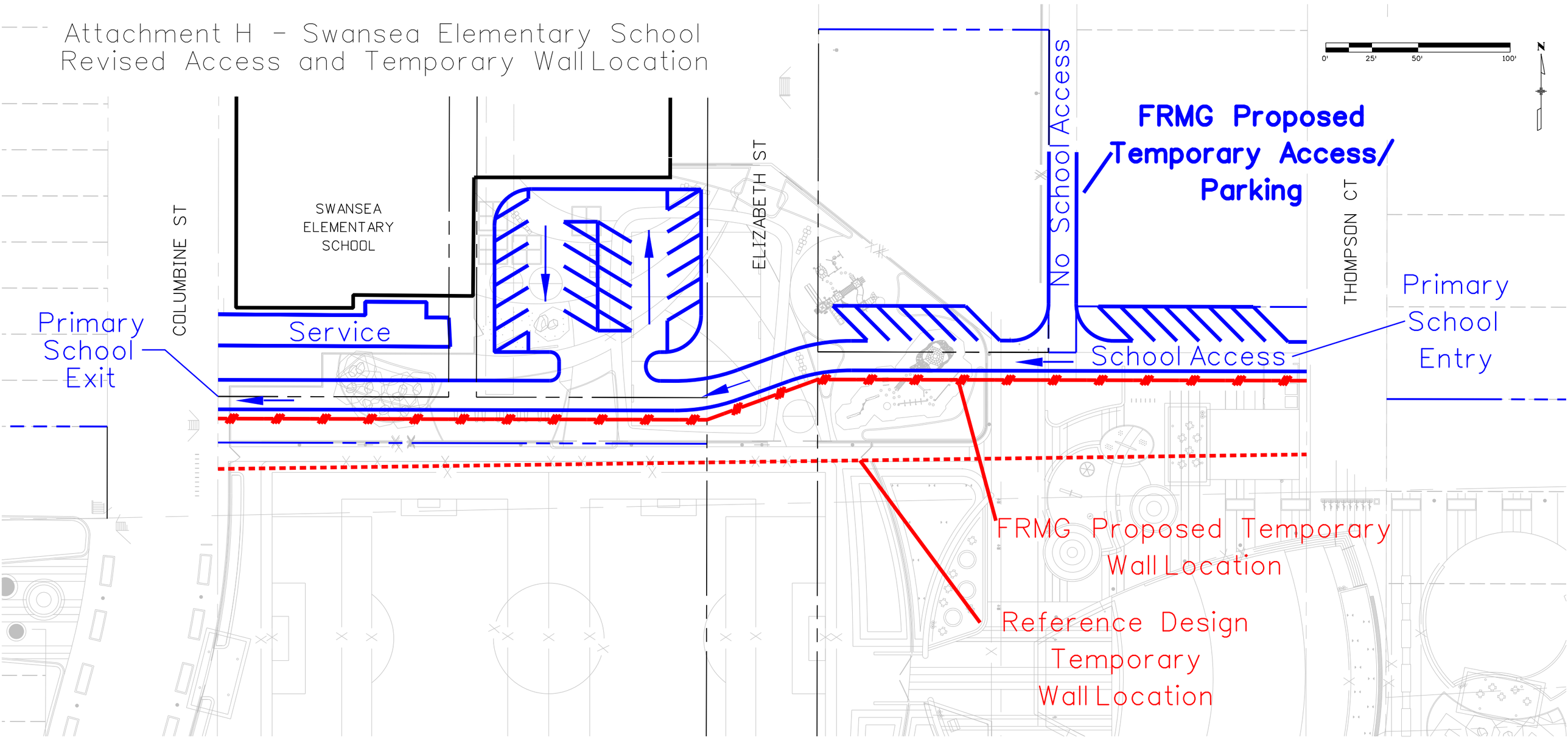
ATTACHMENT A-1 - ATC 65 LAYOUT

ATC SUBMITTAL

Print Date: 3/24/2017
File: Option Two - Attachment A (Roadway).dgn
Horiz. Scale: 1:100
Vert. Scale: -
Unit Information
Unit Leader

Front Range Mobility Group

Attachment H – Swansea Elementary School
Revised Access and Temporary Wall Location



Air Quality Evaluation of ATC 65

For

Central 70 Project

March 24, 2017

Prepared By:

Front Range Mobility Group

ANALYSIS OF ATC 65 AIR QUALITY IMPACTS

The purpose of this document is to explore how Alternative Technical Concept (ATC) 65 will alter air quality analysis conclusions presented in the I-70 East Final Environmental Impact Statement (FEIS) published in January 2016 and the associated Record of Decision (ROD) published in January 2017 for the area surrounding the Cover.

While ATC 65 only involves shifting the I-70 alignment 46 feet north in the vicinity of the Cover, this evaluation included two Cover ventilation system configurations in order to provide a comprehensive analysis. The first configuration involves a longitudinal Cover ventilation system identical to that included in the Reference Design. The other involves a transverse ventilation system with a single exhaust point.

This evaluation shows that ATC 65 impacts of particulate matter less than 10 microns in diameter (PM_{10}) in the vicinity of the Cover from both ventilation system configurations will be less than the PM_{10} National Ambient Air Quality Standard (NAAQS) consistent with a key conclusion presented in the ROD Transportation Conformity analysis. Furthermore, ATC 65 will not have an impact on the Central 70 Project maximum impact location. Notably, ATC 65 results very small impacts to sensitive receptors located near the Swansea Elementary School irrespective of ventilation system configuration.

Using methodologies consistent with those used in the FEIS and ROD, this evaluation concludes that ATC 65 will not have an impact on the Central 70 Project maximum cumulative CO impact irrespective of ventilation configuration.

1.0 Proposed Design Changes

ATC 65 involves shifting the centerline of the I-70 Reference Design 46 feet to the north in the vicinity of the Cover. In order to do this, the north most lanes of I-70 will be shifted under 46th Avenue North which is a surface street. This has the effect of decreasing the width of the at-grade opening from which emissions are released from the lowered portion of I-70.

ATC 65 was configured with two different designs for venting Cover emissions, a longitudinal ventilation system and a transverse ventilation system. The longitudinal ventilation system is the same as that incorporated in the Reference Design. This configuration includes two sets of exhaust ventilation ducts (one over each set of lanes) suspended from the Cover running longitudinal to I-70. This design would exhaust emissions captured by the ventilation system above the westbound lanes at the west portal and above the eastbound lanes at the east portal. This design is shown in **Figure 1**. Additional information on this design can be found within the FEIS and ROD.

The transverse ventilation system routes air collected from beneath the Cover through ducts aligned transverse to I-70. This air is collected in a plenum running along the south side of I-70. Plenum air is exhausted at a single location from a vent on a structure just to the southeast of the east portal of the Cover between Clayton and Fillmore streets. **Figure 2** shows the locations of the longitudinal ventilation system east portal ventilation exhaust and the transverse ventilation system structure locations.

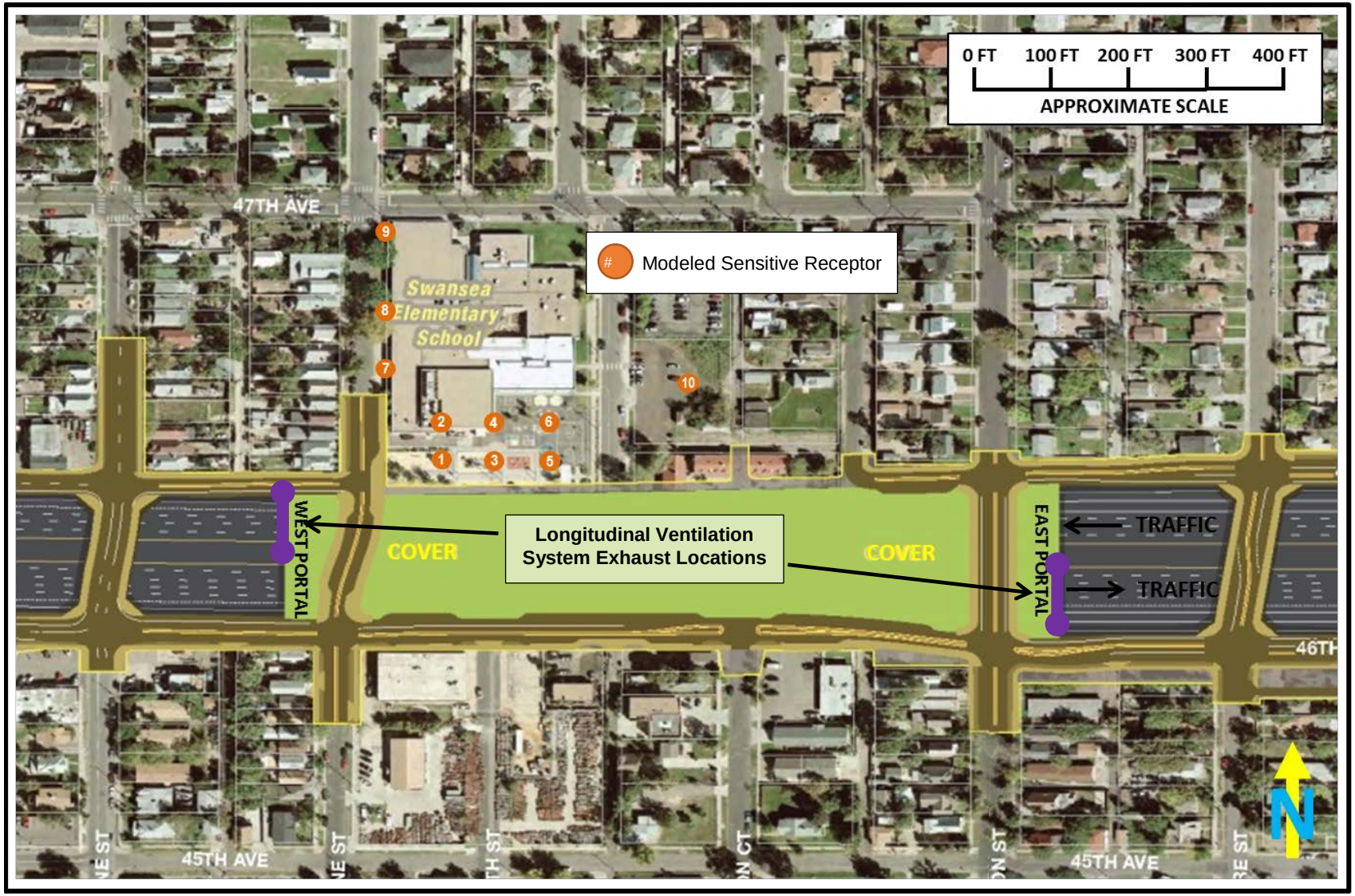


Figure 1 Layout of the Reference Design

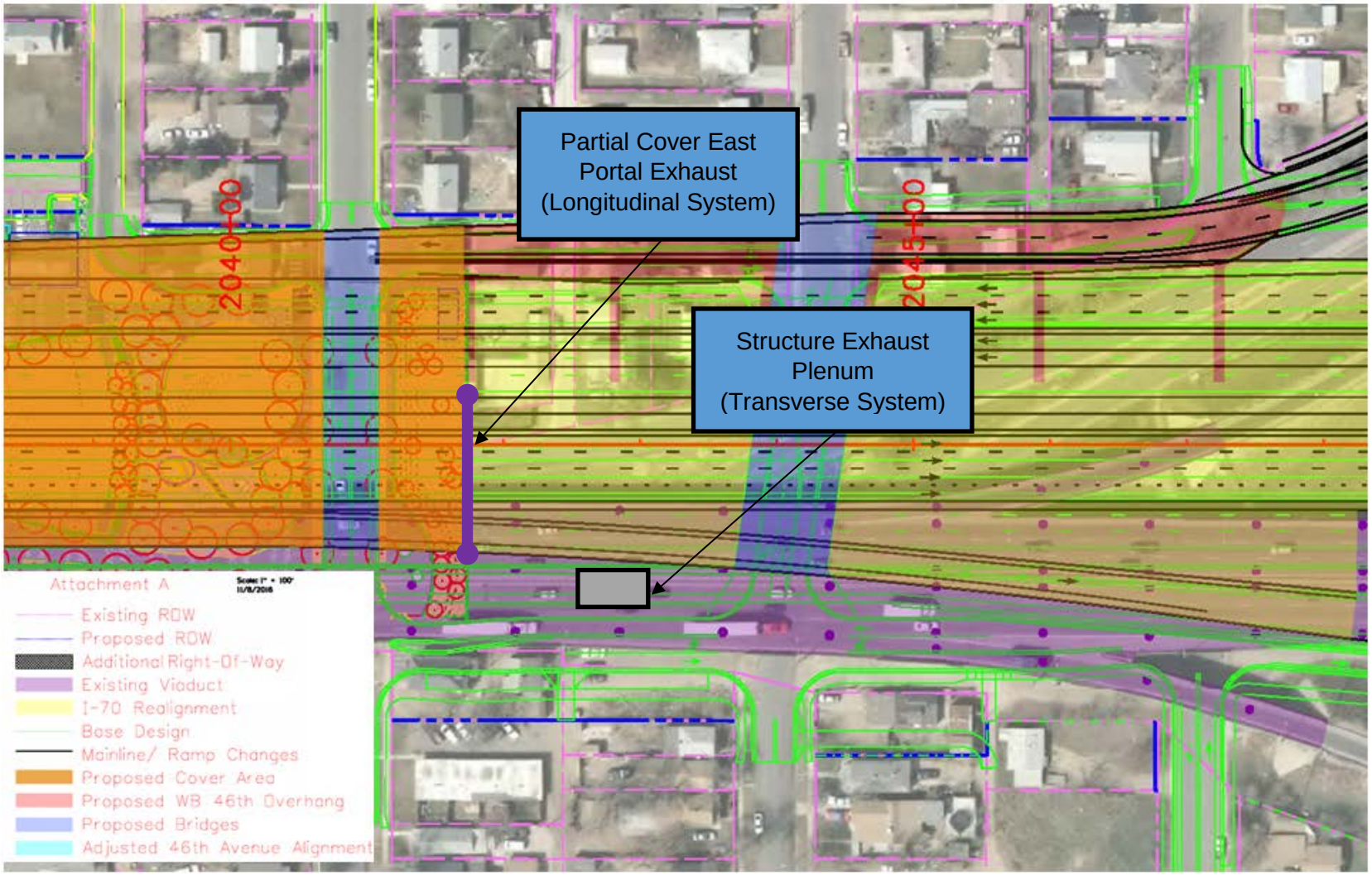


Figure 2 ATC 65 East Portal with Longitudinal and Transverse Ventilation System Exhaust Location Details

2.0 Evaluation of Air Quality Impacts

This analysis is limited to evaluating PM_{10} and CO impacts since this was the focus of the FEIS and ROD. The ROD Transportation Conformity analysis did not present impacts to specific receptors in the vicinity of the Cover. Furthermore, impacts on the Swansea Elementary School sensitive receptors were not specifically evaluated in the ROD.

The Transportation Conformity PM_{10} analysis demonstrated that impacts in the Swansea Area were below the PM_{10} NAAQS by showing that the maximum impact in the Swansea area, which was located near York St. and I-70, was below the NAAQS, and that this location is conservatively representative of all area locations. Therefore, numerical impacts in the immediate vicinity of the Cover did not need to be published to demonstrate compliance and were not available for comparison.

The Transportation Conformity CO analysis confirmed that the interchange at I-70 and Colorado Boulevard is expected to have the highest CO concentrations in the study area and that location is conservatively representative of all other project areas. Therefore, it was the only location used to demonstrate compliance with the CO NAAQS in the FEIS and ROD, and modeling was not conducted on receptors in the area surrounding the Cover.

The following discussion outlines the methods used to evaluate the air quality impacts from ATC 65 and the results of that evaluation.

2.1 Evaluation of CO Impacts

Using an approach similar to that used for the ROD, this evaluation of ATC 65 did not need to include a CO analysis using modeling to conclude that ATC 65 would not change conclusions described in the I-70 East FEIS or ROD. This is because changes to emissions sources that occur as a result of ATC 65 are too distant from the location of maximum CO impacts to significantly contribute to those impacts.

2.2 Evaluation of PM_{10} Impacts

The ATC 65 PM_{10} evaluation is based on the modeling input parameters used in the ROD Transportation Conformity analysis with only a few modifications to the modeled source locations. This included using the 2040 traffic projections. Emissions were not changed, and only the sources from which they were modeled were adjusted as needed. Under the ATC 65 design, several lanes of I-70 are shifting north in the vicinity of the Cover. Therefore, the location of the previously modeled I-70 open pit sources[1] (one at the eastern portal and one at the western portal) were shifted 46 feet (approximately 14 meters) to the north to reflect this aspect of ATC 65. In addition, the width of the open pit sources was narrowed to reflect the reduction in the width of the at-grade opening above the lowered portion of I-70. Though the width of the sources was reduced, the emissions were held constant.

Longitudinal ventilation system sources were modeled the same as they were for the Reference Design with two adjustments. First, the sources were shifted 46 feet north consistent with the I-70 alignment. Second, the width of the west portal ventilation sources were decreased given

[1] The AERMOD air quality dispersion model “Open Pit” source type was used to simulate emissions released below grade from vehicles descending into and out of the east and west portals of the Cover.

there is less space available for them when I-70 is slid underneath 46th Avenue North. Though the width of the west portal sources was decreased, the total emissions modeled from the east and west portal ventilation systems remained the same as the Reference Design.

To model the transverse ventilation system, the Reference Design ventilation sources were replaced with a single set of volume sources representing the transverse ventilation system plenum exhaust. This source was placed just south of I-70 at the proposed ventilation design structure location. All air pulled from under the Cover will be exhausted from the plenum exhaust structure; thus, the sum of the Reference Design east and west portal ventilation system emissions were modeled from the single ATC 65 plenum exhaust structure.

Consistent with the Reference Design modeling performed for the ROD, AERMOD v15121 was utilized for all modeling. Additionally, this evaluation used the same meteorology dataset for input to AERMOD. However, to simplify the modeling, impacts were assessed for all seasons instead of just winter months for this evaluation. The background concentration added to model-predicted impacts is consistent with the one found in the ROD which is higher than that used in the FEIS.

Two assessments were performed for both ventilation system designs which required two different receptor grids. The first assessment was performed utilizing the same receptor grid as that used in the ROD; however, the size was reduced to focus only on those receptors within 1 kilometer of the Cover. For informational purposes, a second assessment was performed to determine the impact to sensitive receptors near Swansea Elementary School. These sensitive receptor locations were identical to those modeled in the FEIS and shown in **Figure 1**.

Maximum model-predicted project-only 24-hour PM_{10} impacts near the Cover for ATC 65 are 37.2 µg/m^3 and 39.1 µg/m^3 for the longitudinal and transverse ventilation system configurations, respectively. Adding the approved background concentration and applying appropriate rounding the predicted cumulative impacts are in compliance with the PM_{10} NAAQS of 150 µg/m^3, and results are consistent with the key conclusion for PM_{10} presented in the ROD for this area.

Similar to the CO analysis, it should be noted that the changes to emissions sources that occur as a result of ATC 65 are too distant from the location of both the maximum PM_{10} impact in the Swansea area, which occurs at the York St. and I-70 intersection, and the maximum Central 70 Project impact, which occurs at the I-25 and I-70 intersection, to significantly contribute to those impacts.

For information, **Table 1** and **Table 2** summarize the cumulative model-predicted 24-hour PM_{10} impacts at sensitive receptors near Swansea Elementary School. These tables shows that predicted impacts around the school are well below the PM_{10} NAAQS and ATC 65 configured with a transverse ventilation system produces the lowest impacts as a result of the exhaust vent being much further from the school than any other design evaluated. Generally, impacts at the Swansea Elementary School receptors are not sensitive to the ATC 65 alignment change given that Cover emissions are collected and released some distance from the receptors.

3.0 Conclusions

ATC 65 does not change conclusions found in the ROD with regard to CO impacts given the distance to maximum CO impacts. Consistent with the key conclusion of the ROD Transportation Conformity analysis, predicted ATC 65 PM_{10} impacts are below the NAAQS and ATC 65 will not have an effect of the maximum Central 70 Project impact.

Table 1 – ATC 65 PM_{10} Sensitive Receptor Analysis – Longitudinal Ventilation System

No.	Description	Predicted Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Concentration[a,b] ($\mu g/m^3$)
1	Playground Southwest	6.38	113	119
2	School Building Southwest Corner	6.10	113	119
3	Playground South	6.09	113	119
4	School Building South Edge	5.29	113	118
5	Playground Southeast	5.69	113	119
6	Playground Northeast	5.00	113	118
7	Columbine St. - School Bus Loading Zone	6.15	113	119
8	Columbine St. between 46th Ave and 47th Ave	5.79	113	119
9	Columbine St and 47th Ave	5.51	113	119
10	Elizabeth St between 46th Ave and 47th Ave - unpaved parking lot across from school	5.10	113	118

[a] Total Concentration includes the model predicted concentration + background.

[b] Note that the 24-hour PM_{10} National Ambient Air Quality Standard is 150 $\mu g/m^3$.

Table 2 – ATC 65 PM_{10} Sensitive Receptor Analysis – Transverse Ventilation System

No.	Description	Predicted Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Concentration[a,b] ($\mu g/m^3$)
1	Playground Southwest	5.06	113	118
2	School Building Southwest Corner	4.94	113	118
3	Playground South	5.06	113	118
4	School Building South Edge	4.69	113	118
5	Playground Southeast	4.79	113	118
6	Playground Northeast	4.68	113	118
7	Columbine St. - School Bus Loading Zone	4.97	113	118
8	Columbine St. between 46th Ave and 47th Ave	4.50	113	118
9	Columbine St and 47th Ave	4.33	113	117
10	Elizabeth St between 46th Ave and 47th Ave - unpaved parking lot across from school	5.57	113	119

[a] Total Concentration includes the model predicted concentration + background.

[b] Note that the 24-hour PM_{10} National Ambient Air Quality Standard is 150 $\mu g/m^3$.

Noise Impact Evaluation of ATC 65

For

Central 70 Project

March 24, 2017

Prepared By:

Front Range Mobility Group

ANALYSIS OF ATC 65 NOISE IMPACTS

The purpose of this document is to explore how Alternative Technical Concept (ATC) 65 will alter noise analyses conclusions found in the I-70 East Final Environmental Impact Statement (FEIS) published in January 2016 and the associated Record of Decision (ROD) published in January 2017.

This assessment relies on the previous noise modeling conducted for the FEIS, and concludes that the proposed changes included in ATC 65 do not change the general noise impact conclusions reported in the I-70 FEIS Reference Design for the surrounding community. Due to the configuration of ATC 65 with 46th Avenue North overhanging the I-70 mainline, the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) developed for the Reference Design as part of the FEIS could not be successfully modified to predict valid noise levels at modeled receptor locations. Therefore, a more capable noise modeling software package, Cadna/A® Noise Prediction Model Version 2017 (Cadna/A), was utilized to evaluate the relative changes in noise levels. Cadna/A has the capacity to model the specific three-dimensional modeling complexities of ATC 65.

1.0 Proposed Design Changes

ATC 65 modifies the Reference Design in the area of the covered portion of I-70. ATC 65 includes moving I-70 approximately 46 feet to the north placing the northernmost lanes of westbound traffic beneath 46th Avenue North east and west of the Cover between Vasquez Boulevard and York Street. This update will benefit the design by:

- Moving the roadway without affecting the 46th Avenue North alignment.
- Allowing the current I-70 viaduct to remain operational during the majority of construction.
- Shortening the total construction duration.
- Allowing safer conditions during construction.

The alternate design would include an overhanging roadway system using girders above several of the west bound I-70 lanes in the vicinity of the east and west Cover portals. In the Reference Design, I-70 is exposed in its entirety with the exception of the Cover. With the new design, two lanes, which are on/off ramps, will move beneath this overhang.

2.0 Evaluation of Noise Impacts

As part of the FEIS, noise sensitive receptors were identified and existing and future noise conditions were predicted with modeling. Existing conditions indicate that many modeled receptors identified within the study area experience noise levels ranging from 57 dBA to 71 dBA.

Predictive noise modeling conducted in support of the FEIS for the Reference Design resulted in approximately 17 percent of the modeled receptors experiencing levels exceeding CDOT Noise Abatement Criteria (NAC) thresholds, with noise levels ranging from 52 dBA to 74 dBA.

With ATC 65 moving I-70 further north, sensitive receptors located on the south side of I-70 will experience a decrease in noise because of the increased attenuation distance. Receivers that are most susceptible to noise level increases from the proposed 46 foot northward shift of I-70 are located on the north side of the study area. On this side, sensitive receptors will experience noise levels generally similar to those predicted in the FEIS noise study, with some receptors experiencing inconsequential increases and decreases due to changing ramp alignments and small line of-sight adjustments. In the vicinity of the Cover, it was determined that relocating traffic lanes beneath 46th Avenue North would in fact generally result in receivers experiencing a decrease in noise levels by reducing the line-of-sight from first row receivers to traffic noise sources of central and southern lanes that, under ATC 65, will now be occluded by the 46th Avenue North roadway overhang. Receivers located in the second and third rows of homes on the north side of I-70 are not affected by this occlusion due to their lack of line of sight to the I-70 roadway in either design option. However, because several lanes are under 46th Avenue North, ATC 65 will essentially result in fewer lanes emitting noise directly to receptors. As a result, if second and third row receptors experience any change it will be inconsequential decreases of less than 1 dBA. Despite these fluctuations in predicted levels, impact determinations in the FEIS for the Reference Design are anticipated to remain unchanged.

Cadna/A noise modeling software was used to accurately predict and illustrate noise propagation differences between the FEIS Reference Design and the proposed ATC 65 design, as shown in the side-by-side cut graphic in **Figure 1**. This graphic illustrates the acoustic shielding effect afforded by the structure mounted 46th Avenue North on traffic noise emanating from lanes being located immediately beneath it. Colored noise contour areas, illustrating 5 dBA steps in noise level, demonstrate the predicted reduction in propagation toward receptors located on the northern side of I-70.

3.0 Other Design Mitigation Considered

Analyses conducted for the Reference Design and documented in the FEIS and ROD for the area near the Cover showed that noise barriers on the north and south side of I-70 were not necessary in this vicinity according to FHWA criteria. Due to the small differences in impacts expected between the Reference Design and ATC 65, the noise abatement conclusions in this area are not likely to change as a result of ATC 65. Regardless, a noise analysis that complies with CDOT Noise Analysis and Abatement Guidelines[1] will be conducted for ATC 65 if it is accepted as part of the final design. That analysis will document if any neighborhoods have become eligible for noise abatement due to ATC 65 and include recommended noise abatement if necessary.

4.0 Conclusions

In order to change the conclusions in the I-70 FEIS Reference Design, the ATC 65 design would have to increase noise levels above CDOT NAC thresholds or cause a substantial increase at previously non impacted receptors. As a result of this evaluation, it has been determined that predicted levels from ATC 65 will not introduce additional noise impacts to this study area.

[1] CDOT Noise Analysis and Abatement Guidelines, January 2015. https://www.codot.gov/programs/environmental/noise/guidelines-policies/copy_of_cdot-noise-guidance/at_download/file

It is expected that there would be no perceptible change in noise levels at noise sensitive receptor locations due to the ATC 65 design relative to levels predicted for the FEIS Reference Design. Additionally, ATC 65 could potentially lower noise levels for many first-row noise sensitive receptors including receptors that were predicted to be impacted in the previous FEIS analysis. Based on this analysis, ATC 65 has no negative impact on noise for the Central 70 project.

