PUBLIC NOTICE

US Army Corps of Engineers®
Albuquerque District

Application Number: SPA-2016-00303-ABQ
Date: December 5, 2016
Comments Due: January 4, 2017

SUBJECT: The U.S. Army Corps of Engineers, Albuquerque District, (Corps) is evaluating a permit application from the City of Manitou Springs (the City) to conduct the Brook Street Bridge Project, which would result in impacts to approximately 0.07 acres and/or 80 linear feet of waters of the United States and/or navigable waters of the United States (i.e. Ruxton Creek). This notice is to inform interested parties of the proposed activity and to solicit comments.

AUTHORITY: This application is being evaluated under Section 404 of the Clean Water Act for the discharge of dredged or fill material in waters of the United States (U.S.) for structures or work in or affecting navigable waters of the U.S.

APPLICANT: City of Manitou Springs
606 Manitou Avenue
Manitou Springs, Colorado 80829

LOCATION: The project site is located at the intersection of Brook Street and Ruxton Creek within the City of Manitou Springs in El Paso County, Colorado. This location falls within Section 5 of Township 14S, Range 67W of the 6th Principal Meridian at latitude 38.859010 and longitude -104.923783.

PROJECT DESCRIPTION: The applicant is proposing to remove the Brook Street Bridge over Ruxton Creek and install stream stabilization, which would include bank grading and rip rap protection. The project is being proposed because of a recent structural engineering assessment that determined this bridge is at risk of imminent failure due to long-term degradation and undermining of the foundation from lowering of the channel. Furthermore, the assessment concluded that non-action could result in safety issues and adverse impacts to downstream structures. As such, the overall project purpose is to remove a structurally deficient bridge to address safety concerns.

The attached drawings and documents provide additional project details.

PROPOSED MITIGATION: Compensatory mitigation at a minimum one-for-one ratio is required for all wetland losses that exceed 0.1 acres and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the

proposed activity are minimal. For wetland losses of 0.1 acres or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR Part 332.

In the case of the Brook Street Bridge Project, the removal of the existing structure and installation of stream stabilization would not result in impacts to wetlands. Furthermore, impacts to the Ruxton Creek stream channel would be less than 0.1 acres. Additionally, some of the impacts would be temporary and the stream channel at this location would still provide the same basic ecological functions (e.g. water conveyance). Therefore, the proposed impacts to Ruxton Creek are considered minimal. As such, compensatory mitigation would not be required for the proposed action.

OTHER AUTHORIZATIONS:

State Water Quality Certification: The State of Colorado has mandated by statute that Section 401 Water Quality Certification is issued without condition for all general permits. The proposed action qualifies for verification under a general permit.

ADDITIONAL INFORMATION:

Environmental Setting. The project site is located at the intersection of Brook Street and Ruxton Creek within the City of Manitou Springs. The City of Manitou Springs is situated within the central part of Colorado at the base of Pikes Peak in the Rocky Mountains. It is approximately 50 miles south of Denver and just west of Colorado Springs along U.S. State Highway 24. The City is bordered by Mount Manitou to the west, Red Mountain to the south, and Englemann Canyon to the south and west. Englemann Canyon contains Ruxton Creek, which flows into Fountain Creek approximately 0.25 miles downstream of the project area.

The project site is located in a residential area that falls within the City of Manitou Springs Historic District. As such, it is surrounded by private residences containing buildings that date to the historic period. Downtown Manitou Springs is located approximately 0.2 miles to the east.

On August 9, 2013, the City was inundated by a flash flood that threatened buildings and other infrastructure. This event, as well as large flows associated with other major storms that have occurred over the last several years, contributed to current maintenance issues related to the many historic bridges within the City's historic district.

Alternatives. The applicant has provided information concerning project alternatives, which is included as an attachment to this document. Other alternatives may develop during the review process for this permit application. All reasonable project alternatives, in particular those which may be less damaging to the aquatic environment, will be considered.