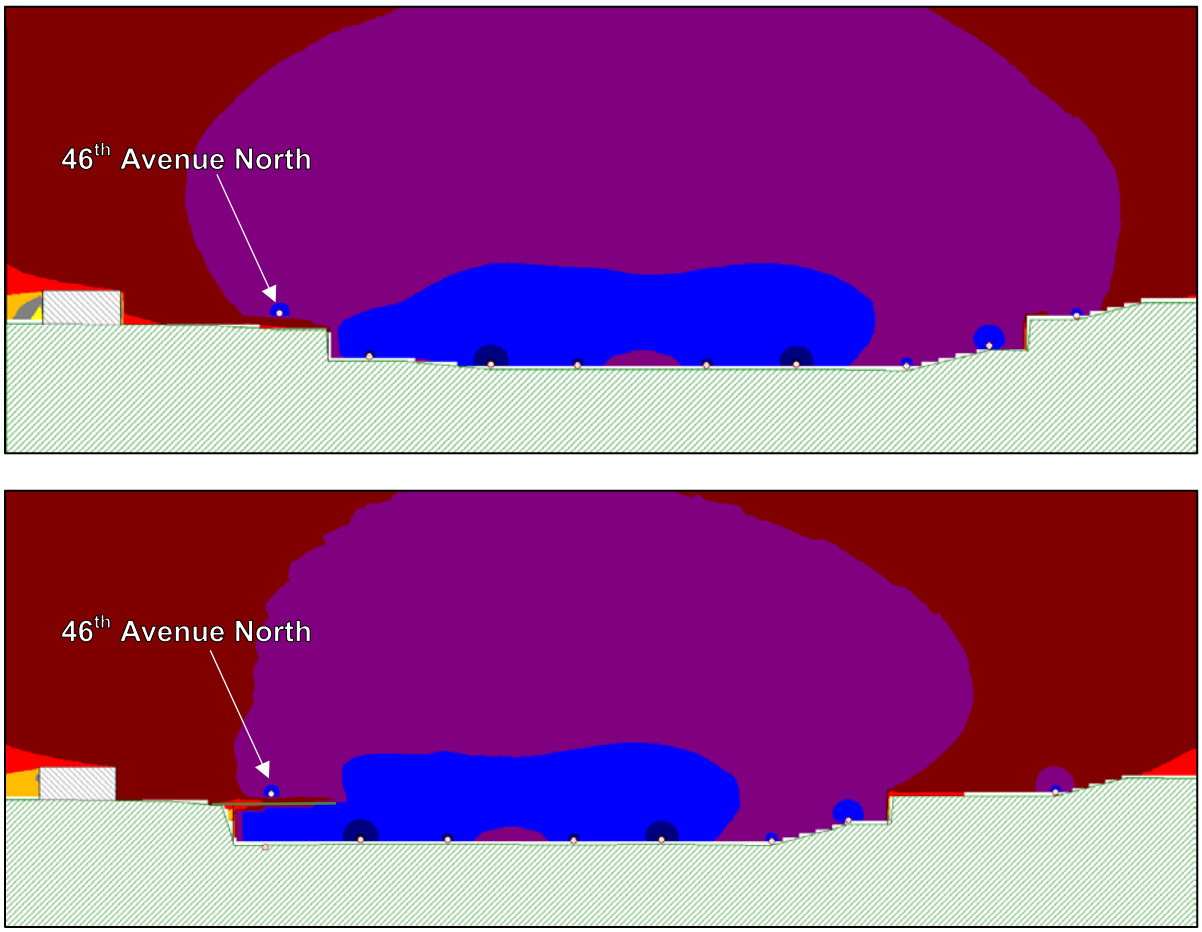


Figure 1 **Cross-section of noise propagation contours for the Reference Design (top) and ATC 65 (bottom) Cadna/A models between Milwaukee and Fillmore looking east**

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Tampa, Florida 33607-1482 813 760 1250 cell
www.aecom.com

Memorandum

To	Front Range Mobility Group	Page	1/2
CC	Chris Bisio, K.N.Gunalan,		
Subject	Central 70 Project: FRMG ATC 65		
From	Martin (Marty) A. Peate, ACIP NEPA/ Corridors Lead		
Date	March 23, 2017	Project Number	60445942

Based on my 24 years of experience with similar complex NEPA projects in similar urban surroundings, it is my expert opinion that a Level II Reevaluation will be required associated with ATC 65. In any case, I would suggest that we provide the following response to the Procuring Authorities for the information requested in re-submission of this ATC.

Requested Information: The Procuring Authorities believe that not enough information has been provided at this time to conclude with certainty that the ATC will require a Level II Reevaluation. If the ATC were to require a Level IV Reevaluation, please outline the process that FRMG will follow to manage the additional risks and possible schedule implications of the more robust reevaluation.

Response: FRMG understands the Procuring Authorities reservations to an early conclusion on the level of re-evaluation that will be required. We have performed a thorough due diligence of the potential impacts, risks and conceptual mitigation strategies related to the design changes proposed in ATC 65 and are confident that a Level II Reevaluation is most likely. However, the following is an outline of FRMG's process to manage any additional risks and possible schedule implication if a more robust reevaluation (i.e. Level IV) is required.

- Immediately upon execution of the Project Agreement, FRMG will meet CDOT, FHWA, and any appropriate representatives of the Environmental Programs Branch (EPB) to thoroughly discuss and define the action being re-evaluated. This meeting will be a working meeting establishing the scope of effort needed to satisfy the data needs of the reviewing parties and comparative reevaluation criteria necessary to reach approval.
- FRMG suggests a collaborative development process whereas FRMG and the reviewing parties will work collaboratively in the development and review of the reevaluation allowing for real-time resolution of comments, concerns and questions.
- Within 10 days of the reaching agreement with the reviewing parties, FRMG will initiate a focused local agency/stakeholder outreach effort including informational notifications and strategic meetings. This effort will be focused on those affected by the design change. Feedback from this outreach will provide FRMG with guidance on the level of community acceptance/resistance to anticipate.
- By the 5th month after execution of the Project Agreement, FRMG, in coordination with CDOT, FHWA and EPB, will initiate a focused public outreach effort using direct mailing to property owners adjacent to and within an agreed upon distance from the design change(s). This notification will include a graphic representation of the design change(s) and a comparative matrix of impacts/benefits.

- FRMG will establish an interim milestone date associated with the results and feedback from this outreach. This milestone will determine if moving forward with the design change(s) and re-evaluation will have a positive or negative impact on the overall production delivery schedule.
- After public input has been received it will be incorporated into the reevaluation and reviewed with CDOT, FHWA, and EPB. At this point it will be determined if further public input is needed or if the reevaluation can be finalized and submitted for approval.
- Using this strategy, FRMG anticipates an additional 45 to 60 days would be required for the completion of Level IV Reevaluation. FRMG will use this more robust reevaluation timeframe in establishing the interim milestone discussed above.

FRMG anticipates that the following changes (adverse and beneficial) to Environmental Impacts and potential additional study if needed:

- **Air Quality** - as requested by CDOT, our Air Quality Analysis modeling effort used the parameters from the ROD and 2040 traffic projections to compare potential impacts to Air Quality. The results of this modeling effort demonstrate comparable air quality between ATC 65 and the Reference Design in the FEIS and ROD. The results of this effort will be directly applicable to the reevaluation assessment and documentation.
- **Environmental Justice** – no adverse impacts related to Environmental Justice populations are anticipated but these populations will experience a net benefit through the creation of a linear open space area between York Street and Jackson Street. As per the commitments in the ROD FRMG will utilize the existing structure and format establish in the Swansea and Elyria Neighborhood Plans for community input and engagement. This net benefit can be used as a mitigation action for other impacts if necessary.
- **Residential/Business right-of-way impacts** – Lots 17 and 32 of Parcel RW-63 are partially acquired as part of the Reference Design with no adverse impact to Swansea Elementary. ATC 65 will require approximately an additional 3,000 square feet of ROW from these Lots. FRMG will coordinate with the City and County of Denver and Denver Public Schools to evaluate potential impacts that may occur; however, no adverse impacts are anticipated from the additional ROW at Swansea Elementary School.
- **Noise** – as requested by CDOT in response to this ATC, our noise analysis compared potential impacts to noise receptors where the I-70 alignment would be shifted to the north. FRMG assumes that the results of this modeling effort will demonstrate negligible difference between ATC 65 and the Reference Design. The results of this effort will be directly applicable to the reevaluation assessment and documentation.
- **Visual Resources/Aesthetics** – ATC 65 is anticipated to yield additional benefits to visual resources and aesthetics though the creation of new linear open space along the southern edge of the I-70 corridor. Potential aesthetic treatments and commitments will be coordinated with the Swansea and Elyria neighborhoods using the existing structure and format establish in the Swansea and Elyria Neighborhood Plans for community input and engagement. This net benefit can be used as mitigation action for other impacts if necessary.
- **Public Engagement** – FRMG proposes to use a targeted engagement strategy with those property owners and interested parties directly adjacent to ATC 65. This targeted engagement strategy would include a detailed project “newsletter” reviewing the differences between ATC 65 and the Partial Cover Lowered Alternative as approved in the ROD as a direct mail-out. As necessary, FRMG will engage the community via established means and existing organization meetings, such as Swansea Elementary PTSA meetings and Swansea/Elyria Community meetings.

Central 70

DATE: March 17, 2017

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Initial Detailed Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 65.1

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 65.1 has been preliminarily reviewed by the Procuring Authorities. The ATC proposes to shift I-70 north between Brighton Boulevard and Colorado Boulevard.

In accordance with Section 3.3.2 of Part C of the Instructions to Proposers ("ITP"), the Procuring Authorities are providing the following preliminary written feedback on the above ATC Submission prior to the One-on-One Meeting at which such submission will be discussed:

☐ 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 Procuring Authorities have reviewed the Detailed ATC Submission and have arrived at the above preliminary evaluation as identified with the check mark. The Procuring Authorities are working diligently to review the proposed ATC. In an effort to expedite the ATC process, the Procuring Authorities would like to provide the following feedback and request that these items are addressed in the Detailed ATC re-submission:

1. The design submitted in the ATC does not reflect the final RFP contract requirements. Please update the ATC to show the final RFP requirements. This shall include, but not be limited to the revised lane configurations, the sidewalk widths, the access locations, and the accommodation of the DPS Phase 3 School layout.
2. Note that the full Air Quality Analysis modeling referenced in your response needs to be based on the modeling input parameters used in the Record of Decision, including the 2040 traffic projects. Also, please provide an update on the schedule for delivering the full air and noise analyses.

3. The Procuring Authorities believe that not enough information has been provided at this time to conclude with certainty that the ATC will require a Level II Reevaluation. If the ATC were to require a Level IV Reevaluation, please outline the process that FRMG will follow to manage the additional risks and possible schedule implications of the more robust reevaluation.
4. The additional ROW that is identified in the ATC submission does not account for the soil nails that are shown in the cross sections. If soil nails are used, additional ROW will be required to encompass the extent of the nail. Please clarify if additional ROW will be required.
5. If this ATC is implemented, the Procuring Authorities believe it will be necessary to shift ownership and maintenance responsibility of the portions of 46th Avenue overhanging I-70 from the City of Denver to the State, which will in turn add those segments of 46th Avenue to the Developer's O&M responsibility. The Handback Requirements in Schedule 12 will apply to the additional structures. In your resubmittal please confirm if this is consistent with FRMG's understanding, and if not, describe the cost implications of adding the associated O&M Work and Renewal Work to the Developer's scope.

The Procuring Authorities continue to reserve the right to modify the above preliminary evaluation and/or discuss the Detailed ATC with FHWA and the City of Denver, if necessary.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: March 1, 2017

Central 70 Project RFP: ATC Submission No. 65.1[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☒ Previously Submitted as Conceptual ATC

☐ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

In a letter dated December 16, 2016, the Procuring Authorities requested that FRMG address the following items in the Detailed ATC submission. FRMG's response to these items is included in Section B.9 of this ATC.

1. Please provide additional information regarding the accommodation of utilities.

2. Please provide additional information regarding the overall highway footprint. Does the footprint change in size?

3. Please provide additional information on the alignment of 46th Avenue South. How much additional space would be created on the south side of the project because of the shift?

4. Please provide additional information regarding any due diligence that Front Range Mobility Group has performed to determine if additional air quality or noise impacts are created by the shift.

5. Please provide an analysis of any traffic impacts or benefits that are created by the shift.

6. Please provide additional information regarding the bookend modifications for 46th on the northeast and northwest corners of the Cover.

7. Please provide additional information on the impact this ATC would have to the Swansea Elementary School layout during construction.

8. Please provide an analysis of the impacts to UPRR structure and trackwork plans if this ATC is implemented.

In addition, the Procuring Authorities requested the following in addition to the above on February 10, 2017. FRMG's response to these items is included in Section B.9 of this ATC.

[1] Proposers to complete in accordance with instruction (2) to the Annex.

9. There is concern about the operational impacts of moving the Steele Street ramps closer to 45th Avenue. It is highly undesirable to operate the 45th Avenue and Steele Street signals as a single signal. Please address options to minimize or eliminate the relocation of the Steele Street ramps.

10. Please indicate any impacts to the southwest and southeast quadrants of the Steele/Vasquez interchange if the ATC is implemented.

11. Please provide additional details to demonstrate that implementation of this ATC does not preclude the second cover (see Paragraph 1.17a of Section 1 of Schedule 10).

12. The presentation on January 24th provided a plan view plot with a vision for a greenway with sidewalks, trees, etc. Please clearly indicate which of the depicted elements would be included as a part of implementation of this ATC and constructed by FRMG at FRMG's cost.

13. Please outline the process that FRMG would follow regarding getting community input and gaining consensus for the use and features of the additional area on the south side of I-70 that is created if this ATC is implemented.

14. Please outline the process that FRMG would follow regarding additional environmental evaluations that will be required if this ATC is implemented. Also, provide a description of any challenges you foresee, any mitigation strategy FRMG would undertake if necessary, and strategies for implementing a Base Design if, despite best efforts, FRMG is not able to obtain any required approvals.

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

This ATC will:

- Reduce the Project Schedule by 6 to 8 months
- Allow opening of WB Tolled Express Lane 12 months earlier
- Reduce construction duration at Swansea School by 12 months
- Provide aesthetic/mobility enhancement to Neighborhoods
- Maximize Efficiency and Quality throughout the Project Lifecycle

The Central 70 Project is essential to improving mobility along I-70 and reconnecting neighborhoods in the surrounding community. However, the construction of this project means unavoidable impacts to the day-to-day lives of those who depend on I-70 for transportation needs and who live and work adjacent to the project corridor. To address these concerns, FRMG is proposing an ATC to realign I-70 between Brighton Boulevard and Colorado Boulevard, shifting it north approximately 45 feet as compared to the Reference Design. In moving I-70 to the north, a small portion of 46th Avenue North will overhang I-70 WB lanes supported by straddle bents across the WB roadway.

The ATC allows for nearly full construction of the trench portion of I-70 while maintaining traffic on the existing viaduct. This results in reduced impacts on the community and public, as well as faster, less-segmented construction phasing.

As the Elyria and Swansea Neighborhoods are critical community elements and central to the success of the Central 70 Project, FRMG appreciates the significant, long-term efforts that have gone into advancing the environmental review process and the IGA with the City and County of Denver. We view the following ATC as precisely aligned with these efforts and with the goals for the Project. This ATC will accelerate benefits for stakeholders including the traveling public, and particularly the local community. In response to the Procuring Authorities' comments at the One-on-One meetings, this ATC preserves all connectivity and access from the Reference Design, and includes only one minor subsurface ROW acquisition, measuring approximately 12 feet by 265 feet at the Swansea Elementary School, to accommodate I-70 below grade in the tunnel portion of the Lowered Section, with no impact or loss of function on the surface.

FRMG strongly believes this ATC will minimize impacts to the community both during and after construction, minimize impacts to the traveling public during construction, and maximize efficiency and quality throughout the project lifecycle. This ATC has been drafted with collaborative input from designers, constructors, O&M and NEPA experts who considered the cost and benefits from the perspectives of responsiveness to the community as well as responsible stewardship of taxpayer dollars. Preliminary, verbal input from the Procuring Authorities has been incorporated as well.

The following is an overview of the proposed ATC elements:

Project Commitments	Maintenance of Traffic	Design & Construction
▪ Maintaining the cover structure and park and associated elements as shown in the Reference Design. ▪ Maintaining all connectivity and local access as in the Reference Design.	▪ Greatly simplified maintenance of traffic scheme that keeps traffic on the existing viaduct while the trench section is being constructed, resulting in less impact from construction and safer passage through the construction zone. ▪ Allows for greater capacity of 46th Avenue during construction due to greater separation from the excavation activities along the Lowered Section.	▪ Nearly full construction of the Lowered Section in a single phase, reducing "overlap" with the existing viaduct structure. ▪ Allowing the construction of bridges crossing I-70 in a single phase at Vasquez, Josephine, Columbine, and Clayton Streets. ▪ Simplifying construction of bridges crossing I-70 at York, Monroe, Fillmore, and Cook Streets through reduced conflicts with viaduct columns. ▪ Overhanging a small portion of 46th Avenue North over the WB lanes of I-70 on either side of the cover structure.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate the proposed ATC[3].

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

- Schedule 10, Section 9.4.2.c.ii.A: "The Steele Street/Vasquez Boulevard westbound entrance ramp shall provide a minimum of 750 feet dual ramp meter queuing as measured from the ramp meter stop bar to the cross street."

  This ATC provides approximately 600 feet dual ramp meter queuing.

- Schedule 10, Section 9, Appendix A Roadway Design Criteria: "Shoulder width requirement for Vasquez Boulevard WB Entrance Ramp is 8 feet."

  This ATC provides an 8-foot outside shoulder width for the first 300 feet of the Steele WB Entrance Ramp, and the remaining 1300 feet of the ramp has a 6-foot outside shoulder.

- Schedule 10, Section 9, Appendix A Roadway Design Criteria. "Steele Street EB Exit Ramp shall have a maximum grade of 5%."

  In order to construct the majority of the tunnel in one phase while the existing viaduct remains in place and maintain the Steele Street EB exit ramp terminal in the location shown in the Reference Design, the grade on the Steele Street EB exit ramp is 6%.

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

As stated in the ATC overview, FRMG seeks to further build on the Procuring Authorities' environmental process and the IGA with the City and County of Denver to achieve the goals of the project. This ATC will lead to earlier realization of the benefits of this project for the local community and the traveling public. To re-emphasize our rationale for this ATC, the realignment of I-70 between Brighton Boulevard and Colorado Boulevard to the north will result in the following benefits for key stakeholders:

Table ATC-1.

	Direct Benefits for:		
	CDOT	Elyria and Swansea Community	Traveling Public
Overall ATC Results:	*Maximized efficiency and quality throughout the project lifecycle*	*Minimized impacts to the community both during and after construction*	*Minimized impacts to the traveling public during construction*
ATC Proposal Elements			
Nearly full construction of the Lowered Section in a single phase by realigning I-70 to the north of the Reference Design	▪ Faster, less-segmented construction phasing reducing the project schedule by 6 to 8 months ▪ Potential Earlier opening of the WB Tolled Express Lane ▪ Reduced costs through shortened schedule ▪ Construction of the Vasquez, Josephine, Columbine, and Clayton structures in a single phase ▪ Simplified phasing of the York, Cook, Fillmore, and Monroe structures ▪ Streamlined efficiency with fewer interfaces during construction (less coordination required for vendors/subs) ▪ Increased consistency, continuity, and quality in un-interrupted delivery ▪ Improved Safety	▪ Reduced community impacts from construction, including traffic disruption, dust and equipment air emissions, noise, and general inconvenience ▪ Reduced pressure on local roads and detour routes ▪ Improved Safety ▪ Shorter duration to endure construction including at Swansea Elementary School where construction adjacent to the school will be 12 months shorter ▪ Additional landscape, sidewalks, paths, and urban design amenities to enhance the corridor and the neighborhoods in the project vicinity.	▪ Improved Safety ▪ Simplified traffic control ▪ Fewer lane shifts and traffic pattern changes ▪ Allows for greater capacity on 46th Avenue during construction due to greater separation from the excavation in the Lowered Section. ▪ Reduced travel time with minimized lane closures and detours

Alignment with the Project Goals:

This ATC clearly aligns with the Procuring Authorities' project goals and as outlined in the following table and provides the Procuring Authorities with an option to realize these goals faster. While FRMG understands the challenges that the Project creates along the I-70 Corridor, including the impacts to the Elyria and Swansea Neighborhoods, this ATC supports all existing goals and provides an option to accelerate and ease the impacts of construction, benefiting all impacted parties as shown in Table ATC-2 below.

Table ATC-2.

This ATC is aligned with Project Goals and is proposed to accelerate construction through full construction of the depressed trench section while maintaining traffic on the existing viaduct.

Project Goals	Alignment (Y or N)	ATC Key Benefits in Alignment with Goals
1. Optimize the scope of the transportation and supporting infrastructure delivered through the Project in order to promote corridor-wide economic and community vitality.	☑ Yes	▪ Meets the needs of the neighborhood with the best use of taxpayer dollars ▪ This ATC promotes corridor-wide economic and community vitality
2. Optimize operating and life cycle maintenance costs by delivering a Project using quality design, materials and techniques.	☑ Yes	▪ Increases consistency and quality in single-phase delivery, thereby minimizing future rehabilitation needs and resulting disruption to traffic. ▪ Maximizes efficiency in project approach (streamlined coordination)
3. Minimize impacts to the traveling public, businesses and nearby communities during and after construction.	☑ Yes	▪ Reduces impact by maintaining existing lanes and speeds ▪ Reduces pressure on local roads and detour routes ▪ Less rerouting means less negative impact to local business
4. Once operational, ensure reliable travel speeds in the managed lanes and, for all lanes, a minimum appropriate standard of maintenance.	☑ Yes	▪ Reliable travel speeds will be obtained in the managed lanes and maintenance requirements met for all lanes
5. Utilize a collaborative process to enhance community values and Project benefits.	☑ Yes	▪ ATC drafted from collaborative input from designers, constructors, and NEPA experts ▪ Together, considered both environmental and community issues and responsible stewardship of taxpayer dollars ▪ A collaborative approach will be used with the Procuring Authorities for implementation of this ATC.
6. Protect the safety of the workforce and public.	☑ Yes	▪ Increases safety of workforce in physical construction separation from ongoing traffic ▪ Increases safety of public with fewer lane shifts and maintaining existing traffic pattern longer

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

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

The following Table ATC-3 provides a preliminary impact analysis associated with implementation of this ATC. The analysis takes into consideration the potential change in impacts when compared to the impact conclusions in the FEIS for the Reference Design. The analysis also shows that this ATC is not expected to have negative environmental effects, and in fact, that it will have beneficial or similar environmental and social/economic impact to the Reference Design. FRMG has performed due diligence to address both air quality and noise impacts as requested by the Procuring Authorities and has determined that there are no negative impacts. This is further discussed in Section B.9, Additional Information.

This ATC will result in a significant reduction in construction duration (an estimated reduction of 6 to 8 months). Impacts that are linked to the duration of construction, such as traffic disruption, construction noise and air quality particulate emissions would be reduced generating beneficial effects.

This ATC will require a small strip of additional ROW measuring approximately 12 feet by 265 feet (Lots 17 and 32 of Parcel RW-63) for subsurface use (Lowered Section of I-70) at the Swansea Elementary School where I-70 will be shifted to the north in its Lowered Section location. There will be no loss of function or impact to the school.

Table ATC-3.

EIS Categories not expected to be impacted or result in Positive impacts by this ATC

Environmental Category	Explanation
Social and Economic Conditions	The reduction in construction duration would have a corresponding positive effect on temporary road closures and traffic detours, as well as reducing impacts associated with access to businesses and public services. Impacts to Swansea Elementary School will also be reduced based on shorter construction duration adjacent to the school.
Visual resources & aesthetic qualities	No negative visual effects are expected as a result of implementing this ATC. The project will be designed in accordance with the Aesthetic Design Guidelines established for the project.
Parks and recreational resources	Recreational opportunities are improved through enhanced bike and pedestrian facilities and connectivity (sidewalks and paths) along the corridor.
Air Quality	Preliminary CO and PM air quality analysis supporting this ATC show that impacts will be below the NAAQS standard and below or equivalent to impacts disclosed in the FEIS. Based on the construction schedule being reduced with this ATC, construction generated air pollutant emissions would be significantly reduced. Therefore, no adverse air quality effects are expected as a result of implementing this ATC.
Energy	Significant energy consumption differences are not expected as a result of this ATC. A shorter construction schedule will reduce overall energy consumption.
Noise	Preliminary noise emission modeling supporting this ATC shows negligible changes in noise levels at sensitive receptors. Based on the construction schedule being reduced as a result of the ATC, the duration of construction generated noise impacts would be significantly reduced. Adverse noise effects are not be expected by implementing this ATC.
Section 4(f) and Section 6(f)-Recreation Resources	No additional effects on Section 4(f) or 6(f) resources are expected. No net change in available parkland would result from this ATC.
Traffic	This ATC will lead to simplified traffic control during construction with fewer lane shifts and traffic pattern changes. This will result in reduced travel time with reduced lane closures and minimized detours. Improved safety is expected since construction will be separated from the existing highway for a longer duration.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

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

FRMG anticipates net savings of $30M to the Base MPP over the term of the Project associated with the components of this ATC due to efficiencies achieved through streamlined schedule and ability to construct the majority of the Lowered Section in a single phase.

In addition to the direct cost benefits and savings, there are many intangible benefits to the community and travelling public with a shortened construction schedule, and safer construction phasing and maintenance of traffic. Ultimately this ATC would benefit those living and commuting in the Elyria and Swansea Neighborhoods as well as the Greater Denver Area.

The breakdown of savings is offset by additional costs as follows:

Cost Savings Items -- $43.55M Base MPP over the term of the Project

- Reduced schedule and associated Project Management -- $14,000,000
- Demolition -- $1,050,000
- Excavation and Dewatering -- $3,500,000
- Support of Excavation -- $6,000,000
- Roadway and Structures elements -- $4,500,000
- Maintenance of Traffic -- $3,500,000
- Cover Structure, Temporary Electrical, Lighting, ITS and Mechanical -- $11,000,000

Added Cost Items – ($13.55M) Base MPP over the term of the Project

- Support of existing viaduct during trench construction – ($1,875,000)
- Additional Structures (46th Avenue North overhang and bridge widening for wider paths/sidewalks) – ($9,000,000)
- Utility Accommodation (including storm sewer) – ($450,000)
- Landscaping and Aesthetic Enhancements – ($2,225,000). FRMG has included this allowance to incorporate landscape and aesthetic enhancements in the available space created with this ATC on the south side of I-70 and nearby areas to improve pedestrian connectivity and aesthetic consistency. See Attachment M for a concept layout of potential enhancements that has been refined through discussions with the Procuring Authorities at One-on-One meetings. Components included in the concepts are:
    - 35,500 SF of additional sidewalk (including 3,600 SF of bridge widening for 8-foot paths with 2-foot buffer width on bridges at 6 locations and 31,900 SF of at-grade new and widened paths
    - 149,700 SF additional Irrigated Landscaping (including 47,540 SF in the additional space created by ATC 65, and 102,160 SF in nearby areas)
    - 175 additional trees

In lieu of these components, FRMG is open to incorporating recommendations by the Procuring Authorities for included amenities within the Base MPP over the term of the Project allowance of $2.225M.

This ATC would provide availability for opening of the WB Tolled Express Lane approximately 12 months earlier, which could generate revenue for HPTE.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

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

A detailed schedule analysis shows the benefits and positive impacts of this ATC on the schedule. This ATC will result in fewer phases of construction, consistent delivery, and streamlined efforts. A preliminary assessment based on this ATC and the ability to accelerate and combine construction phases indicates an overall schedule savings of **6 to 8 months** off the project's critical path schedule.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

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

Several exhibits are attached to this document to illustrate the aspects of this ATC.

Attachment A shows the layout of the project with ATC 65 incorporated. The Cover section and cross-street bridges are shown in purple, the portion of 46th Avenue that would be constructed over I-70, supported by straddle bents at key locations is shown in red, and the available space on the south side of I-70 in yellow. It should be noted that adjacent to the bridge crossings of I-70, the straddle bents will be incorporated into the bridge crossings for an integrated appearance with the bridges.

Attachment B shows typical sections through the cover at the Swansea Elementary School in FRMG's Base Design, and with ATC 65. In these typical sections, it can be seen that the Cover remains in exactly the same location with or without ATC 65. I-70 simply moves to the north under the Cover. Attachment C shows typical sections at the west portal of the tunnel with or without ATC 65. These sections also show the available space that is created on the south side of I-70 by moving it to the north.

A major benefit of ATC 65 is that it greatly simplifies the construction of the trench section. Attachments D through G show the sequence of construction with ATC 65. In Phase 1, Stage 1, the majority of the trench is constructed. I-70 traffic is maintained in its current location on the existing viaduct. Existing 46h Avenue is maintained for East-West traffic. In Phase1, Stage 2, WB I-70 traffic is moved to its permanent location in the trench. Construction of the trench is completed after the existing WB viaduct is demolished at the west tie-in point. In Phase 2, Stage 1, EB I-70 traffic is moved to its permanent location in the trench, the existing EB viaduct is demolished, and 46th Avenue South is constructed.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

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

This is an optimization specific to the Central 70 Project. However, similar configurations of frontage roads or other facilities overhanging freeways are common. Several examples include I-635 and the Central Expressway, both in Dallas, Texas.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

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

The following information was requested by the Procuring Authorities in the response to FRMG's Conceptual ATC. Responses follow the requested item.

1. ***Requested Information***: Please provide additional information regarding the accommodation of utilities.

   Response: This section provides information on the differences in utility systems between FRMG's Base Design and the alternative design presented by ATC 65. With ATC 65, the mainline alignment of I-70 will be shifted north in the section between Brighton Boulevard and Colorado Boulevard. As indicated in the Reference Documents, a number of public and private utilities in this section of I-70 will require removal or relocation to accommodate construction of the Central 70 project.

   FRMG considered utility impacts in this section when developing a Base Design. The implementation of ATC 65 would require essentially the same set of utility removals and relocations with several exceptions that are described here. Utilities that would be handled differently with ATC 65 are located between York Street and Vasquez Boulevard. They involve several water lines, two sanitary sewer lines and a storm drain line as described below and shown on Attachment H.

   Water Lines:

   In FRMG's Base Design, north-south water lines in Clayton Street, Thompson Court, and Josephine Street would be removed for construction of the trench section of Central 70. New east-west water lines (DWD-W-204) are proposed on the north and south sides of I-70 to reconnect north-south lines to maintain water network looping.

   With ATC 65, the trench section of the I-70 is moved close to the northern Right-of-Way boundary. This requires that a portion of 46th Avenue North be placed on structures over the freeway lanes. With this shift, there is not enough Right-of-Way available on the north side to construct all of the proposed new east-west water lines to reconnect the water lines in Clayton, Josephine and Thompson. The differences between ATC 65 and FRMG's Base Design are described below. ATC 65 will:

   - Delete plans for the proposed water lines between Columbine Street and York Street, and between Thompson Court and Fillmore Street.
   - Construct a new 6-inch east-west water line between Thompson Court and Columbine Street.
   - Extend the 6-inch water lines in Clayton Street and Josephine Street north-south through the new Central 70 bridge structures (similar to DWD-W-205) and connect to the new DWD-W-204 water line in 46th Avenue South.

   In total, these changes will require about the same length of new water lines and will retain a fully looped water network in the project area.

Sanitary Sewer Lines:

The differences in sanitary sewer line plans between the Reference Design, FRMG's Base Design and the ATC 65 design are described below:

- In the Central 70 Reference Design, an 8-inch sanitary sewer line (DWWMD-SS-212) in the north-south alley between Columbine and Josephine is shown to be removed within the new I-70 Right-of-Way. A new 8-inch sanitary sewer line (Proposed DWWMD-SS-212) is proposed for construction along the proposed north Right-of-Way line of I-70, from the existing alley sewer line to flow westerly to connect with the sanitary sewer system in York Street. In fact, the sewer line DWWMD-SS-212 currently flows to the north from the proposed new I-70 Right-of-Way. The proposed east-west line is not required in any case.

- With ATC 65, existing sewer DWWMD-SS-212 will be capped at the north I-70 Right-of-Way line, with any existing sewer line to the south to be removed. The existing 8-inch sewer line will continue to flow to the north. This line is mentioned for ATC 65, not because the solution is different than for FRMG's Base Design, but because the solution for either case is different than the Reference Documents.

- The existing 8-inch sanitary sewer in Clayton Street (DWWMD-SS-216) currently flows to the south from a manhole that is about 100 feet of north the proposed I-70 north Right-of-Way line. It flows to an existing east-west sewer line (DWWMD-SS-217) that is to be removed for the Central 70 project. A manhole that is about 80 feet north of the first manhole is the beginning of an 8-inch sewer line that flows north. With ATC 65, the southern portion of existing the sewer line (DWWMD-SS-216) will be removed. It will be replaced within the Clayton Street Right-of-Way and on the same alignment with new 8-inch sewer line, about 180 feet in length, to connect to the existing sewer that flows to the north. The existing residential service lines will be reconnected.

Storm Sewer:

FRMG's Base Design includes a detention pond in the northeast quadrant of the I-70/Vasquez Boulevard interchange to collect and detain off-site storm drainage. Stormwater would be discharged to a new storm sewer along the north side of I-70, constructed within the proposed Right-of-Way. This storm sewer would flow west to York Street and connect to the storm sewer system at that location.

With the design for ATC 65:

- A second detention pond will be constructed on available Right-of-Way west of Vasquez and south of 47th Avenue. It will provide additional detention capacity beyond that provided by the detention pond east of Vasquez, further reducing peak flows.

- The new west pond will discharge into a new storm sewer that is part of the Denver Storm Drainage Master Plan. The new line would be constructed as part of ATC 65 from Vasquez and 47th to Milwaukee Street as a 36-inch storm sewer and would continue as a 36-inch line north to 48th Avenue. It would continue west in 48th as a 60-inch line to Clayton Street where it would connect into an existing storm sewer.

- The completed new storm sewer line would be in place as part of the Master Plan storm sewer system. Future extensions would complete the storm sewer as the Master Plan is fully implemented.

Tunnel MEP Systems:

In FRMG's Base Design, the mechanical, electrical and plumbing (MEP) systems for the I-70 tunnel would be constructed on the north side of the tunnel wall. The MEP systems are required to be on the north side because the WB tunnel would be constructed first and placed in two way operation so the existing viaduct can be demolished. The MEP systems must be operational for this to happen and the only place available is the north side of the tunnel.

With ATC 65, the Cover MEP systems would be installed on the south side of the tunnel. There is sufficient space on the south side to construct the MEP systems, which can be operational when WB traffic is placed in the tunnel. This would reduce the length of time that construction would occur in front of the Swansea Elementary School as discussed for Item 7 below.

2. ***Requested Information:*** Please provide additional information regarding the overall highway footprint. Does the footprint change in size?

   Response: The overall highway footprint does not change in size with this ATC. A portion of the I-70 WB lanes are "tucked under" 46th Avenue North, creating additional available space on the south side of I-70. All ramp and local street connections are maintained, and the difference in footprint of these elements from FRMG's Base Design is negligible. With ATC 65, there is less of I-70 visible from above in the locations where 46th Avenue North overhangs the freeway. A case can be made that this results in the overall footprint of the project being decreased.

3. ***Requested Information:*** Please provide additional information on the alignment of 46th Avenue South. How much additional space would be created on the south side of the project because of the shift?

   Response: 46th Avenue South is maintained in the same location as in the Reference Design and in FRMG's Base Design. By shifting I-70 to the north, approximately 47,540 square feet of additional space is created on the south side of the project.

4. ***Requested Information:*** Please provide additional information regarding any due diligence that Front Range Mobility Group has performed to determine if additional air quality or noise impacts are created by the shift.

   Response: FRMG has done additional due diligence to determine that there are no additional air quality or noise impacts associated with the implementation of ATC 65. The results of that due diligence are described as follows.

Air Quality:

Using screening-level techniques, FRMG analyzed the air quality impacts of a semi-transverse ventilation system for the tunnel in which emissions produced within the tunnel were exhausted horizontally from a plenum structure located near the northwest corner of Fillmore Street and 46th Avenue North. That conservative analysis found that impacts at locations consistent with those analyzed in the Final EIS will be below the NAAQS and below or equivalent to maximum impacts disclosed in the Final EIS Reference Design modeling assessment. These conclusions are equally applicable to ATC 65 given the similarity between the previous analyzed design and ATC 65. While the two designs are similar, there are two differences that make ATC 65 the better design from an air quality perspective:

- The ATC 65 plenum exhaust is considerably further from Swansea Elementary School than the previously analyzed exhaust location; therefore, air quality impacts from ATC 65 should be lower at Swansea Elementary School than those predicted for the Base Design.

- The ATC 65 plenum exhaust will be located between 46th Avenue South and I-70 making it much less likely that the public will be in close proximity to the exhaust where impacts are the highest.

Aside from the aforementioned advantages, impacts are expected to be comparable between the two designs primarily due to the fact that the plenum exhaust structures will be the same and both will exhaust toward I-70. As shown in Attachment I the only substantive difference between the two designs is that the ATC 65 plenum exhaust will be located on the south side of I-70 between Clayton Street and Fillmore Street, whereas, the plenum was on the north side of I-70 in FRMG's Base Design.

FRMG is performing a full air quality analysis on ATC 65 and will transmit to the Procuring Authorities within the next several weeks when it is complete.

Noise:

ATC 65 will shift I-70 lanes approximately 45 feet to the north and further from sensitive receptors on the south side of the project when compared to the Base Design, resulting in a decrease in noise in that location. Given that the closest sensitive receptors are approximately 100 feet from the centerline of the nearest Base Design traffic lane in this location, the 45-foot change at this distance will result in an approximate 3.3 dB decrease in sound levels at sensitive receptors on the south side of I-70.

On the north side of the project, sensitive receptors should not experience a change in noise because of the overhanging 46th Avenue structures over the closest I-70 lanes. ATC 65 involves sliding I-70 under 46th Avenue North with the location of 46th Avenue North remaining relatively unchanged. Since 46th Avenue North will overhang I-70, the line of sight from sensitive receptors on the north side of the project to noise sources on I-70 should not change, therefore having no additional impact on noise levels at sensitive receptors due to I-70 traffic.

This basic analysis shows that noise levels at nearby sensitive receptors will remain unchanged or decrease as a result of ATC 65. In addition, the close proximity of 46th Avenue North and South to sensitive receptors coupled with the fact that sound from I-70 will be produced below grade and partially shielded by trench sides, indicates that noise impacts at sensitive receptors are equally dominated by noise from traffic on 46th Avenue North and South as from I-70. Therefore, the role of impacts from 46th Avenue North and South will mask the changes in sound level occurring from I-70 alone.

FRMG is performing a full noise analysis on ATC 65 and will transmit to the Procuring Authorities within the next several weeks when it is complete

5. ***Requested Information:*** Please provide an analysis of any traffic impacts or benefits that are created by the shift.

   Response: Since all lanes on I-70, ramps, and connectivity to local streets are maintained with this ATC, there are no impacts to traffic with its implementation. Minor intersection modifications that were made with this ATC were evaluated from a traffic standpoint to make sure all movements are provided and traffic operations were maintained.

6. ***Requested Information:*** Please provide additional information regarding the bookend modifications for 46th on the northeast and northwest corners of the Cover.

   Response: With this ATC, the bookends on the northeast and northwest corners of the Cover will remain essentially the same as in FRMG's Base Design. Attachment J shows the bookends in plan view, and in elevation view where 46th Avenue North meets the bookend at Clayton Street. At the southeast and southwest corners of the Cover, there will be direct connections between the bookends and the available space on the south side of I-70. Also, with 46th Avenue North overhanging the freeway, there will be less freeway visible from the bookends.

7. ***Requested Information:*** Please provide additional information on the impact this ATC would have to the Swansea Elementary School layout during construction.

   Response: The basic concept of ATC 65 is to shift the alignment of the I-70 underground trench to the north while leaving the Cover's surface features unchanged. In the final condition, the school grounds, multi-use field and central plaza area would be the same as shown in the Reference Documents. The only permanent difference would be at the northwest edge of the multi-use field where the planting area shown in the Reference Documents between field and the school parking area would be about 8 feet narrower from Columbine Street east for about 80 feet. This is because of the grade differences necessary to provide a flat multi-use field while matching grades for the school parking area and Columbine Street.

   With respect to impacts on the school during construction, both the Base Design and ATC 65 need to be considered. Attachment K provides a plan view of the area in front of Swansea Elementary School, along with a section for the Base Design and another for ATC 65. The plan view shows that the proposed Right-of-Way for the Base Design would be about 72 feet south of the school building, and the back of the tunnel wall would be about 110 feet south. For ATC 65, the Right-of-Way would be about 60 feet south and the back of tunnel wall about 65 feet south. The sections show the same information, along with more detail.

   The Base Design Section shows the Right-of-Way as provided in the Reference Documents and the back of the tunnel wall for the Base Design. While about 38 feet of Right-of-Way space is available behind the wall, significant MEP facilities must be constructed in this area. They include:

   - A large ventilation plenum, fire water piping and valve vaults, electrical and ITS duct banks and a storm sewer. Structural tiebacks would also be installed underground in this area.

   - Separation criteria between utilities will dictate that the entire 38 feet be used for the MEP systems, which means that construction activities will continue in this area for about a year after the tunnel wall is constructed and the tunnel girders set.

- The required temporary wall will be set about 5 feet outside of the Right-of-Way line to provide protection for school children from the construction that will occur on the I-70 side. This will allow continued use of the northern play areas at the school during construction activities.

The ATC 65 Section shows:

- The MEP systems will be moved to the south side of the tunnel, with only a small water line installed north of the tunnel wall.

- Tiebacks behind the tunnel wall will be installed from the I-70 side which will not disrupt surface features on the north side.

- The temporary wall would be set about 5-feet outside the Right-of-Way line to provide protection from construction on the 1-70 side. This would place the temporary wall at about 55 feet south of the School building, which would allow use of the north 25 feet of the school play areas, which are 35 feet wide.

In summary, construction of ATC 65 underground facilities in the vicinity of Swansea Elementary School will be about 12 feet closer to the school building, but will require about 12 months less construction time. Construction of either the Base Design or ATC 65 will affect use of the school yard and play areas during the period of construction. Permanent facilities for the Cover will be virtually identical for either design, with only a minor effect on transition grading in a planting area resulting from ATC 65.

8. ***Requested Information:*** Please provide an analysis of the impacts to UPRR structure and trackwork plans if this ATC is implemented.

   Response: With implementation of ATC 65, the UPRR structure would be shifted to the south about 11 feet and rotated about 2 degrees to match the new alignment of I-70. This accommodates the temporary and permanent trackwork plans provided by UPRR. The bridge structure would have the same span arrangement as for FRMG's Base Design, with minor dimensional changes to some span lengths.

   It should also be noted that there are no impacts to the BNSF bridge structure as a result of ATC 65.

9. ***Requested Information***: There is concern about the operational impacts of moving the Steele Street ramps closer to 45th Avenue. It is highly undesirable to operate the 45th Avenue and Steele Street signals as a single signal. Please address options to minimize or eliminate the relocation of the Steele Street ramps.

   Response: At the meeting with the CDOT and the City and County of Denver on January 24, 2017, FRMG showed a layout that shifted the EB off ramp to Steele Street/Vasquez Boulevard to the south of the ramp in the Reference Design and in FRMG's Base Design. This resulted in the ramp being closer to the intersection of 45th Avenue. FRMG indicated that the ramp terminal intersection and the 45th Avenue intersection could be operated with a single signal. Since that meeting, FRMG has moved the EB off ramp to Steele Street/Vasquez Boulevard back to the north to coincide with the location of the ramp in the Reference Design and FRMG's Base Design. In this location, the ramp terminal and 45th Avenue intersection will operate as independent intersections with separate signals. FRMG is aware that locating the ramp terminal in this location will require a 6 percent grade on the ramp, which will constitute a design exception, and require approval from CDOT and FHWA.

10. ***Requested Information:*** Please indicate any impacts to the southwest and southeast quadrants of the Steele/Vasquez interchange if the ATC is implemented.

    Response: Since the EB off ramp to Steele Street/Vasquez Boulevard and the EB on ramp to I-70 have been moved back to the north with this ATC to coincide with the Reference Design and FRMG's Base Design, there will be no negative impacts to the southwest and southeast quadrants of the Steele/Vasquez interchange. With the shift of I-70 to the north, there is additional developable space just south of these ramps.

11. ***Requested Information:*** Please provide additional details to demonstrate that implementation of this ATC does not preclude the second cover (see Paragraph 1.17a of Section 1 of Schedule 10).

    Response: As shown on the attached exhibit, Attachment L, implementation of this ATC does not preclude the second cover. The second cover can be implemented as envisioned by the Procuring Authorities if this ATC is implemented.

12. ***Requested Information:*** The presentation on January 24th provided a plan view plot with a vision for a greenway with sidewalks, trees, etc. Please clearly indicate which of the depicted elements would be included as a part of implementation of this ATC and constructed by FRMG at FRMG's cost.

    Response: The attached exhibit, Attachment M shows the depicted elements that would be implemented as part of this ATC and constructed by FRMG at FRMG's cost. This included additional trees, landscape material, irrigation, sidewalks and paths (in some cases requiring additional bridge width), and other hardscape materials as conceptually outlined in Section B.5 above. FRMG will allocate $2.225M Base MPP over the term of the Project for these enhanced elements and will work with the Procuring Authorities to determine the exact elements that will be most beneficial to the project and the community.

13. ***Requested Information:*** Please outline the process that FRMG would follow regarding getting community input and gaining consensus for the use and features of the additional area on the south side of I-70 that is created if this ATC is implemented.

    Response: FRMG's first step in getting community input and gaining consensus for the use and features of the additional area on the south side of I-70 will be to adhere to those commitments already established in the FEIS/ROD. This will focus on the commitment to utilize the vision of the Swansea/Elyria Neighborhood Plans as guidance in the development of the Central 70 Corridor in this area. FRMG will utilize the existing input mechanisms established in the neighborhood plan process and on-going neighborhood interactions being led by CDOT and the City and County of Denver. This process will also be embedded in FRMG's *Strategic Communications Plan* whereby we will work with the Procuring Authorities to meet the specific needs of the stakeholders affected by ATC 65 to gather input regarding uses and features of the additional space on the south side of I-70. The same process will be used to gather input and address public concerns related to any other aspect of ATC 65.

14. ***Requested Information*:** Please outline the process that FRMG would follow regarding additional environmental evaluations that will be required if this ATC is implemented. Also, provide a description of any challenges you foresee, any mitigation strategy FRMG would undertake if necessary, and strategies for implementing a Base Design if, despite best efforts, FRMG is not able to obtain any required approvals.

Response: FRMG will use CDOT's Project Reevaluation Form 1399 (draft attached to this ATC) to evaluate the potential adverse and beneficial impacts from the proposed design changes in ATC 65. A Level 2 Reevaluation is anticipated due to the negligible adverse impacts offset by the substantial benefits caused by the design changes. As required for a Level 2 Reevaluation, FRMG will work with CDOT and FHWA during their review of Form 1399 to gain concurrence on the findings and to complete the Reevaluation documentation.

FRMG will also work with signatories of CDOT's Memorandum of Agreement with Denver Public Schools related to Lot 17 and Lot 32 within Parcel RW-63 to include the required additional Right-of-Way in the agreement. The additional Right-of-Way required is approximately 3,200 sq. ft. and would be considered a minor design change. This minor design change will result in a substantial benefit to the community by creating new, continuous space from west of York Street to east of Garfield Street that can be used to create a linear, open space amenity to the Swansea and Elyria neighborhoods. This linear open space could be used to provide one of the main goals of enhanced multi-modal connectivity found in the Swansea/Elyria Neighborhood Plans.

The City and County of Denver's 2014 Storm Drainage Master Plan identifies the North Race Street Outfall as a proposed project that begins adjacent to the Steele/Vasquez interchange's water quality treatment facility and travels northwest along 47th Avenue, Milwaukee Street, 48th Avenue, and 49th Avenue to North Race Street. FRMG proposes to utilize this planned storm sewer's excess capacity as outfall conveyance from the Steele/Vasquez interchange. This storm sewer is part of an approved Denver master plan and falls within City and County of Denver Right-of-Way. Advancement of the construction of this line as part of the Central 70 project will accelerate the solution for a local need of additional stormwater conveyance without compromising system capacity. Construction of this storm sewer will be included in the Reevaluation that is part of this ATC.

FRMG's approval mitigation strategy for ATC 65 will include design and submittal preparation upon announcement of the Preferred Proposer, at our own risk prior to execution of the Project Agreement. We expect that we will formally begin the approval process with the Procuring Authorities upon execution of the Project Agreement. FRMG will monitor the progress of development and acceptance of the improvements in this ATC. If by a key milestone date to be identified in the Project Schedule, significant progress toward final approval has not been made, FRMG will enact a pre-prepared strategy to implement our Base Design to maintain the project schedule.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

FRMG does not envision additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of this ATC. Refer to Items 13 and 14 in Section 9, Additional Information for additional discussion regarding implementation of this ATC.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

There will be no changes to the handback procedures and/or the Handback Requirements.

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

As indicated, this ATC will require one minor subsurface ROW acquisition measuring approximately 12 feet by 265 feet at the Swansea Elementary School, to accommodate I-70 in the Lowered Section. Since this would be a transfer of property between Denver Public Schools (DPS) and CDOT, it is envisioned that in return for the benefits to the school and community associated with this ATC, the additional property would be transferred to CDOT through modification of the Memorandum of Agreement (MOA) between DPS and CDOT.

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

The required or likely to be required approvals associated with this ATC are as follows:

- Environmental Reevaluation due to shifting I-70 to the north and storm sewer construction along Milwaukee Street and 48th Avenue to connect to an existing storm sewer in Clayton Street.
- Additional subsurface ROW acquisition (property transfer between DPS and CDOT)
- Approval by CDOT and FHWA of the Design Exceptions listed in the Design Exceptions table below.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

The following RFP sections will be revised as part of this ATC as follows:

- Schedule 10, Section 9.4.2.c.ii.A shall read “The Steele Street/Vasquez Boulevard westbound entrance ramp shall provide a minimum of ~~750~~ 600 feet dual ramp meter queuing as measured from the ramp meter stop bar to the cross street.”
- Schedule 10, Section 9, Appendix A Roadway Design Criteria shall read “Shoulder width requirement for Vasquez Boulevard WB Entrance Ramp is 8 feet where attainable, and 6 feet where 8 feet is not attainable”

- Schedule 10, Section 9, Appendix A Roadway Design Criteria shall read "Steele Street EB Exit Ramp shall have a maximum grade of ~~5%~~ 6%."
- Schedule 11, Section 3.2.10 shall remain as it currently reads: "Developer shall perform the O&M Work of all landscaped and vegetated areas on the Site, with the exception of any landscaped areas on top of the Cover. The additional landscaped and vegetated areas added as part of this ATC will be covered under this provision.
- Schedule 11, Appendix D shall be modified with the additions as follows:

Existing Structure No.	**New Structure No.**	**Structure Location and Description**	**Operations and Maintenance Responsibility** (O&M Period During Construction)	**Operations and Maintenance Responsibility** (Operating Period)
N/A	TBD	46th Ave North from Milwaukee St. to Clayton St.	Developer (at completion of Milestone 3, and as per Section 2.2.2 of this Schedule 11)	Developer (as per Section 3.2.2 of this Schedule 11)
N/A	TBD	46th Ave North from Columbine St. to York St.	Developer (at completion of Milestone 3, and as per Section 2.2.2 of this Schedule 11)	Developer (as per Section 3.2.2 of this Schedule 11)

In addition, with this ATC, the Memorandum of Agreement (MOA) between Denver Public Schools and CDOT shall be modified to transfer Lots 17 and 32 of Parcel RW-63 to CDOT to accommodate implementation of this ATC.

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.	Schedule 10, Section 9.4.2.c.ii.A	The Steele Street/Vasquez Boulevard WB entrance ramp shall provide a minimum of 750 feet dual ramp meter queuing as measured from the ramp meter stop bar to the cross street.	This ATC provides approximately 600 feet dual ramp meter queuing.		
2.	Schedule 10, Section 9, Appendix A Roadway Design Criteria:	Shoulder width requirement for Vasquez Boulevard WB Entrance Ramp is 8 feet.	This ATC provides an 8-foot outside shoulder width for the first 300 feet of the Steele WB Entrance Ramp. The remaining 1300 feet of the ramp has a 6-foot outside shoulder.		
3.	Schedule 10, Section 9, Appendix A Roadway Design Criteria.	Steele Street EB Exit Ramp shall have a maximum grade of 5%.	In order to facilitate construction while the existing viaduct remains in place, the Steele EB Exit ramp gore was shifted to the east. This ATC provides 6% maximum grade in order to match the Reference Design ramp terminal location and maintain intersection spacing between the ramp terminals and 45th Avenue.		

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 65.1

Attachment A	**General Layout**
Attachment B	**Cross Sections at Cover**
Attachment C	**Cross Sections at West Cover Portal**
Attachment D	**Construction Sequences**
Attachment E	**Phase 1, Stage 1**
Attachment F	**Phase 1, Stage 2**
Attachment G	**Phase 2, Stage 1**
Attachment H	**Utilities, Railroad and Drainage**
Attachment I	**Exhaust Locations**
Attachment J	**Cover Bookends**
Attachment K	**Swansea Elementary School Details**
Attachment L	**Future Cover Location**
Attachment M	**Potential Corridor Enhancements**

Draft Re-Evaluation Form 1399


BRIGHTON BLVD
WILLIAMS ST
HIGH ST
RACE ST
VINE ST
GAYLORD ST
CLAUDE CT
YORK ST
JOSEPHINE ST
47TH AVE
COLUMBINE ST
ELIZABETH ST
Swansea Elementary School
Additional Right-Of-Way
CLAYTON ST
FILLMORE ST
MILWAUKEE ST
VASQUEZ BLVD
BNSF RAILROAD
COLORADO BLVD
Existing Viaduct Westbound
Existing Viaduct Eastbound
45TH AVE
UNION PACIFIC RAILROAD
YORK ST
JOSEPHINE ST
COLUMBINE ST
ELIZABETH ST
THOMPSON CT
CLAYTON ST
FILLMORE ST
MILWAUKEE ST
ST PAUL ST
STEELE ST
ADAMS ST
COOK ST
MADISON ST
GARFIELD ST
ATC 65 CONCEPT
Existing ROW
Proposed ROW
Additional Right-Of-Way
Proposed Design
Existing Viaduct
Proposed WB 46th Overhang
Proposed Bridges/Cover Area
New Available Space
Opportunity Area to Tie into New Space
Proposed Trench/Retaining Wall
0' 100' 200' 400'

Front Range Mobility Group

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ATTACHMENT A - ATC 65 LAYOUT

ATC SUBMITTAL

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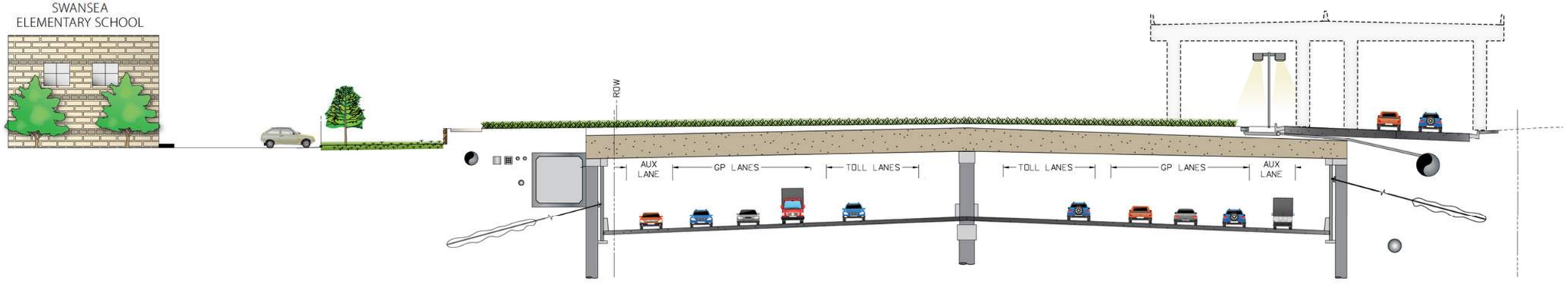
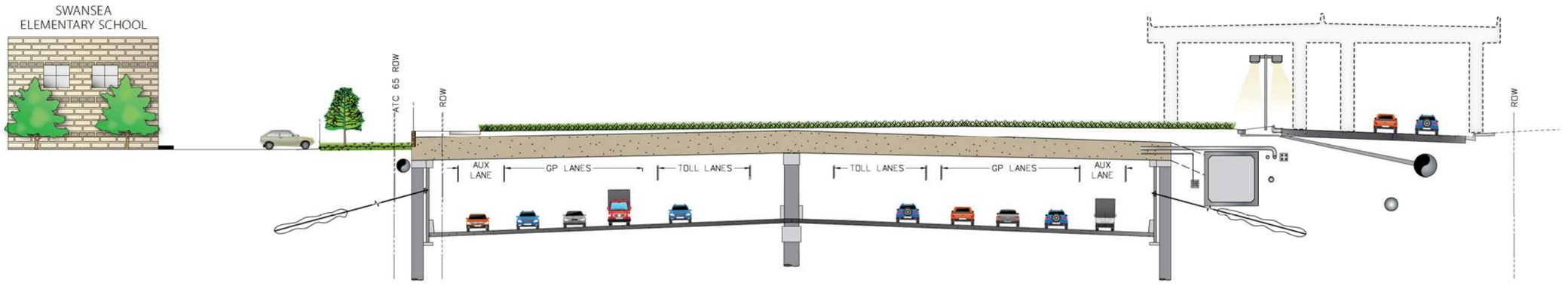
BASE DESIGN
COVER CROSS SECTION



ATC 65
COVER CROSS SECTION



Attachment B
Cross Sections at Cover
ATC 65 vs. Base Design

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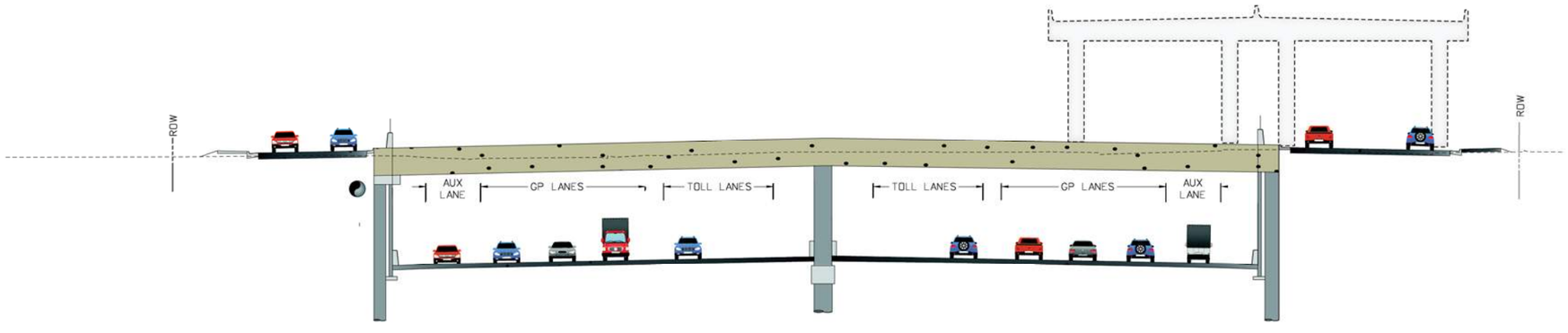
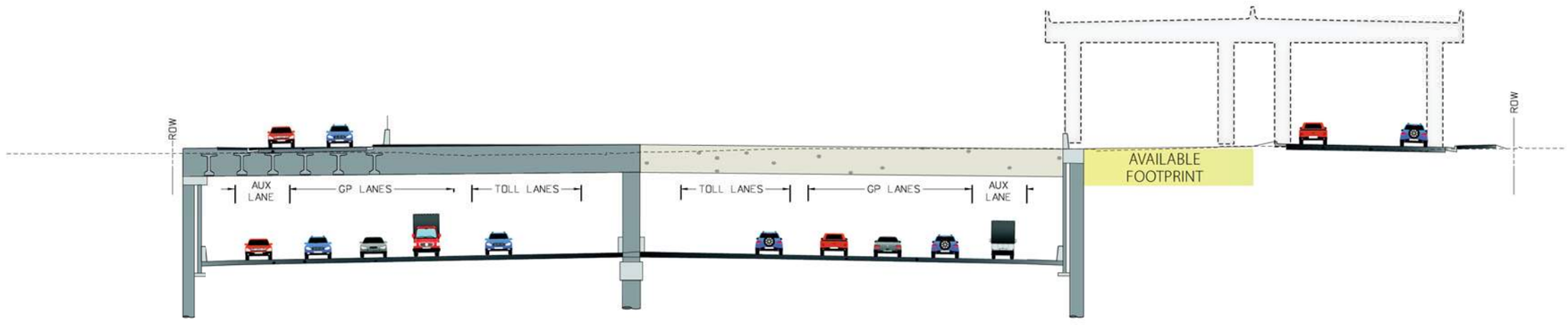
BASE DESIGN
WEST PORTAL COVER CROSS SECTION