HISTORIC PROPERTIES: The Corps consulted district files and records, the latest version of the National Register of Historic Places (NRHP), and state records to determine if there are any historic properties that may be affected by the proposed undertaking.

The Brook Street Bridge is a small masonry arch structure located within the Multiple Resource Area of Manitou Springs (5EP.530), which is listed on the NRHP as a historic district. Furthermore, the Brook Street Bridge (5EP.530.271) has been determined to be a contributing element to the historic district, and has also been recommended as eligible to the NRHP individually based on a field-level assessment.

The Corps and State Historic Preservation Officer (SHPO) have determined that there would be an adverse effect to historic properties resulting from the proposed action. As such, representatives from the City, the Corps, and staff members of the Office of Archaeology and Historic Preservation (OAHP) met on September 29, 2016 in Denver to discuss potential measures to mitigate the adverse effects. As a follow-up to that meeting the attached Mitigation Memo (i.e. Mitigation Plan) was submitted to the Corps, OAHP, and SHPO for review and comment.

ENDANGERED SPECIES: The Corps has reviewed the U.S. Fish and Wildlife Service's latest published version of Federally-listed endangered and threatened species located in El Paso County to determine if any listed species or their critical habitat may occur in the proposed project area. The Corps has made a preliminary determination that the proposed project will not affect any Federally-listed endangered or threatened species or their critical habitat that are protected by the Endangered Species Act.

FLOODPLAIN MANAGEMENT: In accordance with 44 CFR part 60, the floodplain administrators of participating communities are required to review all proposed development to determine if a floodplain development permit is required and maintain records of such review.

CLOSE OF COMMENT PERIOD: All comments pertaining to this Public Notice must reach this office on or before January 4, 2017, which is the close of the comment period. Extensions of the comment period may be granted for valid reasons provided a written request is received by the limiting date. If no comments are received by that date, it will be considered that there are no objections. Comments and requests for additional information should be submitted to:

Van Truan, Project Manager and Southern Colorado Branch Chief
U.S. Army Corps of Engineers, Albuquerque District
200 South Santa Fe Avenue, Suite 301
Pueblo, Colorado 81003
Phone: (719) 543-6915
Email: Van.A.Truan@usace.army.mil

Or

Chris M. Parrish
U.S. Army Corps of Engineers, Albuquerque District

Regulatory Division Cultural Resource Specialist
4101 Jefferson Plaza, NE
Albuquerque, NM 87109
Phone: 505.342.3374
Email: Christopher.M.Parrish@usace.army.mil

Please note that names and addresses of those who submit comments in response to this public notice may be made publicly available through the Freedom of Information Act.