ATC 65
WEST PORTAL COVER CROSS SECTION



Attachment C
Cross Sections at West Cover Portal
ATC 65 vs. Base Design

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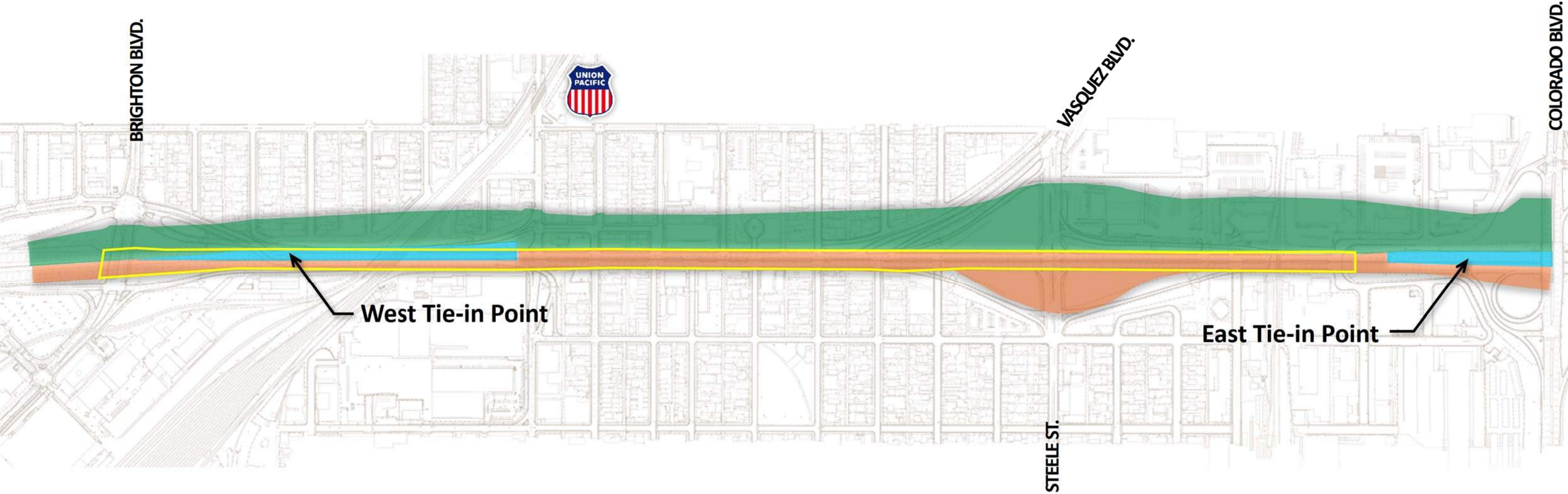

- Phase 1, Stage 1 – Build Majority of Trench
- Phase 1, Stage 2 *(Tie-ins)* – Build Tie-ins to Finish Trench
- Phase 2, Stage 1 – Build 46th Ave S. & Remove EB Viaduct
- Existing Viaduct

Attachment D
ATC 65 Construction Sequence

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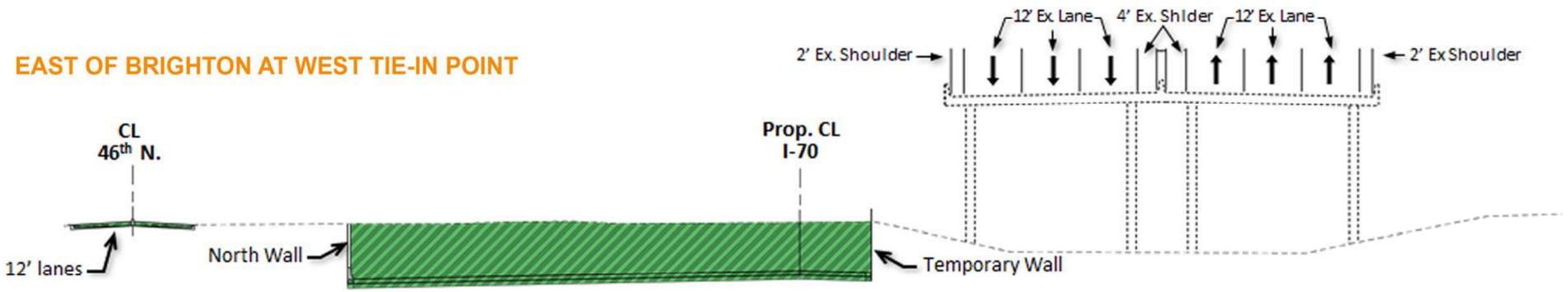
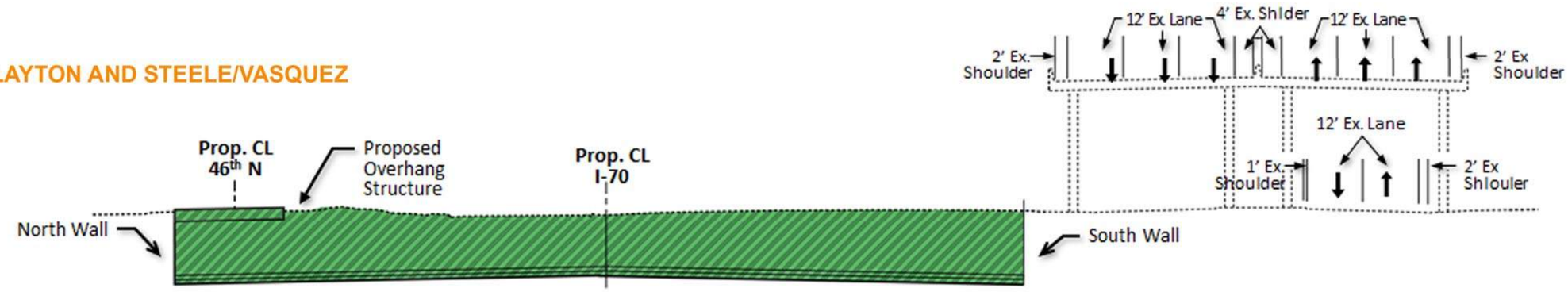
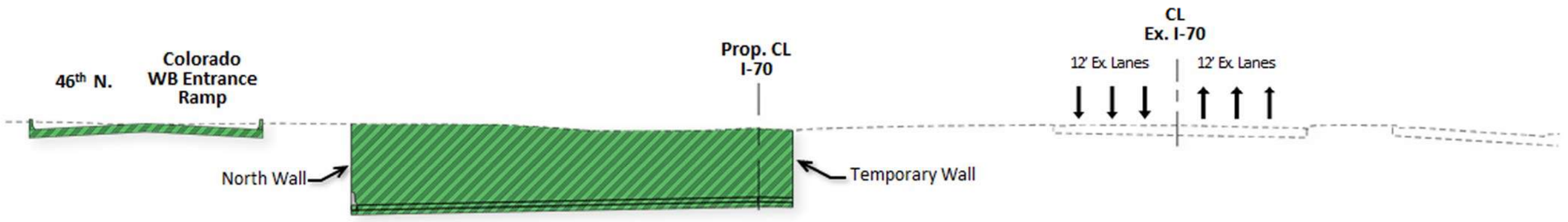
EAST OF BRIGHTON AT WEST TIE-IN POINT



BETWEEN CLAYTON AND STEELE/VASQUEZ



WEST OF COLORADO AT EAST TIE-IN POINT



Attachment E
ATC 65 Phase 1, Stage 1

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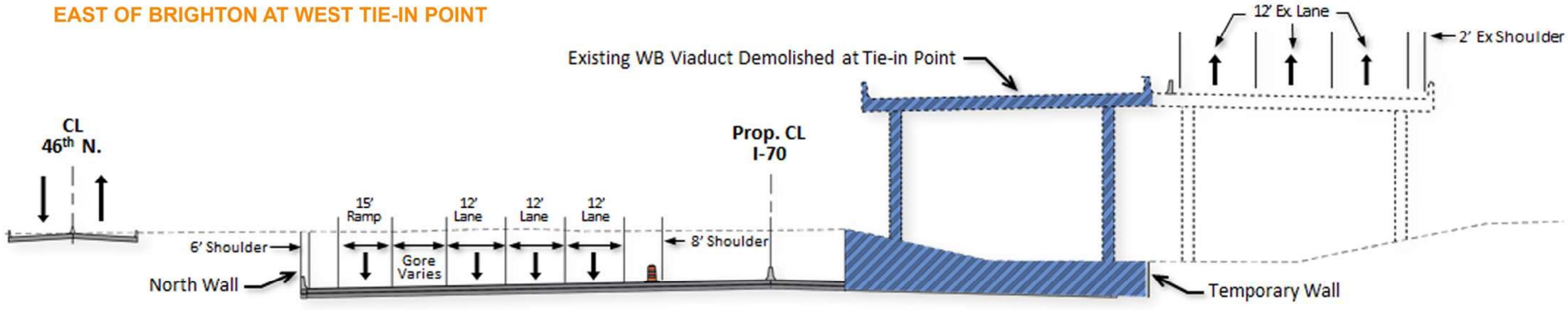
EAST OF BRIGHTON AT WEST TIE-IN POINT



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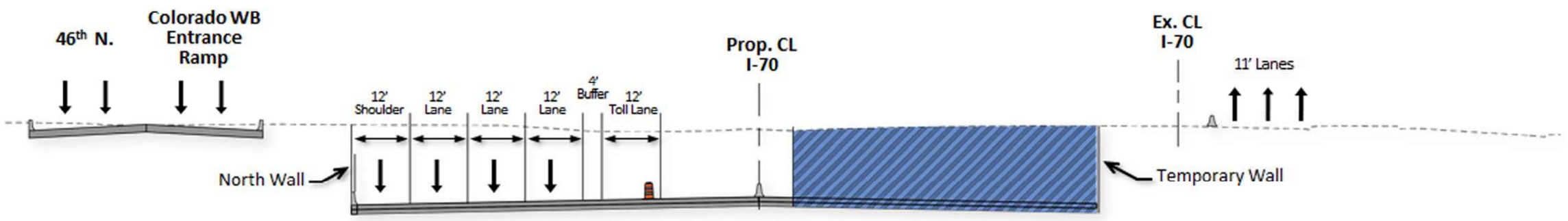

Attachment F
ATC 65 Phase 1, Stage 2

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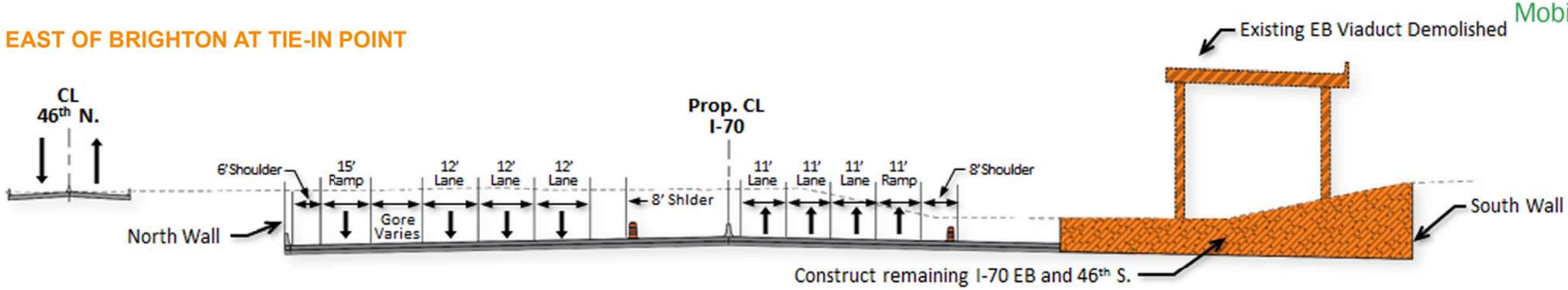
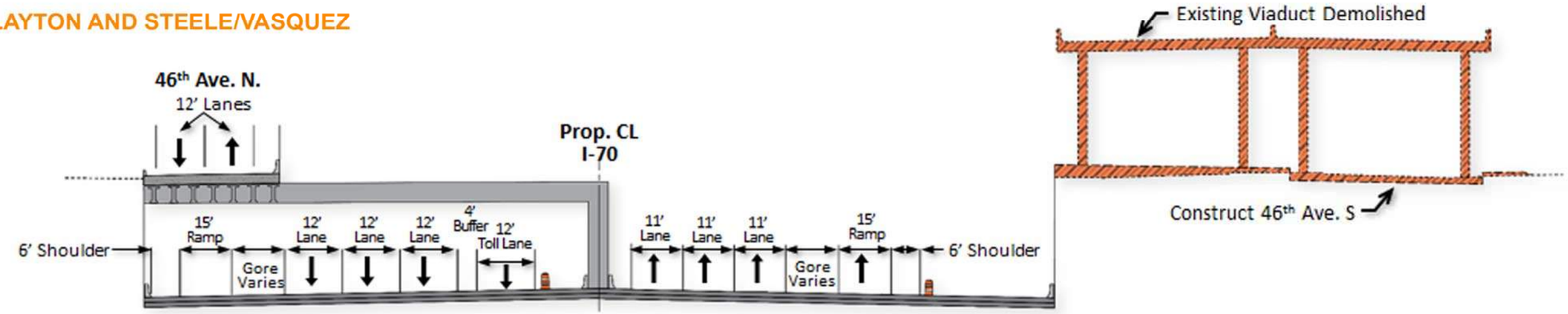
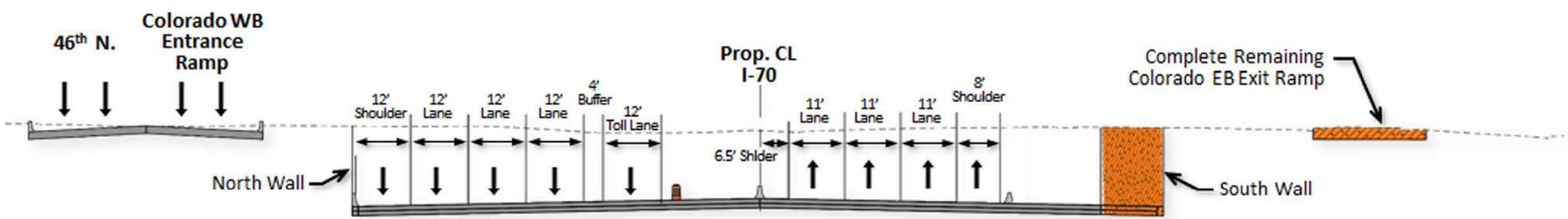
EAST OF BRIGHTON AT TIE-IN POINT



BETWEEN CLAYTON AND STEELE/VASQUEZ



WEST OF COLORADO AT TIE-IN POINT



Attachment G
ATC 65 Phase 2, Stage 1


BRIGHTON BLVD
WILLIAMS ST
HIGH ST
RACE ST
VINE ST
GAYLORD ST
CLAUDE CT
YORK ST
JOSEPHINE ST
COLUMBINE ST
ELIZABETH ST
CLAYTON ST
FILLMORE ST
MILWAUKEE ST
VASQUEZ BLVD
BNSF RAILROAD
COLORADO BLVD
UTILITIES
CUT AND CAP
EXISTING SEWER
(FLOWS NORTH)
UTILITIES
INSTALL WATERLINE
TO MAINTAIN
NETWORK LOOP
UTILITIES
RELAY 200' OF
SEWERLINE TO
FLOW NORTH
UTILITIES
DISCHARGE STORMWATER
TO NEW CITY STORM DRAIN
LINE (PER MASTER PLAN)
RAILROAD
NO IMPACTS TO BNSF
TRACKWORK OR
STRUCTURE PLANS
RAILROAD
NO IMPACTS TO UPPR
TRACKWORK OR
STRUCTURE PLANS
47TH AVE
Swansea
Elementary
School
Storm Drain
Pump Station
Additional
Right-Of-Way
Restroom
Electrical Plant
Room
Water Quality
Treatment
Cover
Electrical Plant
Room
MEP Systems
Substation
FFFS Pump
Station
Generator
Substation
Ventilation Plant
Room
UTILITIES
PROPOSED
WATERLINE
NOT REQUIRED
UTILITIES
PROPOSED
WATERLINE
NOT REQUIRED
45TH AVE
UTILITIES
EXTEND WATERLINE THROUGH
STRUCTURE TO MAINTAIN
NETWORK LOOP
UNION PACIFIC RAILROAD
YORK ST
JOSEPHINE ST
COLUMBINE ST
ELIZABETH ST
THOMPSON CT
CLAYTON ST
FILLMORE ST
MILWAUKEE ST
ST PAUL ST
STEELE ST
ADAMS ST
COOK ST
MADISON ST
GARFIELD ST
UTILITIES/RAILROAD/DRAINAGE
Existing ROW
Proposed ROW
Proposed Design
Existing Viaduct
Proposed WB 46th Overhang
Proposed Bridges/Cover Area
New Available Space
Opportunity Area to Tie into
New Space
Proposed Trench/Retaining Wall
0' 100' 200' 400'
Front Range
Mobility Group
ATC SUBMITTAL

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ATTACHMENT H - ATC 65 UTILITIES, RAILROAD, DRAINAGE

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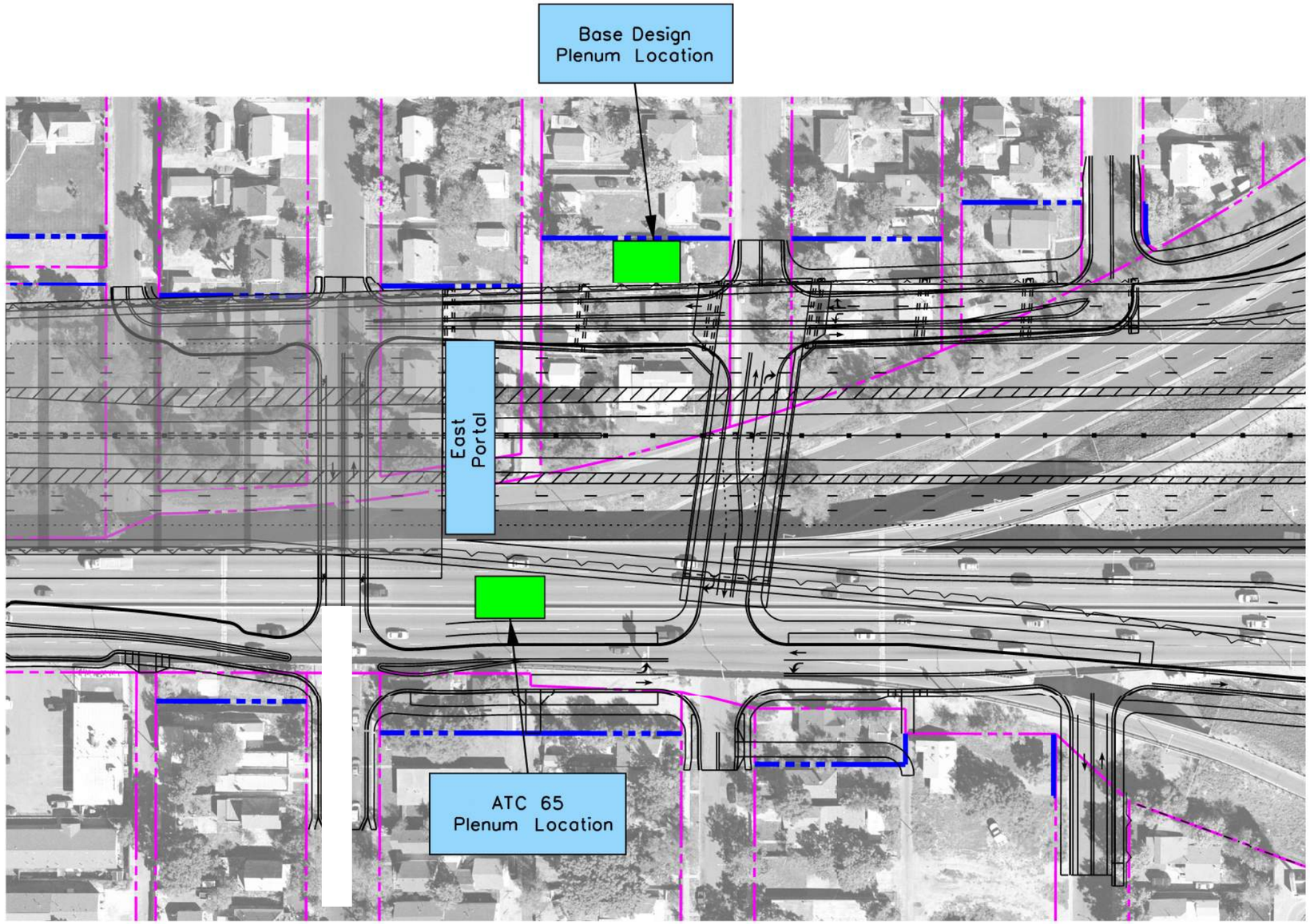

Attachment I
Exhaust Locations
ATC 65 Vs. Base Design

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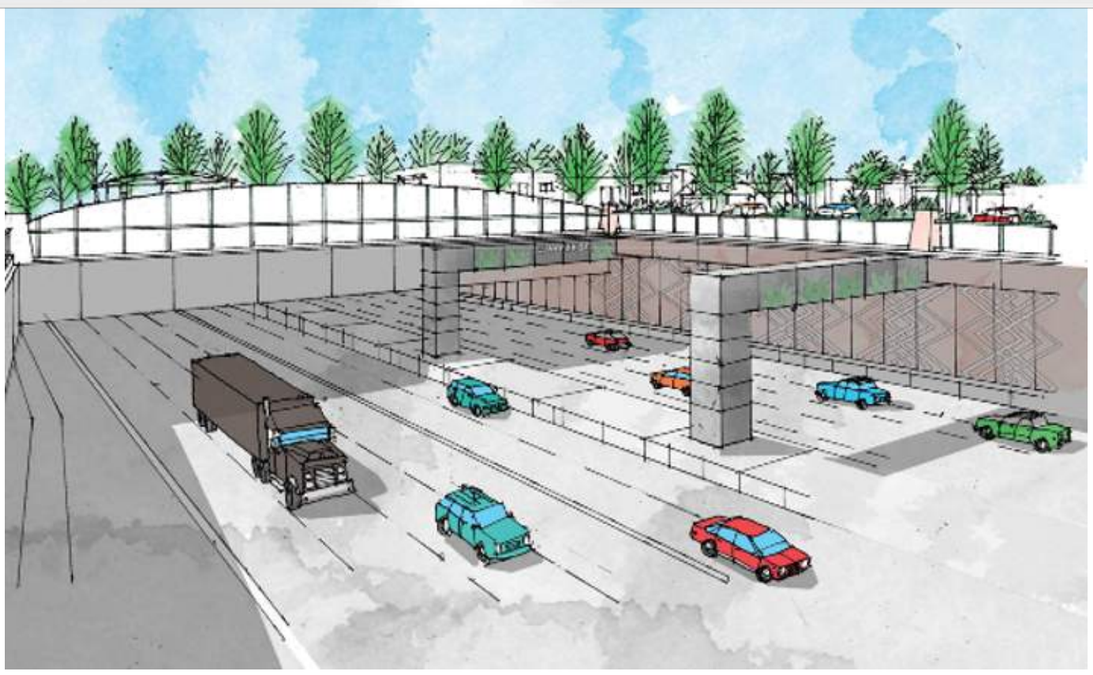

Attachment J
ATC 65 Cover Bookends

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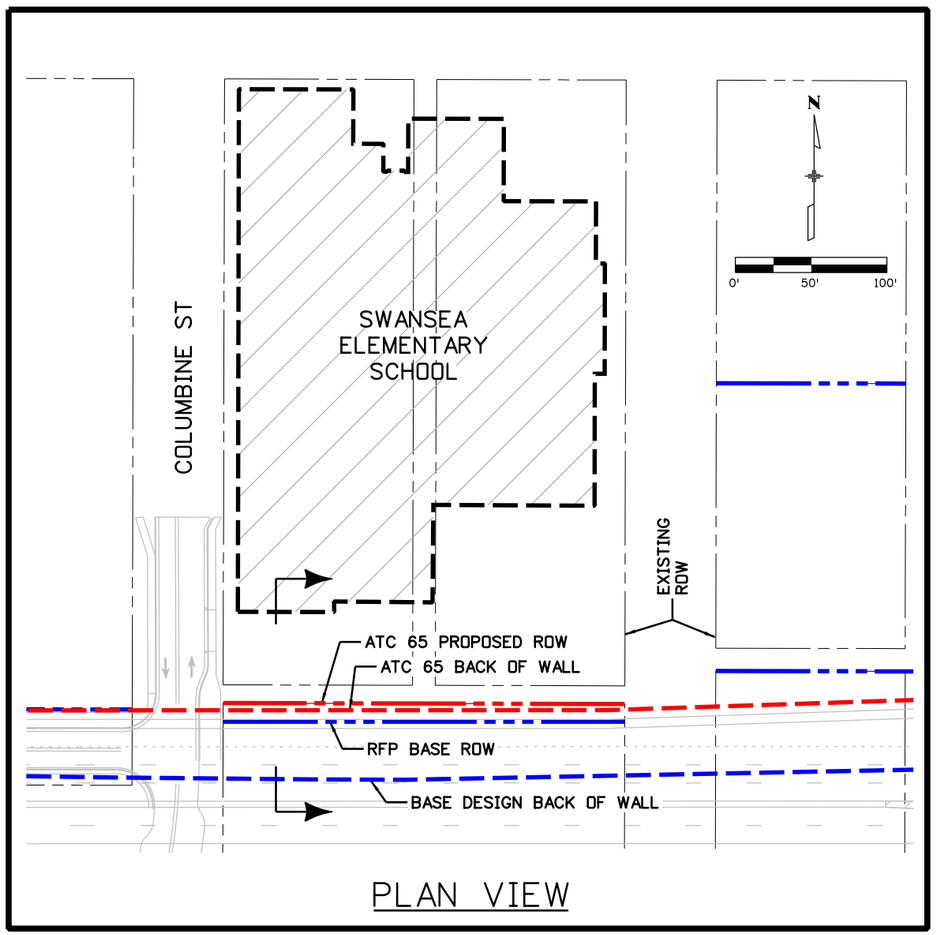
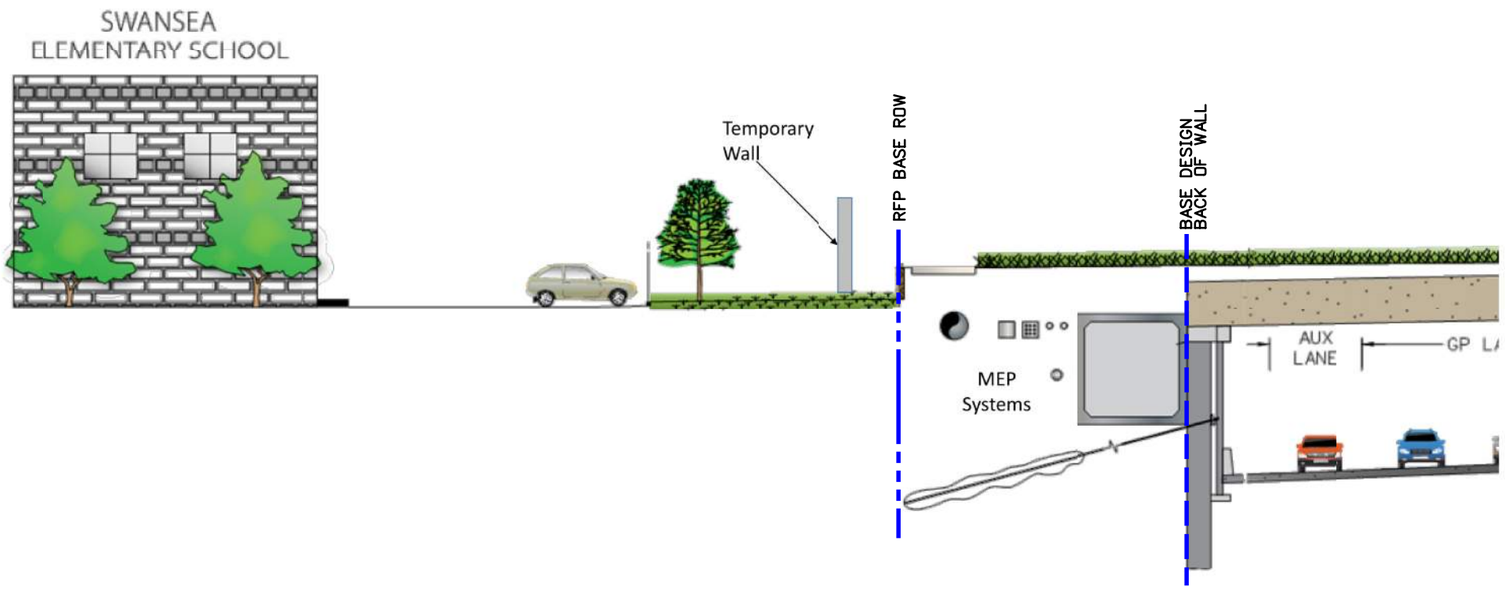
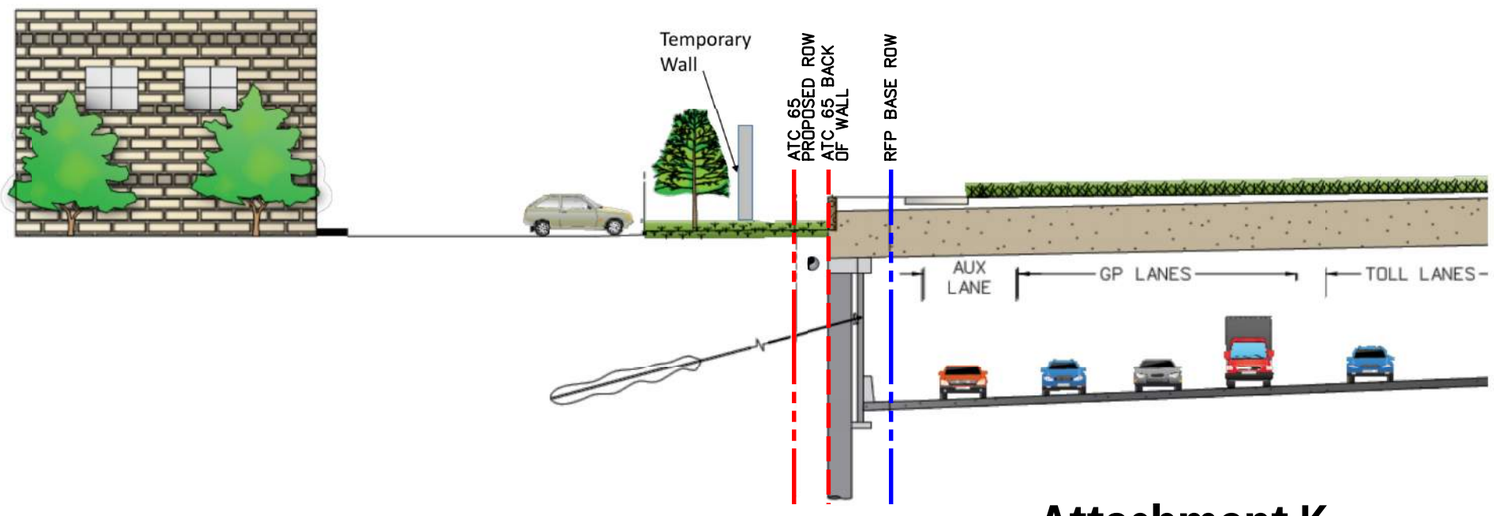


PLAN VIEW



BASE DESIGN COVER CROSS SECTION

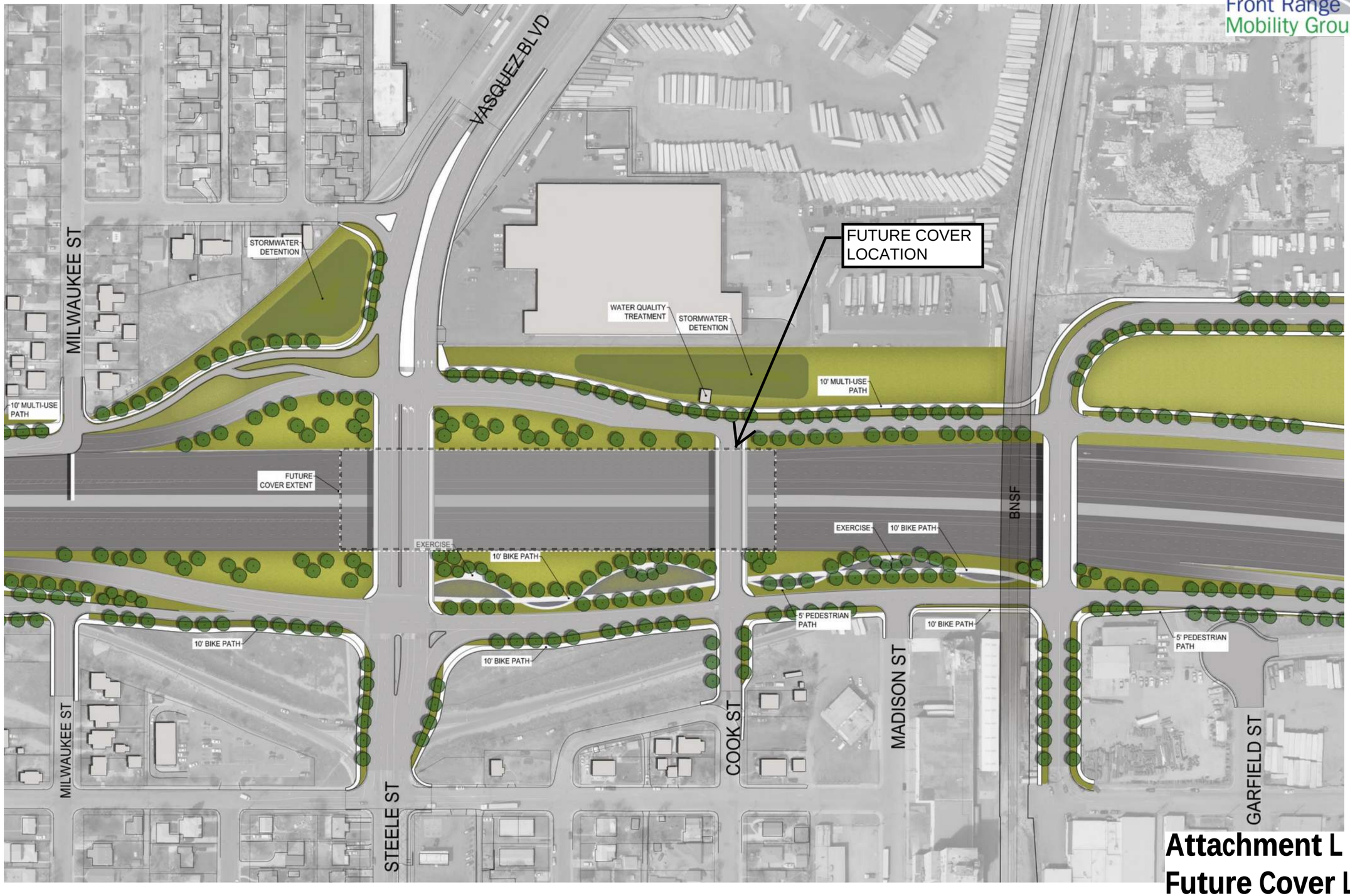


ATC 65 COVER CROSS SECTION

Attachment K
Conditions at Swansea Elementary School
ATC 65 vs. Base Design

CONFIDENTIAL

Front Range Mobility Group



Attachment L
Future Cover Location

Front Range Mobility Group

OVERALL SITE ILLUSTRATIVE PLAN

CONFIDENTIAL

Attachment M
ATC 65 Potential Corridor Enhancements

COLORADO DEPARTMENT OF TRANSPORTATION **REEVALUATION FORM**	Original NEPA Approval Date:	Reevaluation Date:	Project Code:
Project Name and Location: I-70 East (Central 70 Project) - Denver, CO			
NEPA Document Title: I-70 East from I-25 to Tower Road, Denver - Final Environmental Impact Statement (FEIS) and Section 4(f) Evaluation			
Region/Program/Residency:			
Project Description:			
Project Phasing Plan and Portions Completed (if warranted):			
Portion of Project Currently Being Advanced:			
Date(s) of Prior Reevaluations:			

I. Document Type

- ☐ Categorical Exclusion (CE)
- ☐ Environmental Assessment (EA)
- ☐ Finding of No Significant Impacts (FONSI)
- ☐ Draft Environmental Impact Statement (DEIS)
- ☒ Final Environmental Impact Statement (FEIS)
- ☐ Supplemental Environmental Impact Statement (SEIS)
- ☐ Record of Decision (ROD)
- ☐ Other (such as: local funding, etc.) _____

II. Reason for Reevaluation

- ☐ Project is proceeding to the next major approval or action [23 CFR 771.129(c)]
- ☒ Project changes such as laws, policies, guidelines, design, environmental setting, impacts or mitigation (describe: Design change between York Street and Garfield Street)
- ☐ Greater than three years have elapsed since FHWA's approval of the DEIS [23 CFR 771.129(a)] or FHWA's last major approval action for the FEIS [23 CFR 771.129(b)]
- ☐ Other:

_____

Conclusion and Recommendation

☒ The above environmental document has been reevaluated as required by 23 CFR 771.129 and it was determined that no substantial changes have occurred in the social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socio-economic, or natural environment. Therefore, the original environmental document or CE designation remains valid for the proposed action. It is recommended that the project identified here-in be advanced to the next phase of project development. A summary of the review is documented in Section IV.

☐ The above environmental document has been reevaluated as required by 23 CFR 771.129 and it was determined that the environmental document or CE designation is no longer valid or more information is required. Additional required documentation is identified in Section VII.

_____ _____

Regional Planning Environmental Manager or Designee Date

_____ _____

Federal Highway Administration Division Administrator or Designee Date

III. Evaluation

☐ Level 1: Less than three years since last major step to advance the action (e.g. approval of NEPA document, authority to undertake final design, authority to acquire significant portion of ROW, approval of PS&E) and there are no changes in project scope, environmental conditions, environmental impacts or regulations and guidelines.- OR - The document being re-evaluated is a programmatic Categorical Exclusion regardless of time since the last major step to advance the action (as long as the project would still be covered by a programmatic Categorical Exclusion). All decisions in the prior NEPA document remain valid. No FHWA concurrence is required. Note to file and to distribution below.

☒ Level 2: Less than three years since last major step to advance action and there are only minor changes in the project scope and/or updates or explanation needed for one or more resource areas. FHWA concurrence is required.

☐ Level 3: More than three years since last major step to advance action and there are only minor changes in the project scope and/or updates or explanation needed for one or more resource areas. FHWA concurrence is required.

☐ Level 4: Major changes in project scope or environmental commitments, or for EISs when greater than three years have elapsed since the last major project action. Updates or new studies maybe required. A Level 4 Reevaluation may require a separate document. FHWA concurrence is required.

ENVIRONMENT SETTING, AFFECTED ENVIRONMENT, AND ENVIRONMENTAL IMPACT ASSESSMENT:
Document changes to human, socio economic, or natural environment for environmental setting or circumstances. Document changes in impact status. Place check-mark or description where relevant. Note: this list may be expanded or adjusted to match the headings in the original environmental document reviewed.

Setting/Resource/Circumstance	Change in Affected Environment or Setting		Change in Environmental Impact		Date Reviewed	Highlight Section VI Additional Studies Required or Section IX Attachments
	Yes	No	Yes	No		
Air Quality	☐	☒	☐	☒		
Geologic Resources and Soils	☐	☒	☐	☒		
Water Quality	☐	☒	☐	☒		
Floodplains	☐	☒	☐	☒		
Wetlands/Waters of U.S.	☐	☐	☐	☒		

Vegetation and Noxious Weeds	☐	☒	☐	☒		
Fish and Wildlife	☐	☒	☐	☒		
Threatened/Endangered Species	☐	☒	☐	☒		
Historic Resource (includes bridges)	☐	☒	☐	☒		
Archaeological Resources	☐	☒	☐	☒		
Paleontological Resources	☐	☒	☐	☒		
Land Use	☐	☒	☐	☒		
Social Resources	☐	☒	☐	☒		
Economic Resources	☐	☒	☐	☒		
Environmental Justice	☐	☒	☒	☐		
Residential/Business Right-of-Way Impacts	☒	☐	☒	☐		
Transportation Resources (roadway, rail, bus, bike, pedestrian, etc.)	☐	☒	☐	☒		
Utilities and Railroads	☒	☐	☐	☒		
Section 4(f)/6(f)	☐	☒	☐	☒		
Farmlands	☐	☒	☐	☒		
Noise	☐	☒	☐	☒		
Visual Resources/Aesthetics	☐	☒	☐	☒		
Energy	☐	☒	☐	☒		
Hazardous Materials	☐	☒	☐	☒		
Cumulative Impacts	☐	☒	☐	☒		
Other(s)	☐	☒	☐	☒		

DESIGN ALTERATIONS:
Document changes to project scope and or design criteria:

Detailed description of changes to be inserted at final submission of this form - Minor realignment of I-70 between Brighton Boulevard and Colorado Boulevard, shifting north approximately 45 feet as compared to the Reference Design

REGULATORY CHANGES:
Document changes to laws, regulations, and/or guidelines:

N/A

IMPACTS ASSESSMENT:
For items checked as changed above: assess the affected natural and socio-economic environment, impacts and new issues/concerns which may now exist:

See attached

MITIGATION:

☒ All mitigation commitment(s) from NEPA document remain the same (discuss status and compliance):

☐ Mitigation commitment(s) have changed from NEPA document.

IV. Public/Agency Involvement (optional)

If any, document public meetings, notices, & websites, and/or document agency coordination. For each provide dates, and coordination, where applicable:

Only notification letters to adjacent property owners is anticipated.

V. Additional Studies Required for Proposed Action

VI. Additional Requirements for Proposed Action

- ☐ An SEIS is required, because the changes to the proposed action will result in significant impacts not evaluated in the EIS.
- ☐ An SEIS is required, because new information or circumstances will result in significant environmental impacts not evaluated in the EIS.
- ☐ A revised ROD is required, because an alternative is recommended that was fully evaluated in an approved FEIS but was not identified as the preferred alternative.
- ☐ Appropriate environmental study or an EA is required, because the significance of new impacts is uncertain.
- ☐ A revised FONSI is required, because an alternative is recommended that was fully evaluated in an approved EA but was not identified as the preferred alternative.
- ☐ Other_____
- ☒ None

VII. Permits Updated (optional)

No new permits

VIII. Attachments Listed

List permits, studies, background data, etc.

IMPACTS ASSESSMENT

The following section summarizes anticipated impacts associated with the design alteration discussed previously:

Air Quality

Detailed description of beneficial or neutral impacts of air quality to be inserted at final submission of this form

Geologic Resources and Soils

No additional adverse or beneficial impacts are anticipated.

Water Quality

No additional adverse or beneficial impacts are anticipated.

Floodplains

No additional adverse or beneficial impacts are anticipated.

Wetlands/Waters of U.S.

No additional adverse or beneficial impacts are anticipated.

Vegetation and Noxious Weeds

No additional adverse or beneficial impacts are anticipated.

Fish and Wildlife

No additional adverse or beneficial impacts are anticipated.

Threatened/Endangered Species

No additional adverse or beneficial impacts are anticipated.

Historic Resource (includes bridges)

No additional adverse or beneficial impacts are anticipated.

Archaeological Resources

No additional adverse or beneficial impacts are anticipated.

Paleontological Resources

No additional adverse or beneficial impacts are anticipated.

Land Use

No additional adverse or beneficial impacts are anticipated.

Social Resources

No additional adverse or beneficial impacts are anticipated.

Economic Resources

No additional adverse or beneficial impacts are anticipated.

Environmental Justice

The design change creates a new linear open space along the south side of the I-70 cut section between York and Garfield Streets which can be developed by the City and County as a linear park to enhance community connectivity and provide a new urban open space opportunity in the Elyria and Swansea neighborhoods.

Residential/Business Right-of-Way Impacts

Additional subsurface right-of-way will be required from Lots 17 and 32 of Parcel RW-63 along the southern boundary of Swansea Elementary School in order to accommodate a shift in the I-70 cut section between York and Garfield Streets. This additional right-of-way required will not result in the loss of any functions at Swansea Elementary School or as part of the Partial Cover Park. This shift creates a new linear open space along the south side of the I-70 cut section between York and Garfield Streets which can be developed by the City and County as a linear park to enhance community connectivity in the Elyria and Swansea neighborhoods.

Transportation Resources (roadway, rail, bus, bike, pedestrian, etc.)

No additional adverse or beneficial impacts are anticipated.

Utilities and Railroads

No additional adverse or beneficial impacts are anticipated.

Section 4(f)/6(f)

Mitigation plans for the Swansea Elementary School and associated Partial Cover Park will not change with the design alteration.

Farmlands

No additional adverse or beneficial impacts are anticipated.

Noise

Detailed description of beneficial or neutral impacts of noise to be inserted at final submission of this form

Visual Resources/Aesthetics

No additional adverse or beneficial impacts are anticipated.

Energy

No additional adverse or beneficial impacts are anticipated.

Hazardous Materials

No additional adverse or beneficial impacts are anticipated.

Cumulative Impacts

No additional adverse or beneficial impacts are anticipated.

Other(s)

No additional adverse or beneficial impacts are anticipated.

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 65.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 65.0 has been reviewed by the Procuring Authorities.

The ATC proposes to shift I-70 north between Brighton Boulevard and Colorado Boulevard.

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. conditional approval, subject to modifications and/or conditions, and waiver of requirement for re-submission as a Detailed ATC;

☐ 3. unconditional approval for re-submission as a Detailed ATC;

☒ 4. conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions;

☐ 5. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;

☐ 6. 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

☐ 7. 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 Procuring Authorities have reviewed the Conceptual ATC Submission and have arrived at the above evaluation as identified with the check mark. The Procuring Authorities have coordinated with the City of Denver regarding this ATC. The City of Denver and the Department would like to have Front Range Mobility Group attend a meeting to discuss the concept and answer questions regarding specifics of what is being proposed. The Department is proposing to have the meeting on 1/24/17 from 3:30 to 5 pm at the City of

Denver offices. Please confirm that Front Range Mobility group is able to attend this meeting. In addition, the Procuring Authorities would like the following items addressed in the Detailed ATC submission:

1. Please provide additional information regarding the accommodation of utilities.
2. Please provide additional information regarding the overall highway footprint. Does the footprint change in size?
3. Please provide additional information on the alignment of 46th Avenue South. How much additional space would be created on the south side of the project because of the shift?
4. Please provide additional information regarding any due diligence that Front Range Mobility Group has performed to determine if additional air quality or noise impacts are created by the shift.
5. Please provide an analysis of any traffic impacts or benefits that are created by the shift.
6. Please provide additional information regarding the bookend modifications for 46th on the northeast and northwest corners of the Cover?
7. Please provide additional information on the impact this ATC would have to the Swansea Elementary school layout during construction.
8. Please provide an analysis of the impacts to UPRR structure and trackwork plans if this ATC is implemented.

Central 70

DATE: February 10, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 65.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 65.0 has been reviewed by the Procuring Authorities.

The ATC proposes to shift I-70 north between Brighton Boulevard and Colorado Boulevard.

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. conditional approval, subject to modifications and/or conditions, and waiver of requirement for re-submission as a Detailed ATC;

☐ 3. unconditional approval for re-submission as a Detailed ATC;

☒ 4. conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions;

☐ 5. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;

☐ 6. 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

☐ 7. 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 Procuring Authorities have reviewed the Conceptual ATC Submission and have arrived at the above evaluation as identified with the check mark. The Procuring Authorities have coordinated with the City of Denver regarding this ATC. The Procuring Authorities appreciate Front Range Mobility Group ("FRMG") attending the ATC specific meeting on January 24 at the City of Denver offices. As a result of the meeting, additional comments have been added to the Detailed ATC Submission requirements below.

Items to be addressed in the Detailed ATC submission:

1. Please provide additional information regarding the accommodation of utilities.
2. Please provide additional information regarding the overall highway footprint. Does the footprint change in size?
3. Please provide additional information on the alignment of 46th Avenue South. How much additional space would be created on the south side of the project because of the shift?
4. Please provide additional information regarding any due diligence that FRMG has performed to determine if additional air quality or noise impacts are created by the shift.
5. Please provide an analysis of any traffic impacts or benefits that are created by the shift.
6. Please provide additional information regarding the bookend modifications for 46th on the northeast and northwest corners of the Cover?
7. Please provide additional information on the impact this ATC would have to the Swansea Elementary school layout during construction.
8. Please provide an analysis of the impacts to UPRR structure and trackwork plans if this ATC is implemented.

The following additional items have been added since the initial response to this ATC issued on December 16, 2016

9. There is concern about the operational impacts of moving the Steele Street ramps closer to 45th Ave. It is highly undesirable to operate the 45th Ave. and Steele Street signals as a single signal. Please address options to minimize or eliminate the relocation of the Steele Street ramps.
10. Please indicate any impacts to the southwest and southeast quadrants of the Steele/Vasquez interchange if the ATC is implemented.
11. Please provide additional details to demonstrate that implementation of this ATC does not preclude the second cover (see Paragraph 1.17.a of Section 1 of Schedule 10).
12. The presentation on January 24th provided a plan view plot with a vision for a greenway with sidewalks, trees, etc. Please clearly indicate which of the depicted elements would be included as a part of implementation of this ATC and constructed by FRMG at FRMG's cost.
13. Please outline the process that FRMG would follow regarding getting community input and gaining consensus for the use and features of the additional area on the south side of I-70 that is created if this ATC is implemented.
14. Please outline the process that FRMG would follow regarding additional environmental evaluations that will be required if this ATC is implemented. Also, provide a description of any challenges you foresee, any mitigation strategy FRMG would undertake if necessary, and strategies for implementing a base design if, despite best efforts, FRMG is not able to obtain any required approvals.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 8, 2016

Central 70 Project RFP: ATC Submission No. 65.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

The Central 70 Project is essential to improving mobility along I-70 and reconnecting neighborhoods in the surrounding community. However, the construction of this project means unavoidable impacts to the day to day lives of those who depend on I-70 for transportation needs and who live and work adjacent to the project corridor. Our team understands these concerns, and to address this challenge, FRMG is proposing an ATC to realign I-70 between Brighton Boulevard and Colorado Boulevard, shifting it north as compared to the Reference Design.

This ATC will:

- Reduce the Project Schedule by 6 to 8 months
- Result in Opening all Westbound lanes, including the Tolled Express Lane 12 months earlier
- Maximize Efficiency and Quality during construction and throughout the Project Lifecycle

The ATC allows for nearly full construction of the trench portion of I-70 while maintaining traffic on the existing viaduct, thus resulting in reduced impacts on the community and public, as well as faster, less-segmented construction phasing.

As the Elyria and Swansea neighborhoods are critical community elements and central to the success of the Central 70 Project, FRMG fully appreciates the significant, long-term efforts that have gone into advancing the environmental review process and the IGA with the City and County of Denver. FRMG views the following ATC as precisely aligned with these efforts and with the Procuring Authorities' goals for the Project; it will accelerate the benefits for stakeholders, the traveling public, and particularly the local community. In response to the Procuring Authorities' comments at the September 28, 2016 one-on-one meeting, this ATC preserves all connectivity and access from the Reference Design and includes only one small ROW acquisition to accommodate I-70 in the Lowered Section.

FRMG strongly believes this ATC will minimize impacts to the community both during and after construction, minimize impacts to the traveling public during construction, and maximize efficiency and quality throughout the project lifecycle. This ATC has been drafted with collaborative input from designers, constructors, O&M experts and socio-economic experts who considered the cost and benefits from the perspectives of responsiveness to the community as well as responsible stewardship of taxpayer dollars. Preliminary, verbal input from the Procuring Authorities has been incorporated as well.

The following is an overview of the proposed ATC elements:

Project Commitments	Maintenance of Traffic	Design & Construction
▪ Maintaining the cover structure and park and associated elements as shown in the Reference Design. ▪ Maintaining all connectivity and local access as in the Reference Design.	▪ Greatly simplified maintenance of traffic scheme that keeps traffic on the existing viaduct while the Lowered Section is constructed, resulting in less impact from construction and safer passage through the construction zone. ▪ Allows for greater capacity of 46th Avenue during construction due to greater separation from the excavation activities along the Lowered Section.	▪ Nearly full construction of the Lowered Section in single phase by realigning I-70 to the north , reducing "overlap" with the existing Viaduct structure ▪ Allowing the construction of bridges crossing I-70 in a single phase at Vasquez, Josephine, Columbine, and Clayton Streets. ▪ Simplifying construction of bridges crossing I-70 at York, Monroe, Fillmore, and Cook Streets through reduced conflicts with viaduct columns. ▪ Overhanging a small portion of 46th Avenue North over the westbound lanes of I-70 on either side of the

cover structure.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate the proposed ATC[3].

- Schedule 10, Section 9.4.2.c.ii.A: "The Steele Street/Vasquez Boulevard westbound entrance ramp shall provide a minimum of 750 feet dual ramp meter queuing as measured from the ramp meter stop bar to the cross street."

  This ATC provides approximately 600 feet dual ramp meter queuing.

- Schedule 10, Section 9.4.15.a: "The Developer may use the design exceptions to optimize designs to reduce impacts to adjacent neighborhoods and businesses. Design exceptions 2 and 3 in Table 9-1 are additionally subject to Schedule 18 Section 1.3.2.d Special Provisions for ROW Parcel RW-103 to provide maximum additional buffer space between the highway and residential properties north of I-70 between Brighton Boulevard and Steele Street/Vasquez Boulevard and to Safeway Historic District south of I-70 between Colorado Boulevard and Dahlia Street."

  This ATC reduces impacts to adjacent neighborhoods and business by minimizing the construction duration and impact to the travelling public. Though this ATC shifts the alignment to the north as compared to the Reference Design, we believe the significant reduction in impacts to the adjacent neighborhoods and business during construction and the innovative approach to constructing 46th Avenue is in clear alignment with the overall intent of this requirement. .

- Schedule 10, Section 9, Appendix A Roadway Design Criteria: "Shoulder width requirement for Vasquez Boulevard WB Entrance Ramp is 8 feet."

  This ATC provides 8 feet of shoulder for approximately 300 feet of ramp. The remainder of the ramp will be constructed with a 6 foot shoulder width.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

As stated in the ATC overview, FRMG supports the vision of the corridor and seeks to further build on the Procuring Authorities' efforts in advancing the environmental review process and the IGA. This ATC will lead to earlier realization of the benefits of this project to for local community and the traveling public. To re-emphasize our rationale for this ATC, the realignment of I-70 between Brighton Boulevard and Colorado Boulevard to the north will result in the following benefits for key stakeholders as outlined in the table below.

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

Table ATC-1.

	Direct Benefits for:		
	CDOT	Elyria and Swansea Community	Traveling Public
Overall ATC Results:	*Maximized efficiency and quality throughout the project lifecycle*	*Minimized impacts to the community both during and after construction*	*Minimized impacts to the traveling public during construction*
ATC Proposal Elements			
Full construction of the Lowered Section in a single phase by realigning I-70 to the north of the Reference Design	▪Faster, less-segmented construction phasing reducing the project schedule by 6 to 8 months ▪One year earlier opening of westbound lanes including the Tolled Express Lane ▪Reduced costs through shortened schedule ▪Construction of the Vasquez, Josephine, Columbine, and Clayton structures in a single phase ▪Simplified phasing of the York, Cook, Fillmore, and Monroe structures ▪Streamlined efficiency with fewer interfaces during construction (less coordination required for vendors/subs) ▪Increased consistency, continuity, and quality in un-interrupted delivery ▪Improved Safety	▪Reduced community impacts from construction, including traffic disruption, dust and equipment air emissions, noise, and general inconvenience ▪Reduced pressure on local roads and detour routes ▪Improved Safety ▪Shorter duration to endure construction	▪Improved Safety ▪Simplified traffic control ▪Fewer lane shifts and traffic pattern changes ▪Less reduction in the capacity of 46th Avenue during construction ▪Reduced travel time with minimzed lane closures and detours ▪Significantly reduced risk of accidents with construction separated from existing highway

ALIGNMENT WITH THE PROJECT GOALS:

This ATC clearly aligns with the Procuring Authorities' project goals and as outlined in the following table, provides the Procuring Authorities with an option to realize these goals faster. While FRMG understands the challenges that the Project creates along the I-70 Corridor, including the impacts to the Elyria and Swansea Neighborhood, this ATC supports all existing goals and provides an option to accelerate and ease the impacts of construction, benefiting all impacted parties as shown in Table ATC-2 below.