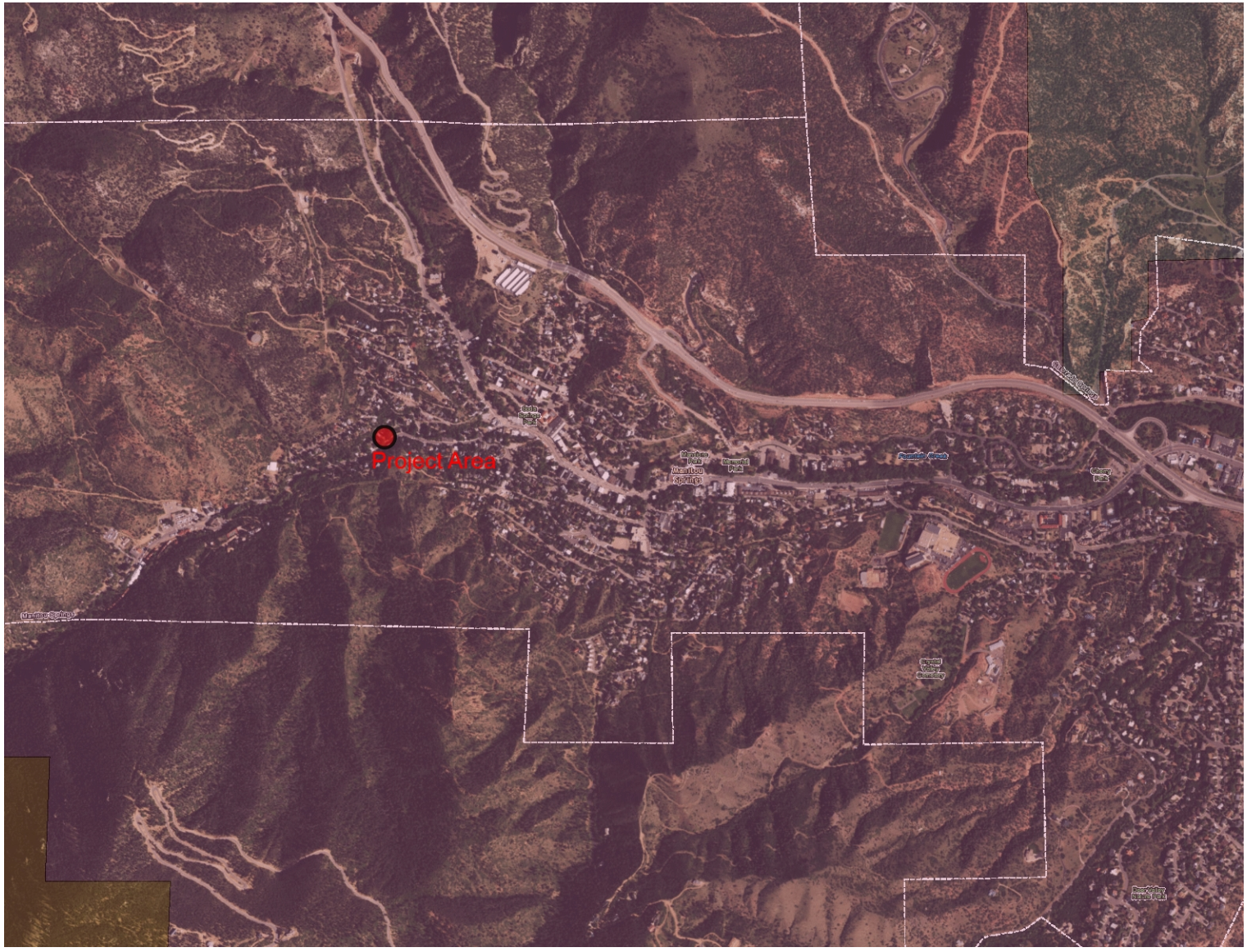
DISTRICT ENGINEER
ALBUQUERQUE DISTRICT
CORPS OF ENGINEERS

Enclosures:

1. Project Area Maps
2. Photographs of Brook Street Bridge
3. Design Alternatives Memo
4. Structural Condition Assessment Report
5. Bridge Demolition Plans
6. Proposed Mitigation Plan

US Army Corps of Engineers
Albuquerque District

City of Manitou Springs Brooks Street Bridge Removal Project



Legend

- NLD Levee Centerline
- Non-NLD Local Protection Proj
- SPA District Boundary
- Endangered Species Critical H
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- National Wetlands Inventory
  - Freshwater Emergent Wetland
  - Freshwater Forested/Shrub Wetlan
  - Freshwater Pond
  - Lake
  - Other Freshwater Wetland
  - Riverine
- Tribal Land
- Non-Tribal Land Ownership
  - US Bureau of Land Management
  - US Bureau of Reclamation
  - US Dept of Administration
  - US Dept of Defense
  - US Dept of Energy
  - US Forest Service
  - US Fish and Wildlife Service
  - US National Park Service
  - Other Federal Agency