Table ATC-2.

This ATC is aligned with all Project Goals and further proposed to accelerate construction through full construction of the depressed trench section while maintaining traffic on the existing viaduct.

Project Goals	Alignment (Y or N)	ATC Key Benefits in Alignment with Goals
1. Optimize the scope of the transportation and supporting infrastructure delivered through the Project in order to promote corridor-wide economic and community vitality.	☑ Yes	▪Meets the needs of the neighborhood with the best use of taxpayer dollars ▪This ATC promotes corridor-wide economic and community vitality
2. Optimize operating and life cycle maintenance costs by delivering a Project using quality design, materials and techniques.	☑ Yes	▪Increases consistency and quality in single-phase delivery ▪Maximizes efficiency in project approach (streamlined

		coordination) ▪ No negative impact to O&M
3. Minimize impacts to the traveling public, businesses and nearby communities during and after construction.	☑ Yes	▪ Reduces impact by maintaining existing lanes and speeds ▪ Reduces pressure on local roads and detour routes ▪ No rerouting means no negative impact to local business
4. Once operational, ensure reliable travel speeds in the managed lanes and, for all lanes, a minimum appropriate standard of maintenance.	☑ Yes	▪ This ATC will maintain the goals of reliable travel speeds and efficient maintenance regimes in line with the Reference Design.
5. Utilize a collaborative process to enhance community values and Project benefits.	☑ Yes	▪ ATC drafted from collaborative input from designers, constructors, O&M experts and socio-economic experts ▪ Together, considered both environmental and community issues and responsible stewardship of taxpayer dollars
6. Protect the safety of the workforce and public.	☑ Yes	▪ Increases safety of workforce in physical construction separation from ongoing traffic ▪ Increases safety of public with fewer lane shifts and maintaining existing traffic pattern

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

The following Table ATC-3 provides a preliminary impact analysis associated with implementation of this ATC. The analysis takes into consideration the potential change in impacts when compared to the impact conclusions in the FEIS. The analysis also shows that this ATC is not expected to have negative environmental effects, and in fact, that it will have beneficial or similar environmental and social/economic impact to the Reference Design.

Because this ATC will result in a significant reduction in construction duration (an estimated reduction of 6 to 8 months). Impacts that are linked to the duration of construction, such as traffic disruption, construction noise and air quality particulate emissions would be reduced generating beneficial effects.

This ATC will require a small strip of additional ROW (Lots 17 and 32 of Parcel RW-63) for subsurface use (Lowered Section of I-70) at the Swansea Elementary School where I-70 will be shifted to the north in its Lowered Section location. There will be no loss of function or impact to the school.

Table ATC-3.

EIS Categories not expected to be impacted or result in Positive impacts by this ATC

Environmental Category	Explanation
Social and Economic Conditions	The reduction in construction duration would have a corresponding positive effect on temporary road closures and traffic detours, as well as reducing impacts associated with access to businesses and public services.
Visual resources & aesthetic qualities	Negative visual effects would not be expected as a result of implementing the subject ATC. The project will be designed in accordance with the Aesthetic and Design Guidelines established for the project.
Parks and recreational resources	No additional effects to parks and recreation as a result of implementing this ATC.
Air Quality	The conclusions provided in the FEIS show that the cover contributes to improved air quality when compared to future conditions without the cover. Preliminary CO and PM air quality analysis supporting the subject ATC show negligible increases in PM concentrations during operations. Based on the construction schedule being reduced as a result of the ATC, construction generated air pollutant emissions would be significantly reduced. Adverse air quality effects would not be expected as a result

	of implementing the subject ATC.
Energy	Significant energy consumption differences are not expected as a result of the subject ATC. A shorter construction schedule would be expected to reduce overall energy consumption.
Noise	According to the FEIS, the cover reduces noise impacts in the adjacent area. Preliminary noise emission modeling supporting the subject ATC show negligible increases in noise levels at sensitive receptors. Based on the construction schedule being reduced as a result of the ATC, the duration of construction generated noise impacts would be significantly reduced. Adverse noise effects would not be expected as a result of implementing the subject ATC.
Section 4(f) and Section 6(f)-Recreation Resources	No additional effects on Section 4(f) or 6(f) resources are expected. No net change in available parkland would result from this ATC.
Traffic	This ATC will lead to simplified traffic control with fewer lane shifts and traffic pattern changes. This will result in reduced travel time with no lane closures and minimized detours. Improved safety is expected since construction will be separated from the existing highway for a longer duration.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

A full cost/benefit analysis that will be performed as part of a detailed ATC will reveal significant cost savings due to the streamlined schedule and ability to construct the vast majority of the Lowered Section in a single phase. This ATC will also accelerate the opening of the Tolled Express Lanes, which means earlier revenue collection for HPTE and the Project. In addition to the direct cost benefits and savings, there are several intangible benefits to the welfare and social considerations of the community with the shortened schedule, as well for the traveling public and their safety and satisfaction. Ultimately this ATC would benefit those living and commuting in the Elyria and Swansea Neighborhood as well as the Greater Denver Area.

Our initial estimate is that this ATC will result in approximately **$35 million in savings** to the Base MPP over the term of the Project.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

A detailed schedule analysis will clearly show the benefits and positive impacts of this ATC as FRMG can accomplish even more than the baseline and planned quality work with fewer phases, consistent delivery, and streamlined efforts that might otherwise be spent coordinating smaller portions of the work. An initial assessment based on this ATC and the ability to accelerate and combine phases could potentially result in an overall schedule savings of **6 to 8 months**.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

The attached exhibits illustrate a plan layout of this ATC and representative cross sections. Attachment A shows the existing viaduct in purple, the covered section in orange, and the portion of 46th Avenue that would be constructed over I-70, supported by straddle bents at key locations in red. It should be noted that adjacent to the bridge crossings of I-70, the straddle bents will be incorporated into the bridge crossings for an integrated appearance with the bridges. Attachment B shows a typical section through

the cover at the Swansea Elementary School. Attachment C shows a typical section between bridge crossings.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

This is an optimization specific to the Central 70 Project.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

N/A

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

N/A

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

N/A

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

N/A

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

N/A

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

N/A

Attachment A
Design Exceptions

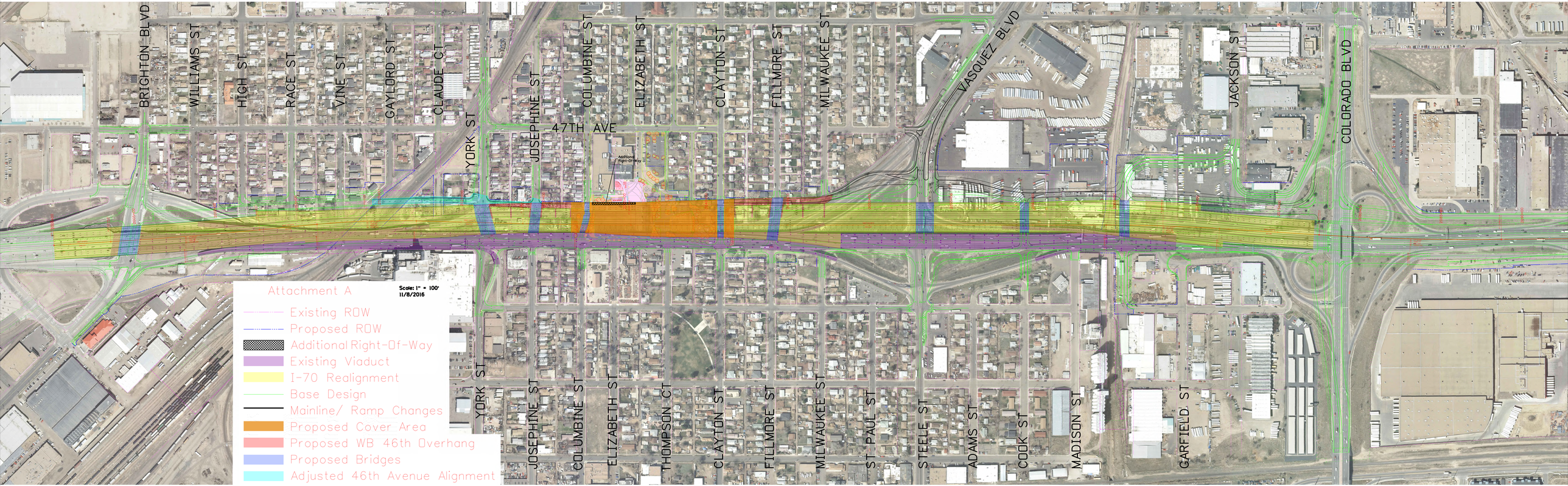
No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

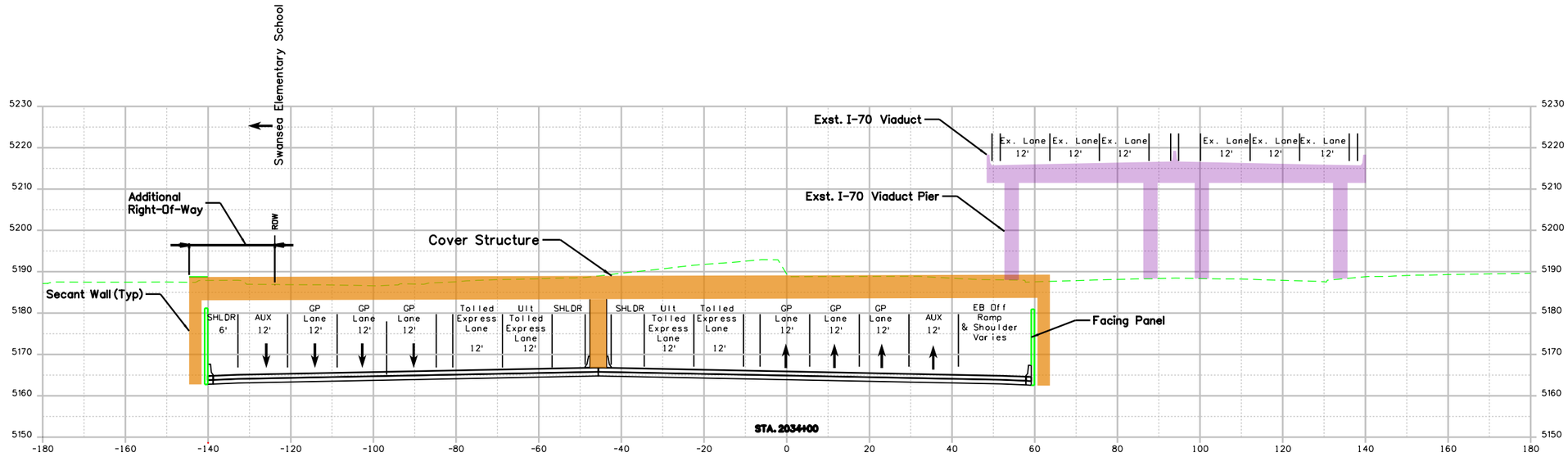
ATC SUBMISSION No. 65.0

CONCEPTUAL DRAWINGS

Front Range Mobility Group



CONFIDENTIAL



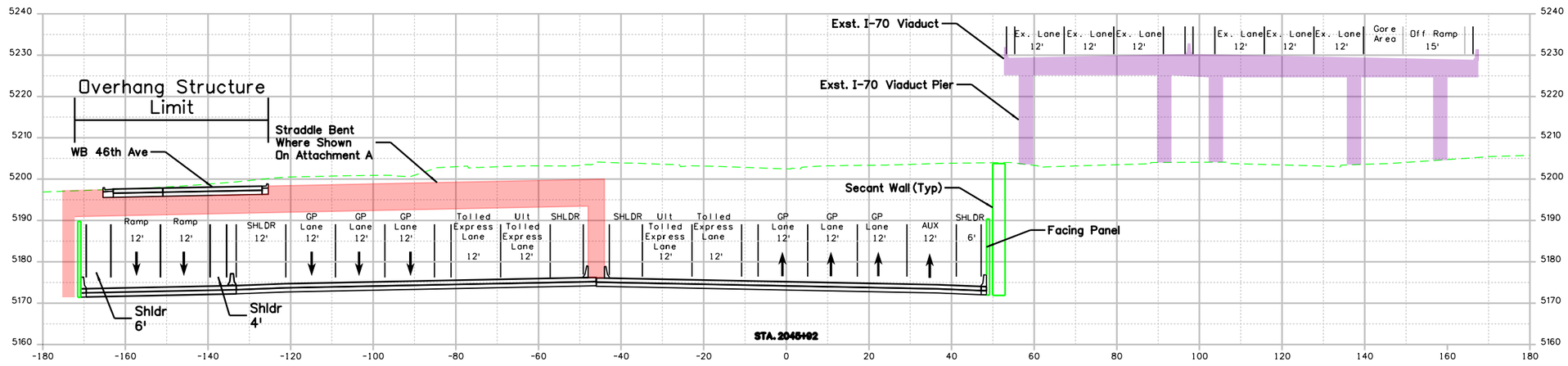
Cross Section at Swansea Elementary School

ATC - 65

Print Date: 11/4/2016		Sheet Revisions			Colorado Department of Transportation	As Constructed	ATTACHMENT B CENTRAL 70	Project No./Code
File Name: 13599DES_Model_Area1_ATC_65.dgn		Date:	Comments	Init.	2000 South Holly Street Denver, CO 80222 Phone: 303-757-9934 FAX: 303-757-9907	No Revisions:		
Front Range Mobility Group	Horiz. Scale: 1:30 _					Revised:	Designer:	Structure Numbers
	Vert. Scale: _ _						Detailer:	
	Unit Information					Void:	Sheet Subset:	Subset Sheets: of
	Unit Leader				Region 1 KJS			Sheet Number

ATC SUBMITTAL

CONFIDENTIAL



Cross Section Between Clayton Street & Vasquez Boulevard

ATC - 65

Print Date: 11/4/2016		0000	Sheet Revisions			Colorado Department of Transportation	As Constructed	ATTACHMENT C CENTRAL 70		Project No./Code
File Name: 13599DES_Model_Area1_ATC_65.dgn			Date:	Comments	Init.	2000 South Holly Street Denver, CO 80222 Phone: 303-757-9934 FAX: 303-757-9907	No Revisions:			
Front Range Mobility Group	Horiz. Scale: 1:30.0001						Revised:	Designer:	Structure Numbers	
	Vert. Scale: _ _							Detailer:		
	Unit Information						Void:	Sheet Subset:	Subset Sheets: of	Sheet Number
	Unit Leader					Region 1 KJS				

ATC SUBMITTAL

CONFIDENTIAL

ATC 67

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 67

Central 70

DATE: March 17, 2017

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 67.1

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 67.1 has been reviewed by the Procuring Authorities.

Detailed ATC 67.1 requests the use of 1000W-equivalent LED luminaire fixtures for median lighting on 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).

☐ 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 FRMG in this ATC is not approved by Xcel. FRMG shall be responsible for getting approval from Xcel to maintain the proposed fixtures. If Xcel is unwilling to maintain the proposed fixtures, FRMG 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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: March 8, 2017

Central 70 Project RFP: ATC Submission No. 67.1[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☐ None (initial submission of ATC)

☒ Previously Submitted as Conceptual ATC

☐ Previously Submitted as Detailed ATC

3. Explanation of Reason for Resubmission

Excel Energy will be performing maintenance of the I-70 median lighting. The proposed 1000W-equivalent LED luminaire is not currently approved by Xcel Energy and they will not maintain the fixture until it is approved. As such, during delivery of the Project, FRMG will:

Obtain approval from Xcel Energy to use the proposed 1000W-equivalent LED luminaire fixture and obtain written confirmation from Xcel Energy that they will maintain the fixture;

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

☐ Meeting Requested

☒ Meeting Not Requested[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

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

This ATC requests the use of 1000W-equivalent LED luminaire fixtures for median lighting on the I-70 Mainline. This requires an exception to the Xcel Energy standard materials list or adoption of the proposed luminaire as an approved fixture. The current Project Agreement requirement is to use lighting equipment as currently specified by CDOT or Xcel Energy.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

"This information has not been amended since the submission of the conceptual version of this ATC."

Schedule 10, Section 11.7.2.paragraph a, states, "The Developer shall use lighting equipment for all permanent installations as specified in the CDOT *Standard Specifications* or by Xcel Energy as applicable"

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

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

The current 400W-equivalent LED fixture on Xcel Energy's standard list will require close (240') spacing of median poles on I-70 to meet the minimum prescribed illumination levels in the Project corridor.

The rationale for this ATC is to achieve median lighting levels throughout the I-70 corridor, except for the Cover section, while minimizing the number of poles and light fixtures and supporting the Project's goal to use LED fixtures. CDOT is focused on improving energy efficiency and reducing electrical power consumption. The use of LED lighting fixtures is one element of the overall program.

High performance LED fixtures are relatively new and not yet widely used by Xcel Energy. Xcel Energy currently has an approved 400W-equivalent LED luminaire fixture for roadway lighting installations. They have an approved 1000W HPS luminaire for mid-mast roadway lighting applications, but they have yet to approve a similar 1000W-equivalent LED luminaire fixture.

Use of 1000W-equivalent LED luminaires will better meet the intent of mid-mast median lighting on I-70 by providing the desired lighting level while reducing the number of poles and fixtures by one-third. This will result in lower construction costs and fewer items in the median to maintain.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

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

This ATC would have no adverse environmental, social, economic, community, traffic or safety impacts. The proposed 1000W-equivalent LED luminaires would use about 45% less electrical power than required for 1000W HPS luminaires.

Acceptance of a 1000W-equivalent LED luminaire by CDOT would require FRMG to obtain approval from Xcel Energy for a fixture that is not currently on their standard materials list, and an agreement from Xcel

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

Energy to assume maintenance of the proposed fixtures;

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

"This information has not been amended since the submission of the conceptual version of this ATC."

FRMG anticipates a CapEx savings of $250,000 as a result of implementation of this ATC

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

"This information has not been amended since the submission of the conceptual version of this ATC."

No design schedule impacts are anticipated with approval of this ATC. Construction time would be reduced by two months for installation of fewer luminaires for the I-70 median lighting system.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

"This information has not been amended since the submission of the conceptual version of this ATC."

A catalog cut of a representative 1000W-equivalent LED pole mounted luminaire is attached for information.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

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

CDOT has a specification for LED lighting (Revision of Sections 613 and 715 LED Roadway Luminaire) but has limited experience with its use on median roadway lighting projects. LED lighting was recently installed in the I-70 Twin Tunnels and is being evaluated. Other jurisdictions, such as the City of Los Angeles have used LED lighting extensively and the "Kansas Highway LED Illumination Manual: A Guide for the Use of LED Lighting Systems" includes use of 1000W-equivalent LED luminaires. .

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

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

As requested by the Procuring Authorities, during delivery of the Project, FRMG will obtain approval from Xcel Energy to use the proposed 1000W-equivalent LED luminaire fixture and obtain written confirmation from Xcel Energy that they will maintain the fixture.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

If the proposed 1000W-equivalent LED luminaire fixture is not approved for use and maintenance by Xcel Energy, then FRMG will revert to a lighting fixture (and associated additional poles) that is currently approved by Xcel Energy.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

No changes to Handback procedures or requirements are anticipated. The luminaires handed back would be 1000W-equivalent LED fixtures rather than currently approved lighting fixtures.

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

No additional right-of-way is needed

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

During delivery of the Project, FRMG will obtain approval from Xcel Energy to use the proposed 1000W-equivalent LED luminaire fixture along with written confirmation from Xcel Energy that they will maintain the proposed fixture.

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

No changes to RFP requirements are needed. Addition of the proposed 1000W-equivalent LED luminaire fixture to Xcel Energy's list of approved fixtures is needed.

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

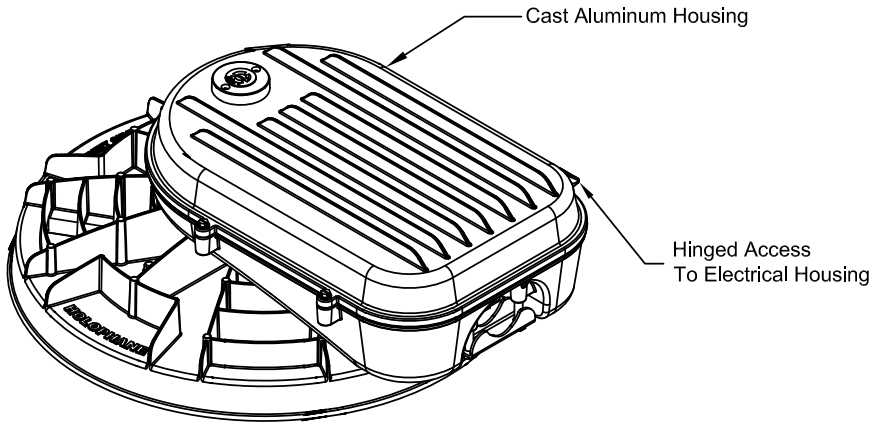
ATC SUBMISSION No. 67.1

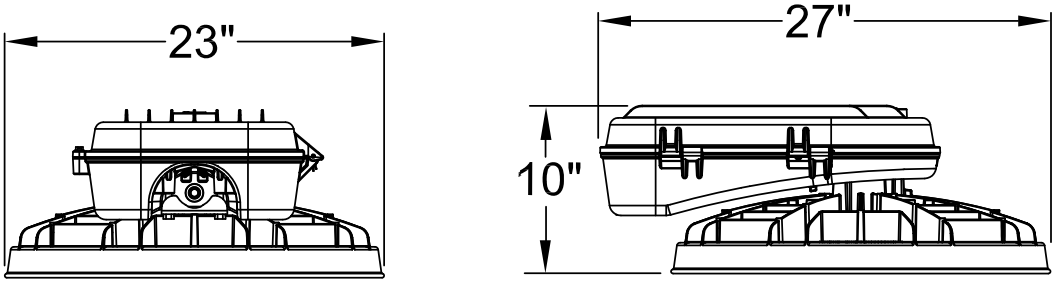
ATTACHMENTS

HMLED2™ LED High Mast Lighting

Infrastructure Specialty

Weight = 52lbs
EPA =1.30 sq. ft
UL1598, 40C, Wet location





ORDERING INFORMATION:

HMLED2

Series	Number of LED Modules	Color Temperature	Voltage
HMLED2	06 = 06 Modules 09 = 09 Modules 12 = 12 Modules	3K = 3,000K CCT +/-250K 4K = 4,000K CCT +/-250K 5K = 5,000K CCT +/-250K	AS = Auto-Sensing Voltage (120 - 277 V) AH = Auto-Sensing Voltage (347 - 480 V)

Housing Color	Optical	Options	Accessories
A = As Specified G = Gray H = Graphite K = Black Z = Bronze W =White	M = Medium, Asymmetric N= Narrow, Asymmetric F = Forward Throw, Asymmetric AN = Area Narrow AW = Area Wide	AO = Field Adjustable Output DM = 0-10v Dimming FD1 = Single Fusible Disconnect FD2 = Double Fusible Disconnect P3 = 3 Pin NEMA Receptacle P5 = 5 Pin NEMA Receptacle P7 = 7 Pin NEMA Receptacle PCSS = DTL Solid-State Lighting Photocontol 120-277V PCL1 = DTL DLL Photocontrol for 120-277V PCL3 = DTL Twist-off Photocontrol for 347V PCL4 = DTL Twist-off Photocontrol for 480V PSC= Shorting Cap	F1 = Single Fusing Accessory F2 = Double Fusing Accessory HMLED2D90 = 90 Degree Shield HMLED2D120 = 120 Degree Shield HMLED2D180 = 180 Degree Shield

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	6/23/16
DWG #:	LUM_HMLED2

Specifications

General Construction

Rugged die cast, low copper content aluminum 380 alloy electrical and optical housing are polyester powder coated with super durable paint for durability and corrosion resistance. Rigorous pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber (per ASTM B117). Four bolt horizontal arm mount with +/- 5 degree vertical adjustment provides 3G vibration rating per ANSI C136. Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8"). Two captive bolts disengage top electrical cover for easy access to LED drivers, surge protection, and terminal block. IP66 rated LED modules, IP65 electrical assembly per IEC60068-2-3. Luminaire is UL 1598 safety listed to 40C, wet locations. Luminaire electrical and optical housing ship complete in one carton facilitating installation and minimizing carton disposal at jobsite.

Electrical

Quick disconnect connectors for ease of installation and maintenance. Surge protection meets 10KV/5KA per ANSI/IEEEC62.41. Driver meets maximum total harmonic distortion (THD) of 20% and is ROHS compliant. A three stage terminal block is standard for ease of installation. Minimum operating temperature is -40C.

Optical

Multi die LED chip on board (COB) technology, Color temperature options of 4000K and 5000K with CRI of 70 minimum. Borosilicate prismatic glass optics ensure longevity and minimize dirt depreciation. Zero uplight optics reduce sky glow and meets Dark Sky requirements. Prismatic glass optics provide overlapping pattern on application space eliminating dark spots. Prismatic glass optics minimize direct view of LED, reducing glare. Rotatable optic assembly provides alignment of asymmetric distributions to roadway.

Controls

Controls options include the **P3, P5, and P7** locking style photocontrol receptacles. The P5 and P7 receptacle options are factory pre-wired to dimming leads of drivers.

PCSS - Premium solid state locking style photocontrol (10 year rated life)

PCL1 - Extreme long life solid state locking-style photocontrol (20 year rated life)

Field Adjustable Output (AO) module - An onboard device that adjusts the light output and input wattage to meet site specific requirements, allowing a single fixture configuration to be flexibly applied in many different applications. The AO module is pre-set at the factory to position number 8.

Operating Characteristics (AN Optics)

LED Qty	CCT	Lumens	Input Watts	LPW	Input Amps						L83 @ 25C	Driver Life @ 25C
					120V	208V	240V	277V	347V	480V		
6	4000K	31,419	252	125	2.10	1.20	1.00	0.90	0.70	0.50	100,000 hrs	>100,000 hrs
9	4000K	46,675	376	124	3.10	1.80	1.60	1.40	1.10	0.80		
12	4000K	60,990	500	122	4.10	2.40	2.10	1.80	1.40	1.00		

Testing Compliance

See Holophane HMAO-LED Validation Test Specification - Luminaire conforms to following standards: ANSI/IEEE C62.41:2002 - Surge protection. ANSI C82.77:2002 - Harmonic distortion. ANSIC136.31:2001- Luminaire vibration. ASTM B 117:2003 - Salt spray test. FCC title 47 CFR Part 18 - Federal Communications Commission. IEC 60068 - Environmental testing. IEC 60529:1999 - Degrees of protection provided by enclosure (IP)IEC 61000 - Electromagnetic Compatibility testing (EMC). IEEE 519 - Harmonic control in Electrical Power systems. UL-1598, 40C, Wet Location - Safety listing.

Manufacturing

Manufactured in Crawfordsville, Indiana. ARRA compliant. Test 100% electrical of all luminaires before shipment. No less than five (5) years experience in manufacturing LED- based products.

Warranty

Five Year Limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note

Actual performance may differ as a result of end-user environment and application.
Actual wattage may differ by +/- 8% when operating between 120-480V +/-10%.
Specifications subject to change without notice.