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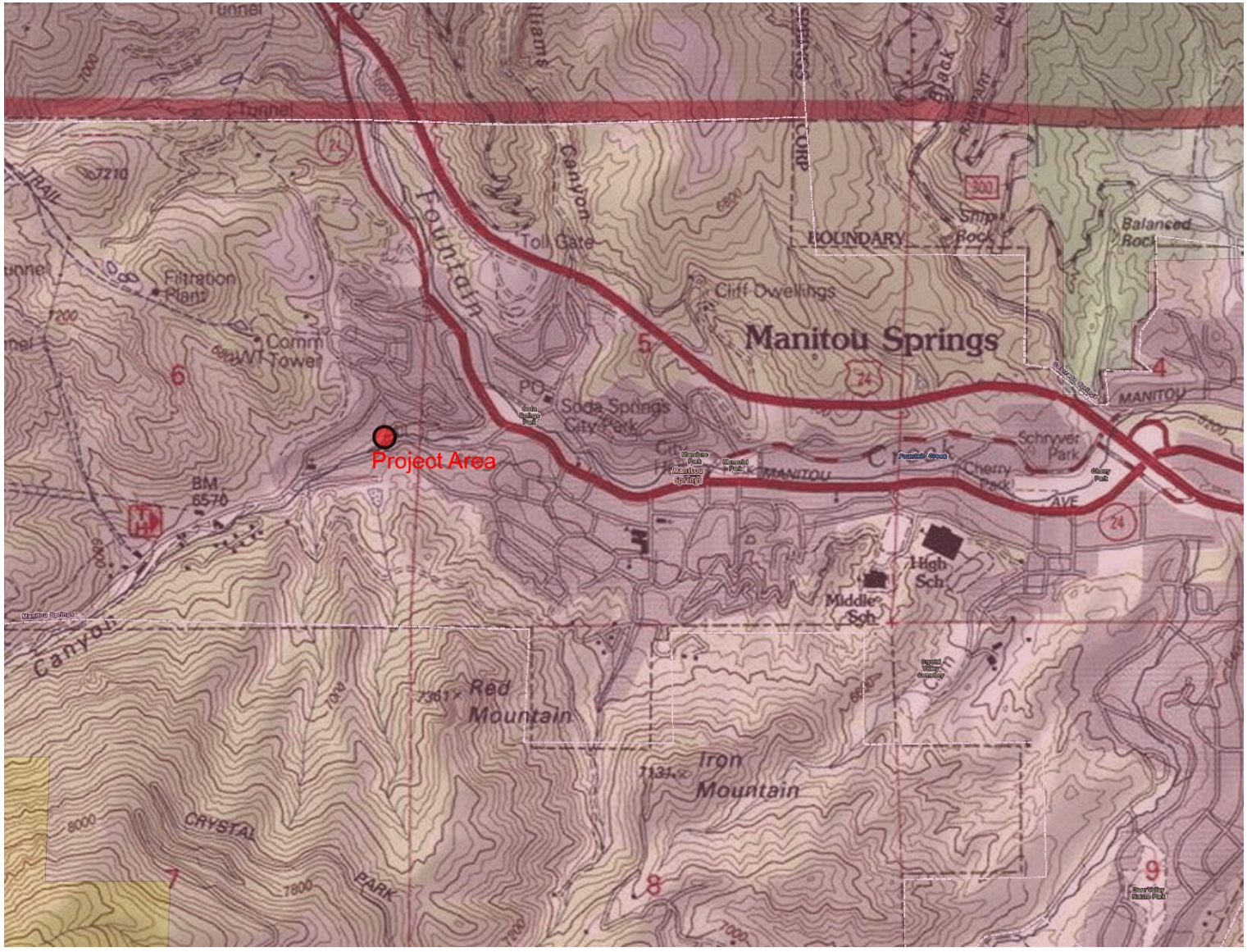
Web Mercator Projection. Distance measurements may not be exact.

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Map Date: 9/20/2016

US Army Corps of Engineers
Albuquerque District

City of Manitou Springs Brooks Street Bridge Removal Project



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Map Date: 9/20/2016

Attachment B: Pre-demolition Photos of the Brook Street Bridge

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Memo

To: Sara Hartley, Shelley Cobau

From: Jennifer Forbes

cc: Bob McGregor, File

Date: May 6, 2016

Re. Brook Street Rehabilitation Design Alternatives

Summary

I have attached power point slides and total cost estimates for 3 rehabilitation options:

- Option 1 – Multiplate Arch with Footings
- Option 2 – Pipe Arch
- Option 3 – Precast Concrete Arch (Replacement)

The alternative for converting the bridge for pedestrian use was not evaluated because the current condition of the bridge is failing. A condition assessment of the bridge cannot be done other than by field load testing. Even if the bridge passes current load tests, the barrel will continue to loose section, and is estimated to eventually fail if not repaired.

I did not format the slides, as I assume you already have a format you currently use and can insert the information I provided. Seth's estimate for the Contech materials is provided in this memo, and I have attached Danny Tezak's construction estimates to the end of this memorandum with the other attachments. Tezak's estimate includes a 4th option, which has a concrete apron between footings for a multi-plate arch. Danny and I had originally discussed that this may be needed for scour – but we will not likely need this option.

In summary the pipe arch option is still the cheapest, and likely easiest to install. The total cost has increased due to Seth configuring a larger pipe section to keep the opening as large as possible for the hydraulics and to minimize grouting, and the addition of masonry work to cover the grout lines. Our design fee did not change for this option. I assume that we will wait until the council has agreed to a design alternative, and then reissue a cost proposal for the selected design.

Please note the drain improvement add alternative is still separate from these estimates, as I wasn't sure if you wanted this drain reconstructed, or just have a slope rundown? The amount provided is just an estimate and can be adjusted based on the design selected by the City. Also, Tezak does not include traffic control costs, as we assume the City would handle this during construction.

Also note the pipe arch option only will likely provide about 6 feet wide, by up to 6 to 8 inches of stream bed over the pipe. I am not sure if there are any restrictions for this, or if more natural stream bed is required for environmental or fishery constraints?

Colorado Center Tower II
2000 South Colorado Blvd.
Suite 2-1000
Denver, Colorado 80222
amecfw.com

Contech Materials Costs (from Seth)

The “pipe arch” shape was adjusted and made to have a larger opening. The SRA shape (multi-plate arch) was made so that the legs had no return angle (vertical section) and stayed within the 6” of the existing shape. Please note that these estimates are for delivered material only and does include grouting, installation, or any kind of end treatments for the skewed ends of the structure.

Option 1: Aluminum Structural Plate Single Radius Arch
- 37 LF of .225” thick ALSP SRA (20N structure)
- Estimate: $18.5k

Option 2: Aluminum Structural Plate Pipe Arch
- 37 LF of .225” thick ALSP PA (41N structure)
- Estimate: $28k

Option 3: Conspan Precast Concrete Arch as a full replacement
- 37 LF of Conspan 12’ span x 10’ rise precast concrete arch with skewed ends (max skew = 23 degrees)
- Estimate: $45k

NOTE: The length of 37 feet is estimated to include full barrel length and extra length for skews at each end.

Tezak – Contractor Costs

I have attached all option cost estimates, but I wanted to note that Danny updated the Pipe Arch estimate by the following:

1. Reduction of the quantity of grout.
2. Increased the unit cost of the install, which I assume is based on a larger and heavier updated section from Seth.
3. Added the Masonry work (stone veneer) to cover the grout per our meeting discussion.