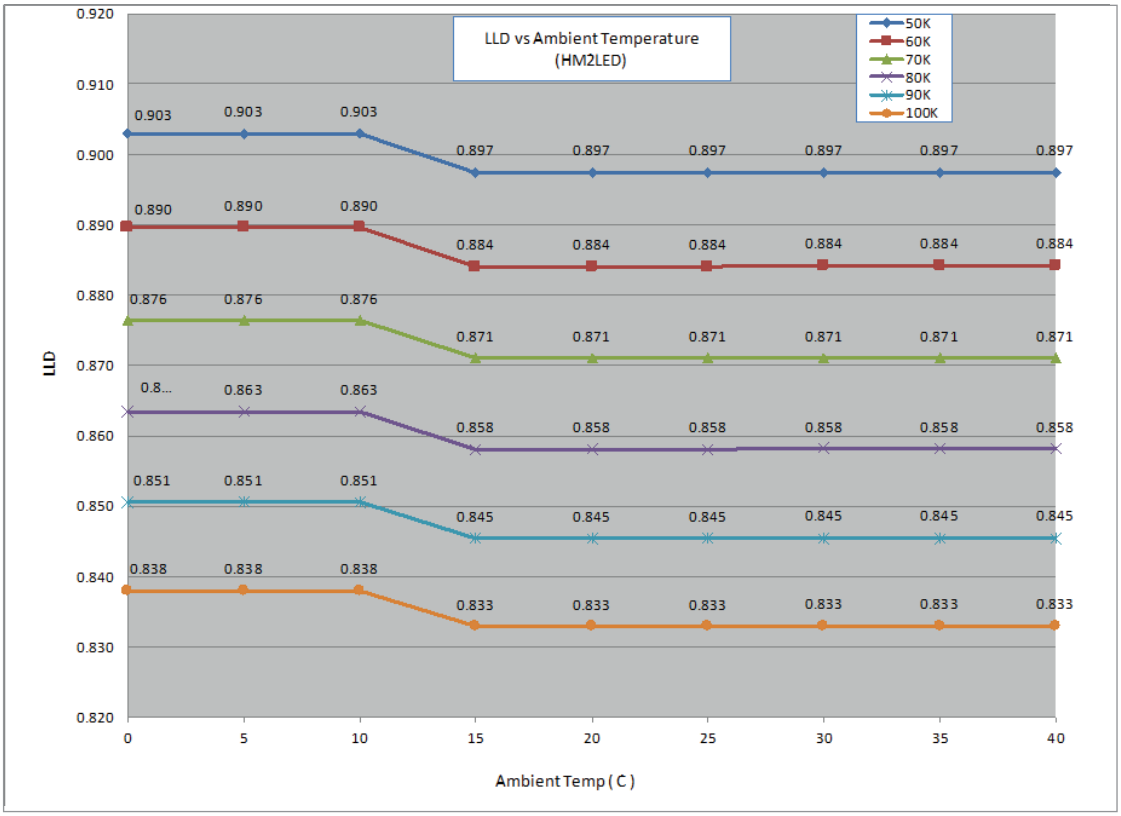
HMLED2™
LED High Mast Lighting

Infrastructure Specialty

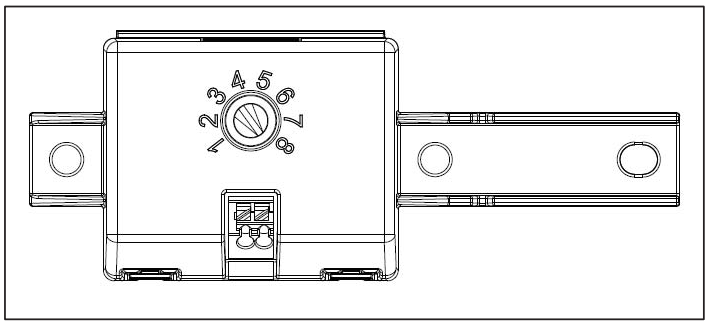
HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

ORDER #:
TYPE:
DRAWN: BGW
DATE: 6/23/16
DWG #: LUM_HMLED2

Lumen Depreciation Chart



The Field Adjustable Output (AO) module



Configuration	AO Position	Lumens %	Wattage %
HMLED2-06,09,12	8	100%	100%
HMLED2-06,09,12	7	100%	100%
HMLED2-06,09,12	6	100%	100%
HMLED2-06,09,12	5	90%	85%
HMLED2-06,09,12	4	80%	73%
HMLED2-06,09,12	3	68%	60%
HMLED2-06,09,12	2	57%	49%
HMLED2-06,09,12	1	41%	34%

HMLED2™
LED High Mast Lighting

Infrastructure Specialty

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

ORDER #:
TYPE:
DRAWN: BGW
DATE: 6/23/16
DWG #: LUM_HMLED2

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 67.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 67.0 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 Conceptual ATC. The ATC requests the use of 1000W-equivalent LED luminaire fixtures for median lighting on 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 Conceptual ATC:

☐ 1. unconditional approval and waiver of requirement for re-submission as a Detailed ATC;

☐ 2. conditional approval, subject to modifications and/or conditions, and waiver of requirement for re-submission as a Detailed ATC;

☐ 3. unconditional approval for re-submission as a Detailed ATC;

☒ 4. conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions;

☐ 5. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;

☐ 6. 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

☐ 7. 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 Conceptual ATC Submission. The ATC is conditionally approved. The Procuring Authorities understand that the proposed luminaire fixture is not currently approved by Xcel Energy and they will not maintain the fixture. Xcel Energy will be performing the maintenance on the I-70 median

lighting. As such, during delivery of the Project the Developer shall obtain approval from Xcel Energy to use the proposed luminaire fixture and written confirmation from Xcel Energy that they will maintain the fixture.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 8, 2016

Central 70 Project RFP: ATC Submission No. 67.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

This ATC requests the use of 1000W-equivalent LED luminaire fixtures for median lighting on the I-70 Mainline. This requires an exception to the Xcel standard materials list. The current requirement is to use lighting equipment as currently specified by CDOT or Xcel Energy.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

Schedule 10, Section 11.7.2.paragraph a, states, "The Developer shall use lighting equipment for all permanent installations as specified in the CDOT *Standard Specifications* or by Xcel Energy as applicable"

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

The current 400W-equivalent LED fixture on Xcel's standard list will require close (240') spacing of median poles on I-70 to meet the minimum prescribed illumination levels.

The rationale for this ATC is to achieve median lighting levels throughout the I-70 corridor, except for the Cover section, while minimizing the number of poles and light fixtures and supporting the Project's goal to use LED fixtures.

High performance LED fixtures are relatively new and not yet widely used by Xcel Energy. Xcel currently has an approved 400W-equivalent LED fixture for roadway lighting installations. They have an approved 1000W HPS luminaire for mid-mast roadway lighting applications, but do not have a similar 1000W-equivalent LED fixture approved..

Use of 1000W-equivalent LED fixtures will better meet the intent of mid-mast median lighting on I-70 by providing more a uniform lighting level while reducing the number of poles and fixtures by one-third. This will result in lower construction costs and fewer items in the median to maintain.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

This ATC would have no adverse environmental, social, economic, community, traffic or safety impacts

Acceptance of a 1000W-equivalent LED luminaire would require an exception to Xcel's standard materials list, including agreement to maintain the fixtures.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

FRMG anticipates a CapEx and O&M savings of $250,000 as a result of implementation of this ATC

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

No design schedule impacts are anticipated with approval of this ATC. Construction time would be reduced by two months for installation of the median lighting system.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

A catalog cut of a representative 1000W-equivalent LED pole mounted luminaire is attached for information.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

CDOT recently prepared a specification for LED lighting but may not yet have much experience with its use on roadway projects. Other jurisdictions, such as the City of Los Angeles have used LED lighting extensively and Kansas DOT recently published "Kansas Highway LED Illumination Manual: A Guide for the Use of LED Lighting Systems".

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

N/A

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

If alternative fixture is not made a standard by Xcel then the JV (not Xcel) will need to meter and maintain these fixtures

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

Not applicable

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

Not applicable

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

Not applicable

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

Not applicable

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

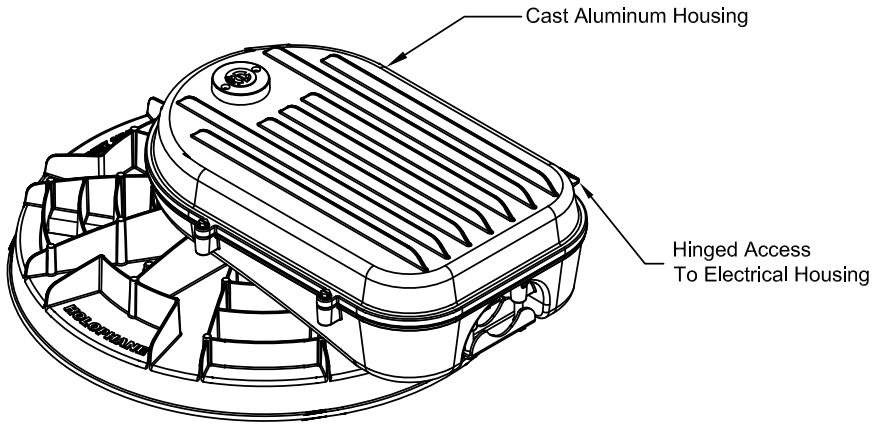
ATC SUBMISSION No. 67.0

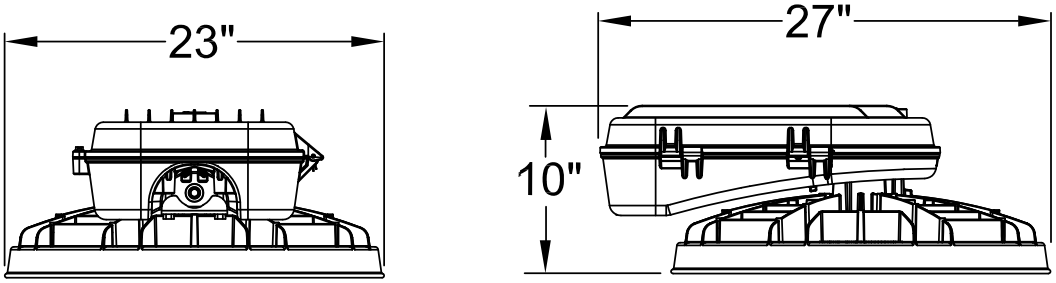
SUPPORT INFORMATION

HMLED2™ LED High Mast Lighting

Infrastructure Specialty

Weight = 52lbs
EPA =1.30 sq. ft
UL1598, 40C, Wet location





ORDERING INFORMATION:

HMLED2

Series	Number of LED Modules	Color Temperature	Voltage
HMLED2	06 = 06 Modules 09 = 09 Modules 12 = 12 Modules	3K = 3,000K CCT +/-250K 4K = 4,000K CCT +/-250K 5K = 5,000K CCT +/-250K	AS = Auto-Sensing Voltage (120 - 277 V) AH = Auto-Sensing Voltage (347 - 480 V)

Housing Color	Optical	Options	Accessories
A = As Specified G = Gray H = Graphite K = Black Z = Bronze W =White	M = Medium, Asymmetric N= Narrow, Asymmetric F = Forward Throw, Asymmetric AN = Area Narrow AW = Area Wide	AO = Field Adjustable Output DM = 0-10v Dimming FD1 = Single Fusible Disconnect FD2 = Double Fusible Disconnect P3 = 3 Pin NEMA Receptacle P5 = 5 Pin NEMA Receptacle P7 = 7 Pin NEMA Receptacle PCSS = DTL Solid-State Lighting Photocontol 120-277V PCL1 = DTL DLL Photocontrol for 120-277V PCL3 = DTL Twist-off Photocontrol for 347V PCL4 = DTL Twist-off Photocontrol for 480V PSC= Shorting Cap	F1 = Single Fusing Accessory F2 = Double Fusing Accessory HMLED2D90 = 90 Degree Shield HMLED2D120 = 120 Degree Shield HMLED2D180 = 180 Degree Shield

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	6/23/16
DWG #:	LUM_HMLED2

Specifications

General Construction

Rugged die cast, low copper content aluminum 380 alloy electrical and optical housing are polyester powder coated with super durable paint for durability and corrosion resistance. Rigorous pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber (per ASTM B117). Four bolt horizontal arm mount with +/- 5 degree vertical adjustment provides 3G vibration rating per ANSI C136. Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8"). Two captive bolts disengage top electrical cover for easy access to LED drivers, surge protection, and terminal block. IP66 rated LED modules, IP65 electrical assembly per IEC60068-2-3. Luminaire is UL 1598 safety listed to 40C, wet locations. Luminaire electrical and optical housing ship complete in one carton facilitating installation and minimizing carton disposal at jobsite.

Electrical

Quick disconnect connectors for ease of installation and maintenance. Surge protection meets 10KV/5KA per ANSI/IEEEC62.41. Driver meets maximum total harmonic distortion (THD) of 20% and is ROHS compliant. A three stage terminal block is standard for ease of installation. Minimum operating temperature is -40C.

Optical

Multi die LED chip on board (COB) technology, Color temperature options of 4000K and 5000K with CRI of 70 minimum. Borosilicate prismatic glass optics ensure longevity and minimize dirt depreciation. Zero uplight optics reduce sky glow and meets Dark Sky requirements. Prismatic glass optics provide overlapping pattern on application space eliminating dark spots. Prismatic glass optics minimize direct view of LED, reducing glare. Rotatable optic assembly provides alignment of asymmetric distributions to roadway.

Controls

Controls options include the **P3, P5, and P7** locking style photocontrol receptacles. The P5 and P7 receptacle options are factory pre-wired to dimming leads of drivers.

PCSS - Premium solid state locking style photocontrol (10 year rated life)

PCL1 - Extreme long life solid state locking-style photocontrol (20 year rated life)

Field Adjustable Output (AO) module - An onboard device that adjusts the light output and input wattage to meet site specific requirements, allowing a single fixture configuration to be flexibly applied in many different applications. The AO module is pre-set at the factory to position number 8.

Operating Characteristics (AN Optics)

LED Qty	CCT	Lumens	Input Watts	LPW	Input Amps						L83 @ 25C	Driver Life @ 25C
					120V	208V	240V	277V	347V	480V		
6	4000K	31,419	252	125	2.10	1.20	1.00	0.90	0.70	0.50	100,000 hrs	>100,000 hrs
9	4000K	46,675	376	124	3.10	1.80	1.60	1.40	1.10	0.80		
12	4000K	60,990	500	122	4.10	2.40	2.10	1.80	1.40	1.00		

Testing Compliance

See Holophane HMAO-LED Validation Test Specification - Luminaire conforms to following standards: ANSI/IEEE C62.41:2002 - Surge protection. ANSI C82.77:2002 - Harmonic distortion. ANSIC136.31:2001- Luminaire vibration. ASTM B 117:2003 - Salt spray test. FCC title 47 CFR Part 18 - Federal Communications Commission. IEC 60068 - Environmental testing. IEC 60529:1999 - Degrees of protection provided by enclosure (IP)IEC 61000 - Electromagnetic Compatibility testing (EMC). IEEE 519 - Harmonic control in Electrical Power systems. UL-1598, 40C, Wet Location - Safety listing.

Manufacturing

Manufactured in Crawfordsville, Indiana. ARRA compliant. Test 100% electrical of all luminaires before shipment. No less than five (5) years experience in manufacturing LED- based products.

Warranty

Five Year Limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note

Actual performance may differ as a result of end-user environment and application.
Actual wattage may differ by +/- 8% when operating between 120-480V +/-10%.
Specifications subject to change without notice.

HMLED2™
LED High Mast Lighting

Infrastructure Specialty

HOLOPHANE®
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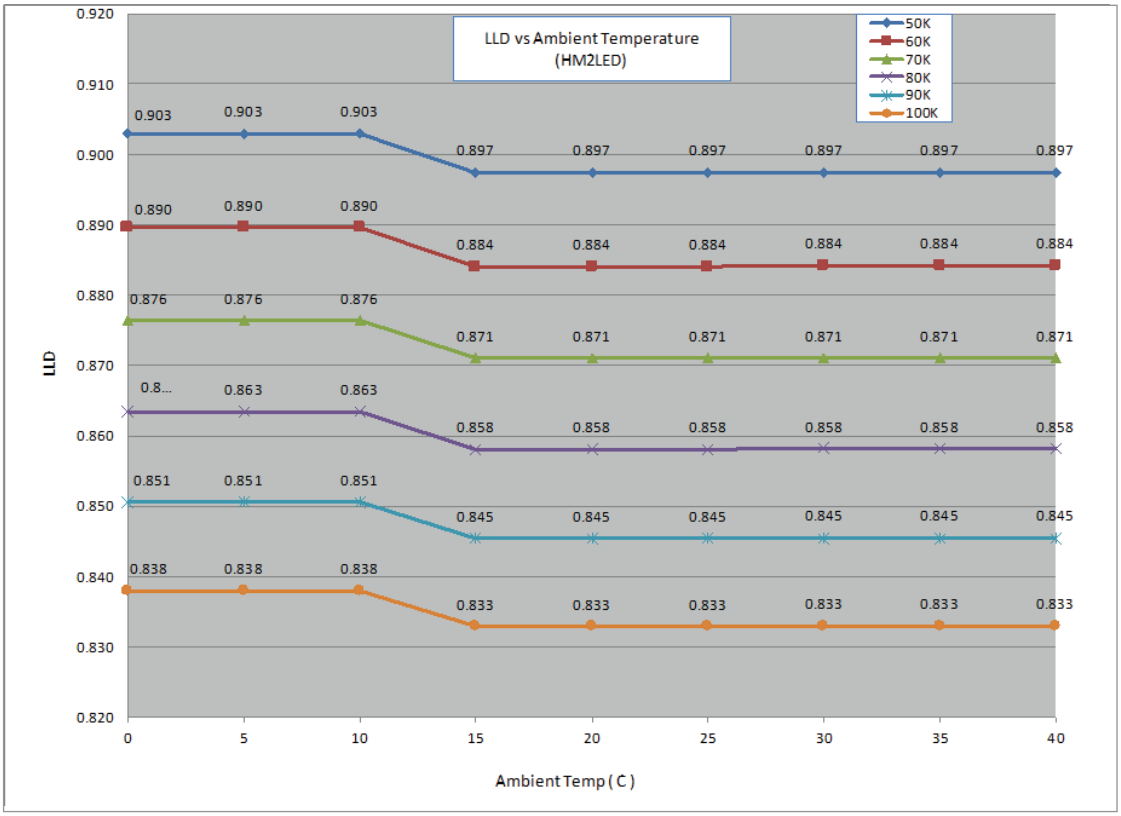
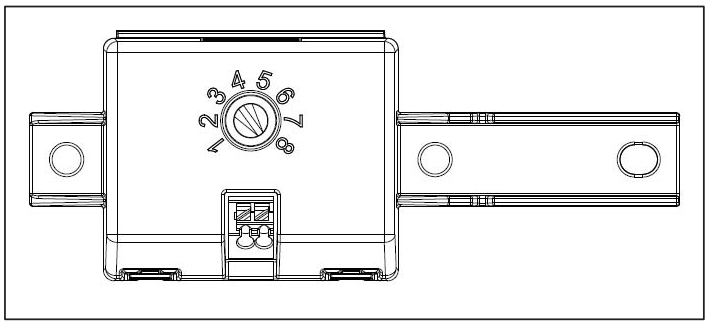
ORDER #:
TYPE:
DRAWN: BGW
DATE: 6/23/16
DWG #: LUM_HMLED2

Lumen Depreciation Chart



The Field Adjustable Output (AO) module



Configuration	AO Position	Lumens %	Wattage %
HMLED2-06,09,12	8	100%	100%
HMLED2-06,09,12	7	100%	100%
HMLED2-06,09,12	6	100%	100%
HMLED2-06,09,12	5	90%	85%
HMLED2-06,09,12	4	80%	73%
HMLED2-06,09,12	3	68%	60%
HMLED2-06,09,12	2	57%	49%
HMLED2-06,09,12	1	41%	34%

HMLED2™
LED High Mast Lighting

Infrastructure Specialty

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An AcuityBrandsCompany

ORDER #:
TYPE:
DRAWN: BGW
DATE: 6/23/16
DWG #: LUM_HMLED2

ATC 69

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 69

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 69.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 69.0 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 Conceptual ATC. The ATC proposes to allow the LED driver to be integral with the light fixtures required in the Cover MEP 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 Conceptual ATC:

☒ 1. unconditional approval and waiver of requirement for re-submission as a Detailed ATC;

☐ 2. conditional approval, subject to modifications and/or conditions, and waiver of requirement for re-submission as a Detailed ATC;

☐ 3. unconditional approval for re-submission as a Detailed ATC;

☐ 4. conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions;

☐ 5. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;

☐ 6. 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

☐ 7. 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 Conceptual ATC Submission. The ATC is unconditionally approved.

The approval of this Conceptual 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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 8, 2016

Central 70 Project RFP: ATC Submission No. 69.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

This ATC proposes to modify the Cover lighting system requirement that drivers for the LED fixtures be housed in a fire rated enclosure, separate from the light fixture. Approval of this ATC would allow the LED driver to be integral with the light fixture.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

Addendum 5, Schedule 10, Section 12, paragraph 12.19.6.f states: "The fixtures shall consist only of the LEDs and their optical lens housed within a sealed IP66 enclosure capable of being pressure hosed. The fixtures are to be connected to the electrical distribution panels (EDP)s via specially constructed cables that have IP66 connectors. The EDPs are to house the LED drivers in fire rated enclosures."

This ATC proposes to modify the Schedule 10, Section 12 requirement to allow a fire proof enclosure to tap the power circuit, with a direct connection to the integral driver/LED light fixture. In the event of a fire, the integrity of the power circuit would be maintained, while the integral fixture (driver and LED light) and its connection would be sacrificed. This meets the intent of NFPA 502, Chapter 12.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

The current Schedule 10, Section 12, paragraph 12.19.6.f requirement appears to be focused on protecting and maintaining the electrical power system and the LED drivers during a fire event within the tunnel. However, the LED light fixture would be destroyed during a fire event which would require its replacement. FRMG's rationale for requesting approval of this ATC includes:

- LED drivers create a significant amount of heat so the EDP boxes housing them would require substantial heat dissipation measures to ensure long term reliability of the drivers. Even so, it is expected that the drivers' life would be reduced and they would fail at an accelerated rate due to higher operating temperatures, resulting in higher maintenance costs.

- Optimal efficiency is obtained when the LED light fixture and its driver are fully compatible. Incremental product improvements in lighting fixtures will reduce the compatibility of newer LED lights with older version drivers. Over time, it is likely that drivers would have to be replaced when a LED light fixture is replaced to maintain compatibility. Replacement would be easier, and take less time, if the driver and light fixture were integral and would allow upgrades to more energy efficient fixture/driver products saving energy and reducing the carbon footprint of the project.

- FRMG is required to operate and maintain the tunnel lighting system for 30 years. During this period, it is very likely that LED light fixtures and their drivers will evolve significantly. Rather than maintaining current technology for 30 years, it would be better to plan on replacing integral

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

light/driver units as necessary over time to continually advance the entire lighting system.

- To maintain separately housed LED drivers over a 30 year period would require the development of a sophisticated system to track which driver was connected to which LED light fixture. Over time, the EDPs would contain a variety of driver units of various vintages. Extreme care would be required to ensure that every replacement light fixture was compatible with the associated remote driver unit. This would not be an issue with integral driver/light fixtures.

- The dual use of the westbound bore of the tunnel during construction of the eastbound bore requires the temporary installation of a significant number of lighting units for eastbound tunnel entry. As the eastbound bore is opened to permanent traffic, the temporary lights can be removed much more easily if they are integral driver/light fixtures. The integral light fixtures could either be relocated to the eastbound bore as part of initial construction or be placed into stores and made available as replacement units to facilitate long term maintenance of the tunnel lighting system.

- Electrical power conduits for the tunnel lighting system are required to be fire proof so that the lighting circuit would survive a fire. With integral driver/light fixtures, a fire proof tap box would be used to provide power to the LED lights, while maintaining the integrity of the power circuit in event of a fire. In a post-fire situation, new integral driver/light fixtures could quickly be installed and connected to the surviving power circuit.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

This ATC would have no adverse environmental, social, economic, community, traffic, safety or third party impacts. Use of integral LED light/driver units would result in lower initial costs, greater reliability, higher operating efficiency, lower maintenance costs and shorter traffic disruption periods for replacements.

Approval of this ATC would reduce the complexity of the tunnel lighting system by using standard off the shelf equipment. There would be no need for custom light fixtures, special heat dissipating boxes or other non-standard equipment. This would reduce initial construction costs, require fewer spare parts and reduce maintenance costs. Necessary maintenance activities would require shorter lane closures, with less delay and reduced risks to the traveling public.

As newer integral LED light fixture/driver units were installed during routine maintenance activities the overall tunnel lighting system would be incrementally upgraded over the 30 year maintenance period. This would result in lower power consumption and better conditions at Handback.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

With approval of this ATC, initial installation costs of the Cover lighting system would be reduced due to lower equipment cost and increased installation efficiency. Operations and maintenance costs would be lower because driver failure rates would be reduced, less time would be required for replacement of fixtures and power requirements would be lower as LED technology improves. Overall, FRMG anticipates a total CapEx and O&M savings of $2.5M as a result of implementation of this ATC.

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

No design schedule impacts are anticipated with approval of this ATC. Construction time for the Cover lighting system would be reduced by off-site prefabrication of mounting rack units that contained integral driver/light fixtures. The rack units would be installed in long sections with only simple connections to the power circuit. Overall, as much as eight weeks of installation time could be saved with integral driver/light fixtures.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

N/A

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

CDOT recently used integral driver/LED light fixtures on the Twin Tunnels project near Idaho Springs. Similar tunnel projects in other States are also successfully using this technology.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

N/A

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

n/a

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

n/a

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

n/a

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

n/a

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

n/a

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC 70

Front Range
Mobility Group

THE EXTRA MILE

CONNECTING COMMUNITIES

ATC 70

Central 70

DATE: December 16, 2016

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Conceptual Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 70.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Conceptual ATC 70.0 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 Conceptual ATC. The ATC proposes to use a Cable Management System (CMS) for the Cover MEP System that uses phenolic based conduits and fittings that meet the requirements of NFPA 502.

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. conditional approval, subject to modifications and/or conditions, and waiver of requirement for re-submission as a Detailed ATC;

☐ 3. unconditional approval for re-submission as a Detailed ATC;

☐ 4. conditional approval for re-submission as a Detailed ATC, subject to modifications and/or conditions;

☐ 5. disapproval, with or without guidance that such ATC can be re-submitted under any circumstance;

☐ 6. 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

☐ 7. 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 Conceptual ATC Submission. The ATC is unconditionally approved.

The approval of this Conceptual 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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: November 8, 2016

Central 70 Project RFP: ATC Submission No. 70.0[1]

A. Background Information

1. Type of Submission

☒ Conceptual ATC

☐ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

This ATC proposes to use a Cable Management System (CMS) for the Covered Section that uses phenolic based conduits and fittings that meet the requirements of NFPA 502.

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3]*.*

Addendum 5, Schedule 10, Section 12, paragraph 12.3.2 states, "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".

Paragraph 12.5.2 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."

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

Addendum 5, Schedule 12, Section 12, paragraph 12.2.1 states, "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."

Section 12.3.1 states, "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."

The current requirement for stainless steel appears to be focused on fire safety and the corrosive environment that will exist within the Cover. It is intended to require material with sufficient fire resistance and durability to survive the environment over its design life.

NFPA 502, paragraph 12.1.2 states, "Emergency circuits installed in a road tunnel and ancillary areas shall remain functional for a period of not less than 1 hour for the anticipated fire condition, meeting one of the following methods: (1) A fire-resistive cable listed for 2 hours in accordance with ANSI/UL 2196 or other equivalent internationally recognized standards to 950°C (1742°F) when approved by the AHJ. (2) Circuits embedded in concrete or protected by a 2-hour fire barrier system in accordance with UL 1724. The cables or conductors shall be thermoset and shall be suitable to maintain functionality at the temperature within the embedded conduit or fire barrier system."

FRMG's rationale for requesting approval of this ATC includes:

- Stainless steel conduit is expensive to purchase and labor intensive to install.
- Stainless steel fittings are not always weather tight upon installation. Over time, fittings can work loose as the conduits expand and contract.
- A phenolic-based CMS system, including low smoke/zero halogen conductors, will provide a power distribution system that fully meets the intent of NFPA 502, paragraph 12.1.2 and UL2196.

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

- Phenolic material is more weather tight and less subject to temperature induced movements than stainless steel and therefore is easier to maintain and to repair, resulting in lower long term maintenance costs.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

This ATC would have no adverse environmental, social, economic, community, traffic, safety, operations or third party impacts.

Approval of this ATC would reduce the overall cost of the electrical CMS system installed in the tunnel. This includes overall power distribution, lighting circuits and ITS circuiting. A phenolic based system would have lower maintenance requirements and would be in better condition at Handback than a stainless steel system.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

FRMG anticipates a CapEx of $1.0M as a result of implementation of this ATC

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

There is no impact to the design schedule with this ATC, however about one month can be saved in construction time for the Cover electrical system by using a phenolic-base CMS system.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

N/A

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been implemented, regardless of the results, and the relevance of such experience.

Tunnel projects within CDOT jurisdictions may not have not utilized phenolic conduit systems; however, similar roadway tunnel projects in other states, such as the Midtown Tunnel in Norfolk and Portsmouth, VA, have successfully used this material.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

N/A

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

n/a

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

n/a

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

n/a

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

n/a

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

n/a

Attachment A
Design Exceptions

No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.					
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC 74

Front Range
Mobility Group

CONNECTING COMMUNITIES

ATC 74

Central 70

DATE: March 3, 2017

TO: Front Range Mobility Group

FROM: Anthony DeVito P.E. Central 70 Project Director
Nicholas Farber, Central 70 Project

SUBJECT: Central 70 - Detailed Alternative Technical Concept (ATC) Response
Front Range Mobility Group - ATC No. 74.0

Dear Mr. Friedrich:

Your Team's ATC Submission Form for Detailed ATC 74.0 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 74.0 proposes to route the flows from the sanitary sewer in York Street along the south side of the 46th Ave alignment to 44th Street, then north under I-70 and west to connect to the existing Delgany Interceptor.

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 February 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. Front Range Mobility Group shall:

a. be responsible for any additional Environmental Approvals required for the ATC;
b. be responsible to obtain any Additional Right-of-Row required for the ATC;
c. be responsible to obtain any required Railroad Permits required for the ATC; and
d. be responsible to obtain any other Permit or approval required from any Governmental Authority, Utility Owner, or other third party (including Denver Wastewater and Metro Wastewater). Denver Wastewater preliminarily reviewed this ATC and their main concern was regarding the location of the manholes. Manholes will not be allowed in detention ponds.

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.