Previous Estimate:

Reference	Description	Qty	Units	Unit Cost	Extd Cost
1	Diversion / Dewatering	1	LS	$26,887.09	$ 26,887.09
2	Clean Existing Arch / Grade Prep	1	EACH	$10,880.25	$ 10,880.25
3	Concrete Washout Structure	1	EA	$ 808.02	$ 808.02
4	Annular Space Grouting	133	CY	$ 253.46	$ 33,710.18
5	Install Multiplate (Labor & Equip Only)	20	LF	$ 1,800.00	$ 36,000.00
6	Mobilization	1	L S	$15,475.41	$ 15,475.41
				GRAND TOTAL	**$ 123,760.95**

New Estimate:

	ALUMINUM STRUCTRUAL PLATE ARCH PIPE				
OPT 2.1	Diversion / Dewatering	1	LS	$ 26,583.46	$ 26,583.46
OPT 2.2	Clean Existing Arch / Grade Prep	1	EACH	$ 10,716.73	$ 10,716.73
OPT 2.3	Concrete Washout Structure	1	EA	$ 798.09	$ 798.09
OPT 2.4	Annular Space Grouting	41	CY	$ 252.35	$ 10,346.35
OPT 2.5	Install Multiplate	20	LF	$ 3,599.98	$ 71,999.60
OPT 2.6	Masonry Work on Bulkheads (3' Around Arch)	212	SF	$ 127.20	$ 26,966.40
OPT 2.7	Mobilization	1	L S	$ 15,500.90	$ 15,500.90
					$ 162,911.53

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Attachment 1 - Cost Estimate for Design Alternatives

Option 1 - Multiplate Arch with Footings	
Design Fee	$26,825.00
Contech – Supply and Design fees	$18,500.00
Tezak – Construction Sub Consultant (see attached)	$275,946.92
Amec Foster Wheeler Construction Management	
Coordination and Progress Reporting (4% Tezak)	$11,037.88
Construction Observation and QA/QC (6% Tezak)	$16,556.82
Prime Contractor Fee (6% Tezak)	$16,556.82
Project Report	$3,000.00
As-Built Drawings	$2,000.00
Performance and Payment Bonds (5% Tezak)	$13,797.35
Construction Contingency	$10,000.00
Total	$72,948.85
Total	**$394,220.79**
Drain Improvement Add Alternative	$30,000.00

Option 2 - Pipe Arch	
Design Fee	$23,693.00
Contech – Supply and Design fees	$28,000.00
Tezak – Construction Sub Consultant (see attached)	$162,911.53
Amec Foster Wheeler Construction Management	
Coordination and Progress Reporting (4% Tezak)	$6,516.46
Construction Observation and QA/QC (6% Tezak)	$9,774.69
Prime Contractor Fee (6% Tezak)	$9,774.69
Project Report	$3,000.00
As-Built Drawings	$2,000.00
Performance and Payment Bonds (5% Tezak)	$8,145.58
Construction Contingency	$10,000.00
Total	$49,211.42
Total	**$263,815.95**
Drain Improvement Add Alternative	$30,000.00

Option 3 - Precast Concrete Arch (Replacement)	
Design Fee	$35,757.00
Contech – Supply and Design fees	$45,000.00
Tezak – Construction Sub Consultant (see attached)	$268,367.49
Amec Foster Wheeler Construction Management	
Coordination and Progress Reporting (4% Tezak)	$10,734.70
Construction Observation and QA/QC (6% Tezak)	$16,102.05
Prime Contractor Fee (6% Tezak)	$16,102.05
Project Report	$3,000.00
As-Built Drawings	$2,000.00
Performance and Payment Bonds (5% Tezak)	$13,418.37
Construction Contingency	$10,000.00
Total	$71,357.17
Total	**$420,481.66**
Drain Improvement Add Alternative	$30,000.00

205 Tunnel Drive
Canon City, CO 81212
Phone 719-269-1173
Fax 719-269-1148

1755 Telstar Dr. Ste. 300
Colorado Springs, CO 80920
Phone 719-622-6215
Fax 719-269-1148

Equal Opportunity Employer

May 5, 2016

Ms. Jennifer Forbes, PE
Senior Engineer, Environment & Infrastructure
Amec Foster Wheeler
Colorado Center Tower II
2000 S. Colorado Blvd, Suite 2-1000
Denver, CO 80222

RE: Manitou Springs Brooks Street Arch Alternatives Conceptual Pricing

Jennifer,

Tezak Heavy Equipment is pleased to present this ***conceptual level*** pricing for the proposed Design / Build project to rehabilitate or replace the existing historical arch structure over Ruxton Creek in the alignment of Brooks Street in Manitou Springs. This pricing is based upon the *"Assumptions and Clarifications"* as presented below and may be subject to change upon review of the completed design.