ANNEX 3: ALTERNATIVE TECHNICAL CONCEPT SUBMISSION FORM

Proposer Name: Front Range Mobility Group
Date: January 20, 2017

Central 70 Project RFP: ATC Submission No. 74.0[1]

A. Background Information

1. Type of Submission

☐ Conceptual ATC

☒ Detailed ATC

2. Prior Submission(s)

☒ 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[2]

[1] Proposers to complete in accordance with instruction (2) to the Annex.
[2] In accordance with Section 3.2.1 of Part C, the Procuring Authorities may nevertheless require a Proposer to present an ATC Submission at a One-on-One Meeting.

B. General ATC Submission Requirements

1. Overview Description

Narrative overview description of the proposed ATC.

We propose to eliminate the Sanitary Sewer crossing of I-70 and proposed structure MISC-E-17-IU located adjacent to York Street. The ATC is based on information provided in the one-on-one meeting where Denver Wastewater indicated that it would entertain a change to the storm and sanitary crossings adjacent to York Street. This ATC proposes to route the flows from the sanitary sewer in York Street to along the south side of 46th Avenue alignment to 44th St. then north under I-70 and then west to the Delgany Interceptor (Metro Wastewater collection system) approximately 4,150 linear feet to the west of York Street (see attached plan and profiles).

2. Relevant RFP Requirements

List all material RFP requirements that are inconsistent with, and would require amendment to accommodate, the proposed ATC[3].

The reference drawings identified a plan showing the existing sanitary sewer crossing form the south side of I-70 to the north and continuing north outside the project limits.

- Schedule 10, Section 13.5.2 Table 13-2 identifies MISC-E-17-IT as a required new bridge structure included in the project.

3. Rationale

Explanation of how, where and why the ATC would be used on the Project, including how it aligns with the Project Goals.

The ATC supports the Project Goals of optimizing the scope of the transportation and supporting infrastructure delivered through the Project in order to promote corridor wide economic and community vitality. It will provide an equivalent level of service, by conveying offsite flows across the project area; it will minimize initial cost associated with the structure construction; reduce long-term maintenance costs associated with the structure, and increase safety due to the elimination of a center pier for the span.

The ATC supports the intent of the Reference Drawings by providing a conveyance path for the sanitary sewer to the Delgany Interceptor. Additionally, it supports the Project Goal of optimizing scope of the transportation and supporting infrastructure delivered through the project in order to promote corridor wide economic and community vitality.

This ATC will minimize initial cost to the Project, reduce the construction schedule, remove an additional structure crossing I-70, eliminate long term maintenance associated with that structure, and increase safety due to the elimination of a center pier for the utility bridge crossing I-70.

4. Impacts

A preliminary analysis of potential environmental, social, economic, community, traffic, safety, operations

[3] Proposers are not required to propose RFP drafting amendments when completing Part B, but are required to do so when completing Section 5 of Part C.

and maintenance or third party impacts (positive and negative), including specific separate identification and analysis of any such impacts that are not reflected in the final EIS.

We have reviewed the National Western Center Master Plan and the proposed alignment does not conflict with any of the proposed improvements. We do not anticipate any negative impacts to the Project associated with the approval of this alternative solution.

5. Cost and Benefit Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely costs, and savings, that are likely to result from implementation of such ATC, including reference to assumptions on which such estimate is based.

This ATC involves installation of roughly 4,150 Feet of sewer main, by both open cut and trenchless methods. This is a net increase in pipeline installation of roughly 3,750 lf, with a proportionate increase in cost. This increase of cost is offset by savings achieved from elimination of the proposed structure MISC-E-17-IT crossing I-70. The elimination of this structure allows the roadway profile in the trench to be raised by up to 7 feet. The savings to the project include reduced structure costs due to elimination of the sewer bridge and reduced trench retaining wall heights, reduced earthwork costs due to a raised roadway profile, and reduced trench drainage and outfall costs due to a raised roadway profile.

FRMG anticipates a savings of $900,000 associated with the components of this ATC as follows:

Cost Saving Items

Elimination of Structure MISC-E-17-IT crossing I-70 – $300,000

Reduction in Retaining Walls -- $600,000

Reduction in Earthwork -- $2,900,000

Sewer Line Work -- $600,000

Additional Cost Items

Microtunnel -- $3,500,000

6. Schedule Analysis

An estimate (which in the case of a Conceptual ATC can be limited to an order of magnitude) of likely design and construction time period impacts (positive and negative) of such ATC, including reference to assumptions on which such estimate is based.

This ATC does not affect the critical path, therefore there is not a schedule saving to the overall project.

7. Conceptual Drawings

At Proposer's discretion, unless otherwise requested by the Procuring Authorities, conceptual drawings.

See attached.

8. Past Use

Identification of other projects on which the ATC (or a substantially similar approach) has been

implemented, regardless of the results, and the relevance of such experience.

Numerous sanitary sewer lines were re-routed in the Narrows portion of the I-25 TRex project.

9. Additional Information

With respect to previously submitted ATC Submissions only, additional information as requested by the Procuring Authorities following review of such prior submissions.

n/a.

C. Detailed ATC Requirements

1. Risks

To the extent not otherwise addressed by the responses to Part B above, an analysis of any additional risks to the Procuring Authorities, CDOT, the State or third parties associated with implementation of the ATC, including discussion of how such risks are, or are proposed to be, allocated under the terms of the Project Agreement.

FRMG has analyzed this ATC from a risk perspective and believes that there are no risks associated with the elimination of Structure MISC-E-17-IT.

2. Handback

Description of any proposed changes in handback procedures and/or the Handback Requirements associated with the ATC, if any are expected.

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

3. Right-of-Way

A description, estimated cost and proposed procurement schedule of any Additional Right-of-Way expected to be required to implement the ATC, if any.

No additional ROW is anticipated for this ATC

4. List of Required Approvals

A list of required, or likely to be required, third party and Governmental Approvals, including any Design Exceptions (which should be summarized in the form of Attachment A (Design Exceptions)).

Approvals will be required from the following entities;

City and County of Denver Wastewater Division for revised route and pipe sizing

Metro Wastewater Reclamation District for connection to the Delgany Interceptor

5. Proposed Drafting Revisions

(a) List all RFP requirements that are inconsistent with the proposed ATC and (b) attach in the form of a mark-up (for amendments to existing drafting) and/or a rider (with respect to newly proposed drafting) proposed revisions to address those inconsistencies.

Table 13-2 Actions for bridge structures

Existing Structure No.	New Structure No.	Structure Location and Description	Action
E-17-UY	E-17-AEU	I-70 westbound over Brighton Boulevard	Removal and reconstruction
E-17-US	E-17-AEV	I-70 eastbound over Brighton Boulevard	Removal and reconstruction
E-17-FX	N/A	I-70 Viaduct (Brighton Boulevard to Colorado Boulevard)	Removal
E-17-Z	N/A	UPRR Bridge under I-70	Removal
N/A	E-17-AEW	UPRR over I-70	New construction
	E-17-AEX	UPRR Service Road over I-70	New construction

~~N/A~~	~~MISC-E-17-IT~~	~~Sanitary Sewer Bridge over I-70 (at York Street)~~	~~New construction~~
N/A	E-17-AEY	York Street over I-70	New construction
N/A	MISC-E-17-IU	Storm Sewer Bridge over I-70 (at York Street)	New construction
N/A	E-17-AEZ	Josephine Street over I-70	New construction
N/A	E-17-AEL	Cover (Columbine to Clayton)	New construction
N/A	E-17-AEN	Fillmore Street over I-70	New construction
N/A	E-17-AEO	Steele Street over I-70	New construction
N/A	E-17-AEP	Cook Street over I-70	New construction
N/A	E-17-AFA	BNSF Market Lead over I-70	New construction
N/A	E-17-AFC	Monroe Street over I-70	New construction
E-17-HU E-17-HT	E-17-AFD	Colorado Boulevard over I-70	Removal and reconstruction
E-17-HY	E-17-AFF	I-70 westbound over Dahlia Street	Removal and reconstruction
E-17-HZ	E-17-AFG	I-70 eastbound over Dahlia Street	Removal and reconstruction
E-17-HW	E-17-AFH	I-70 westbound over Holly Street	Removal and reconstruction
E-17-HX	E-17-AFI	I-70 eastbound over Holly Street	Removal and reconstruction
E-17-GC	E-17-AFJ	I-70 westbound over Monaco Street	Removal and reconstruction
E-17-GD	E-17-AFK	I-70 eastbound over Monaco Street	Removal and reconstruction
N/A	E-17-ADT	N Stapleton Drive over Denver Rock Island Railroad	Removal and reconstruction
E-17-EW	E-17-AFN	I-70 westbound over Denver Rock Island Railroad	Removal and reconstruction
E-17-DF	E-17-AFO	I-70 eastbound over Denver Rock Island Railroad	Removal and reconstruction
N/A	E-17-ADU	Quebec eastbound exit ramp over Denver Rock Island Railroad	New construction
E-17-GA	E-17-AFQ	I-70 westbound over Quebec Street	Removal and reconstruction
E-17-GB	E-17-AFR	I-70 eastbound over Quebec Street	Removal and reconstruction
E-17-AER	N/A	I-70 over Sand Creek	Existing bridge previously constructed
E-17-KR	E-17-AFS	Eastbound I-270 over I-70	Removal and reconstruction
E-17-VD	N/A	I-70 over Havana Street	Bridge constructed under Havana Design Build Project
E-17-VE	N/A	I-70 over UPRR spur track (near Havana Street)	Bridge constructed under Havana Design Build Project
E-17-IQ	E-17-AFT	I-70 westbound over Peoria Street	Removal and reconstruction
	E-17-AFU	I-70 eastbound over Peoria Street	Removal and reconstruction

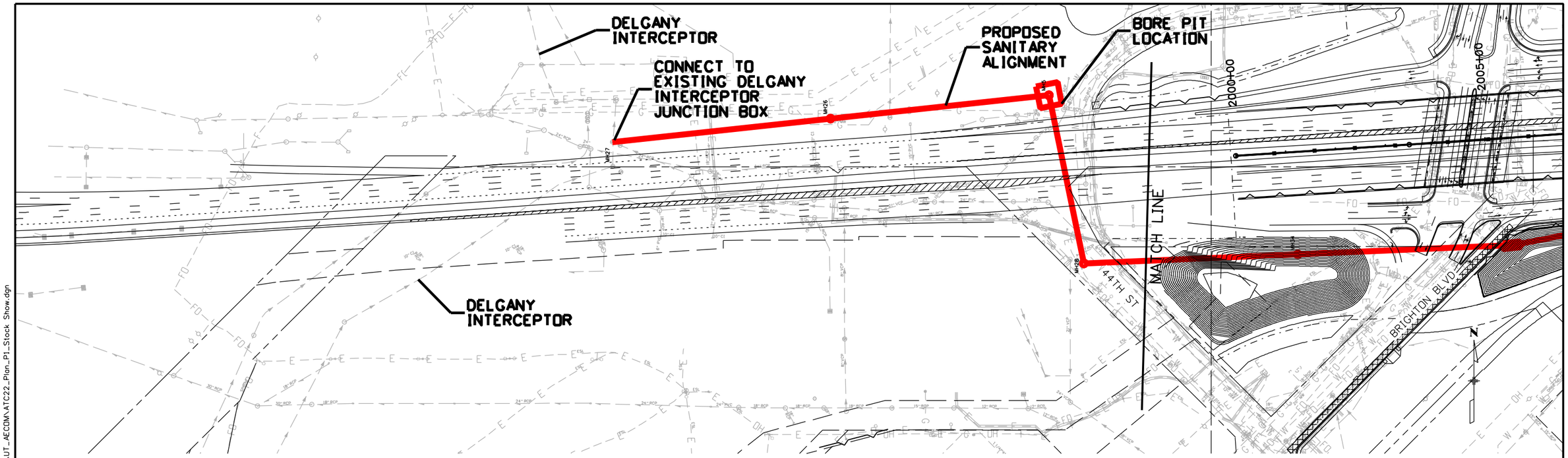
Attachment A
Design Exceptions

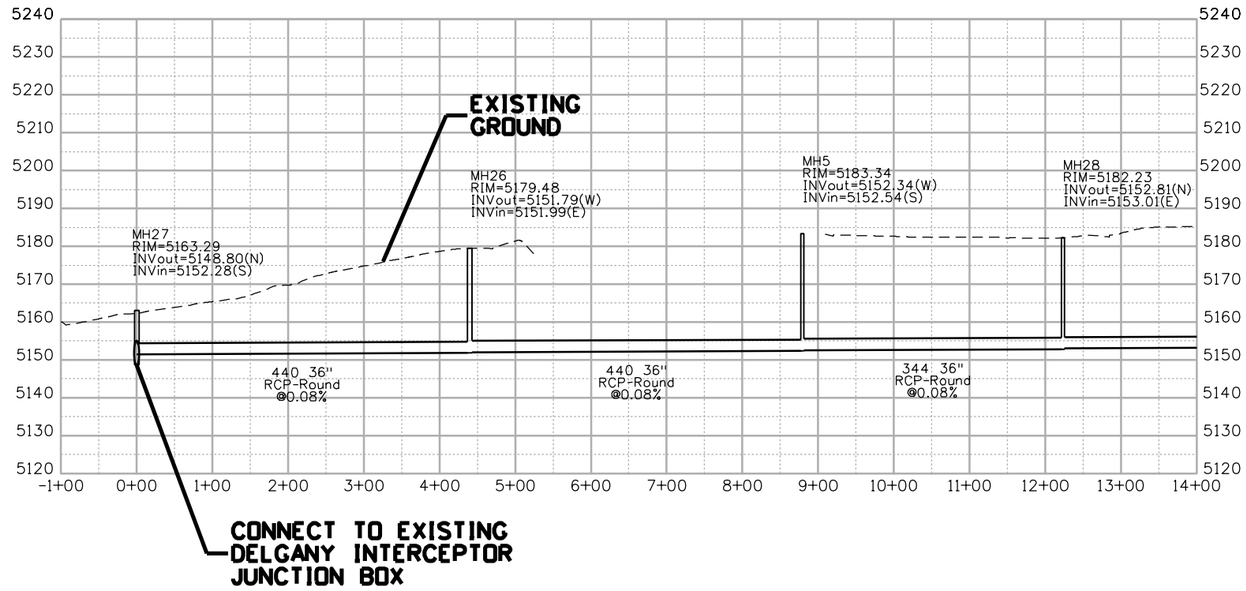
No.	RFP Reference	Existing Condition and Applicable Standard (verbatim from standard)	Proposed Condition[4]	Procuring Authorities' Response[5]	FHWA Response[6]
1.	Schedule 10 Sec 13.5.2 Table 13.2	MISC-E-17-IT shown as a new bridge	~~MISC-E-17-IT~~ removed from Table 13-2		
2.					

[4] Proposers should include in this column or attach to the relevant ATC Submission Form the information referred to in Section 9.4.15.b.ii of Schedule 10 (*Design and Construction Requirements*) to the Project Agreement.
[5] For Procuring Authorities' use only.
[6] For FHWA use only.

ATC SUBMISSION No. 74.0

CONCEPTUAL DRAWINGS





Print Date: 1/4/2017
File Name: ATC22_Plan_P1_Stock Show.dgn
Horiz. Scale: 1:200
Vert. Scale:
Unit Information
Unit Leader

Front Range Mobility Group

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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

As Constructed
No Revisions:
Revised:
Void:

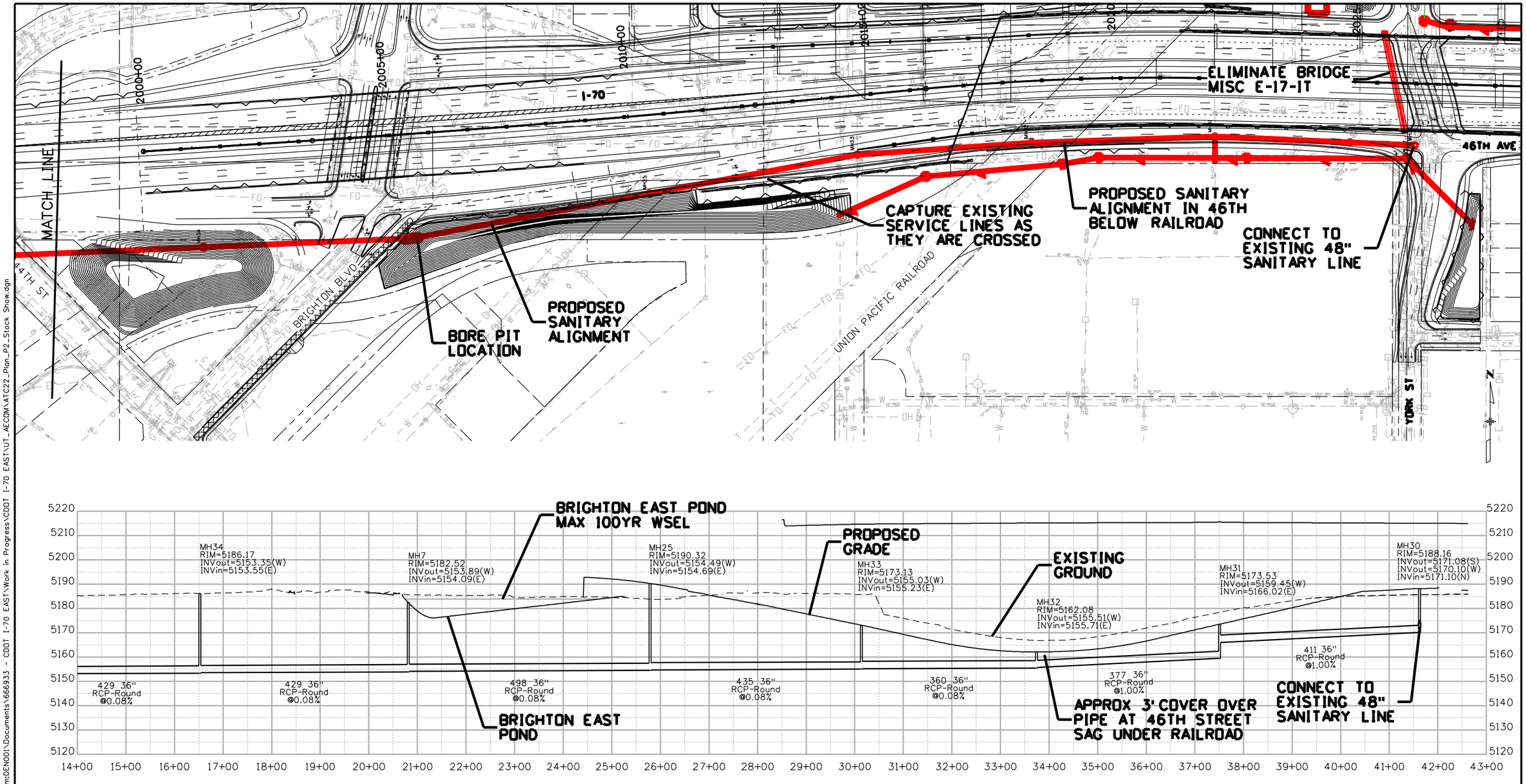
ATTACHMENT A
SANITARY SEWER

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets: of

Project No./Code

Sheet Number 1 OF 2

ATC SUBMITTAL



Print Date: 1/4/2017			Sheet Revisions			Colorado Department of Transportation	As Constructed	ATTACHMENT A SANITARY SEWER		Project No./Code
File Name: ATC22_Plan_P2_Stock Show.dgn			Date:	Comments	Init.	2000 South Holly Street Denver, CO 80222 Phone: 303-757-9934 FAX: 303-757-9907	No Revisions:			
Front Range Mobility Group	Horiz. Scale: 1:200	0000					Revised:	Designer:	Structure Numbers	
	Vert. Scale:							Detailer:		
	Unit Information					Region 1 KJS	Void:	Sheet Subset:	Subset Sheets: of	Sheet Number 2 OF 2
	Unit Leader									

ATC SUBMITTAL

Front Range
Mobility Group

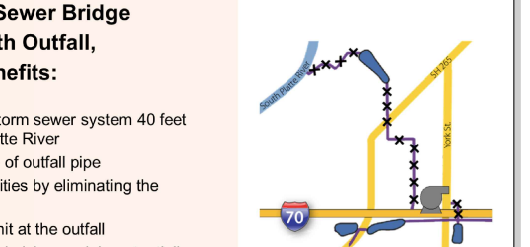
ATCs

Central 70

Front Range Mobility Group

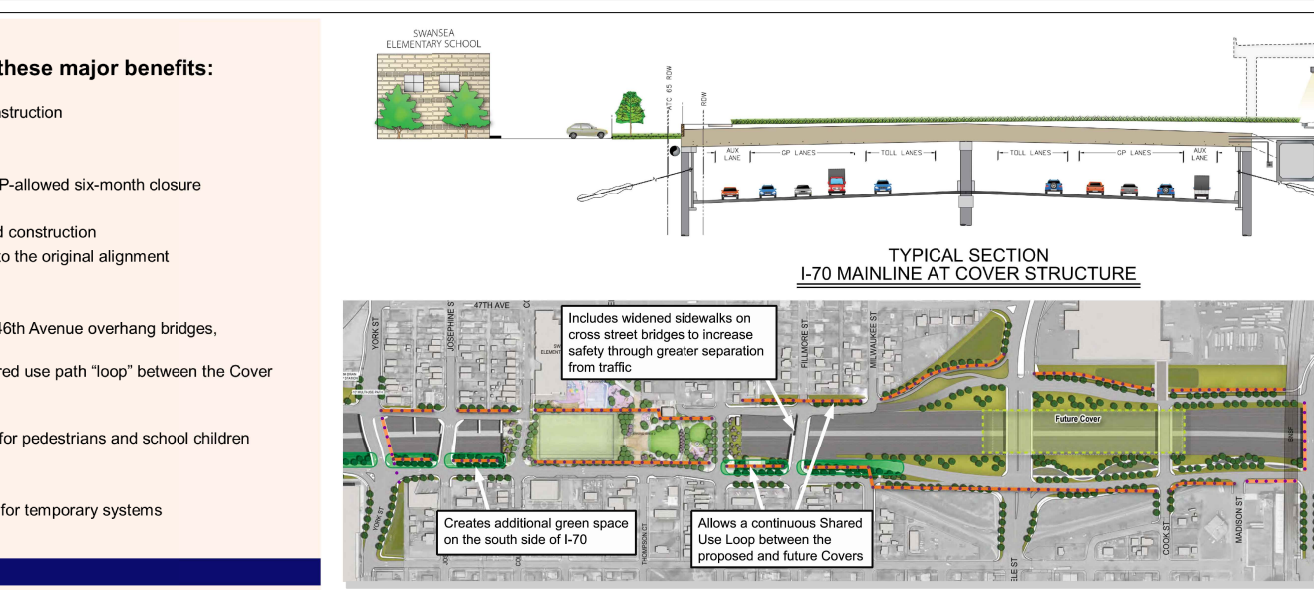
ATC 21: Eliminate Storm Sewer Bridge crossing I-70 and the North Outfall, providing these major benefits:

- Eliminates tunneling of large 72" storm sewer system 40 feet below grade to outfall at South Platte River
- Decreases long-term maintenance of outfall pipe
- Reduces impacts to local communities by eliminating the construction of the outfall pipe
- Eliminates the need for a 404 permit at the outfall
- Allows I-70 profile to be raised, minimizing work in potentially contaminated soils and groundwater
- Allows relocation of pump station closer to Lowered Section



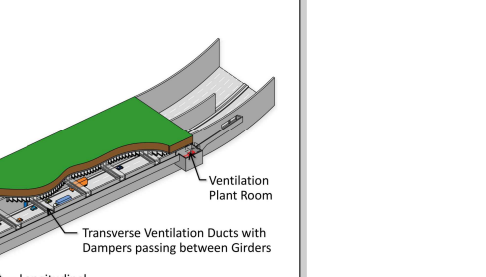
ATC 65: Shift I-70 alignment to the north by 40 feet to reduce conflicts with existing viaduct, providing these major benefits:

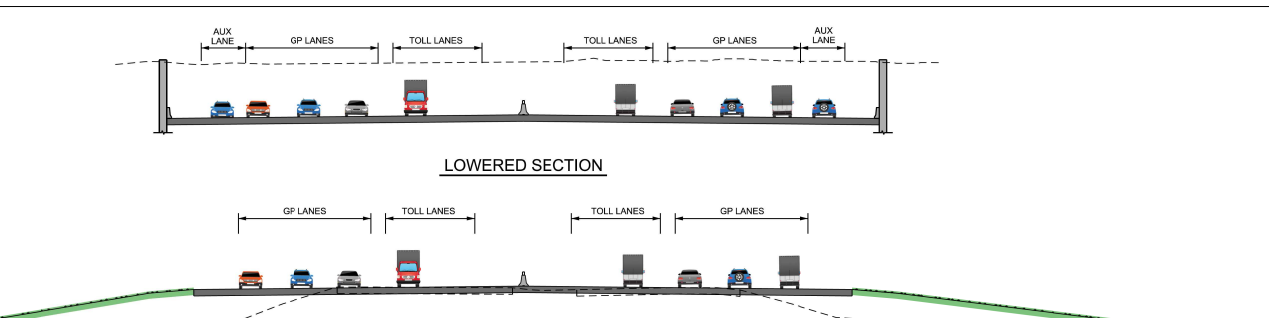
- Enhances safety by physically separating construction from the traveling public by maintaining traffic on the viaduct for the first three years of construction
- Streamlines MOT by eliminating one phase of construction in the Lowered Section and allowing the Project to be completed 6 months early
- Reduces construction in front of Swansea Elementary School by one year
- Maintains the Steele/Vasquez Boulevard Interchange EB exit and WB entrance ramps open during the duration of the Project, eliminating the RFP-allowed six-month closure
- Maintains local access and connectivity and reduces impacts to the surrounding communities and public
- Improves construction efficiency and increases quality by allowing nearly-full construction of I-70 in the Lowered Section and reducing segmented construction
- Allows the majority of cross-street bridges to be built in a single phase and become operational during Phase 1, expediting getting traffic back onto the original alignment
- Allows WB Toll Express Lanes to be available 22 months early
- Allows EB Toll Express Lanes to be available 9 months early
- Creates better air quality and reduces noise at sensitive receptors due to moving the exhaust plenum to the south side of I-70 and providing the 46th Avenue overhang bridges, which muffle some of the I-70 traffic noise
- Provides additional community aesthetic and recreational elements adjacent to the cover, including additional green space and a continuous shared use path "loop" between the Cover and the future Cover near Steele Street/Vasquez Boulevard
- Provides 3.5 acres of additional irrigated landscape, 175 additional trees, and 35,500 square feet of additional sidewalk/shared use path
- Provides widened sidewalks on cross-street bridges to enhance pedestrian mobility and increase safety by providing additional traffic separation for pedestrians and school children
- Allows permanent installation of MEP and aesthetic features across the entire Cover at one time
- Optimizes the storm sewer system by implementing a portion of the City and County of Denver Master Plan drainage system
- Sewer, storm sewer and telecom systems in existing 46th Avenue can remain in place for a longer duration, reducing schedule risk and the need for temporary systems



ATC 26: Modify the Cover ventilation system to a Semi-Transverse System, providing these major benefits:

- Eliminates the large number of jet fans directly above the I-70 roadway under the Cover
- Allows I-70 profile to be raised, minimizing work in potentially contaminated soils and groundwater
- Simplifies access and eliminates lane closures during ventilation system maintenance
- Permits Cover exhaust to be expelled away from Swansea Elementary School, reducing air quality impacts
- Eliminates the potential for vehicle emissions to be recirculated via the Tunnel portals
- Reduces energy costs and long-term maintenance

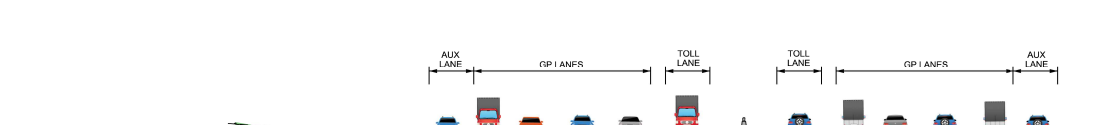




TYPICAL SECTION
I-70 MAINLINE
BRIGHTON BOULEVARD TO SAND CREEK
Concrete Pavement is provided between Brighton Boulevard and Sand Creek on I-70 mainline providing the following benefits:
- Optimizes life cycle cost
- Reduces maintenance and interruptions to traffic
- Provides consistency with existing infrastructure to the west

ATC 25: Modify ultimate I-70 EB alignment to optimize the EB I-270 to EB I-70 Flyover, providing these major benefits:

- Provides more optimal layout of the EB I-270 to EB I-70 flyover bridge
- Lowers the maximum span length of the flyover structure, allowing the use of shorter, shallower girders that are more available from Colorado precast suppliers
- Eliminates straddle bent for the flyover structure



TYPICAL SECTION
I-70 MAINLINE OVERLAY & WIDENING
EAST OF SAND CREEK TO I-225
FRMG performed LIDAR survey east of Sand Creek bridge to improve the accuracy of the proposed cross slope correction

FRMG identified Preventive Maintenance Areas where we will rehabilitate the segments of ramps or mainline outside of the proposed reconstruction limits to provide a consistent maintenance cycle. See the plan and legend for Preventive Maintenance Areas.

Central 70

Front Range Mobility Group