Reference	Description	Qty	Units	Unit Cost	Extd Cost
	ALUMINUM ARCH ON FOOTERS/WALLS				
OPT 1.1	Diversion / Dewatering	1	LS	$ 44,450.32	$ 44,450.32
OPT 1.2	Structure Excavation / Grade Prep	1	EACH	$ 12,913.09	$ 12,913.09
OPT 1.3	Shoring of Foundation	1	LS	$ 54,950.40	$ 54,950.40
OPT 1.4	Cast In Place Footers/Walls (H=5')	26	CY	$ 1,590.00	$ 41,340.00
OPT 1.5	Concrete Washout Structure	1	EA	$ 798.09	$ 798.09
OPT 1.6	Annular Space Grouting	33	CY	$ 252.35	$ 8,327.55
OPT 1.7	Install Multiplate Arch	37	LF	$ 2,237.41	$ 82,784.17
OPT 1.8	Masonry Work on Bulkheads (1.5' Around Arch)	92	SF	$ 127.20	$ 11,702.40
OPT 1.9	Mobilization	1	L S	$ 18,680.90	$ 18,680.90
					$ 275,946.92
	ALUMINUM STRUCTRUAL PLATE ARCH PIPE				
OPT 2.1	Diversion / Dewatering	1	LS	$ 26,583.46	$ 26,583.46
OPT 2.2	Clean Existing Arch / Grade Prep	1	EACH	$ 10,716.73	$ 10,716.73
OPT 2.3	Concrete Washout Structure	1	EA	$ 798.09	$ 798.09
OPT 2.4	Annular Space Grouting	41	CY	$ 252.35	$ 10,346.35
OPT 2.5	Install Multiplate	20	LF	$ 3,599.98	$ 71,999.60
OPT 2.6	Masonry Work on Bulkheads (3' Around Arch)	212	SF	$ 127.20	$ 26,966.40
OPT 2.7	Mobilization	1	L S	$ 15,500.90	$ 15,500.90
					$ 162,911.53

	CONSPAN STRUCTURE				
OPT 3.1	Diversion / Dewatering	1	LS	$ 26,583.46	$ 26,583.46
OPT 3.2	Remove Existing Arch	1	LS	$ 11,866.47	$ 11,866.47
OPT 3.3	Structure Excavation 1.5:1 Backslopes	1026	CY	$ 18.64	$ 19,124.64
OPT 3.4	Footing Concrete	48	CY	$ 1,618.61	$ 77,693.28
OPT 3.5	Conspan Install (Incl. Wings)	37	LF	$ 2,275.78	$ 84,203.86
OPT 3.6	Structure Backfill	400	CY	$ 75.12	$ 30,048.00
OPT 3.7	Concrete Washout Structure	1	EA	$ 798.09	$ 798.09
OPT 3.8	Mobilization	1	L S	$ 18,049.69	$ 18,049.69
					$ 268,367.49
	ALUMINUM ARCH WITH CONCRETE FLOOR				
OPT 4.1	Diversion / Dewatering	1	LS	$ 44,450.32	$ 44,450.32
OPT 4.2	Structure Excavation / Grade Prep	1	LS	$ 12,913.09	$ 12,913.09
OPT 4.3	Cast In Place Floor & Walls	40	CY	$ 1,590.00	$ 63,600.00
OPT 4.4	Concrete Washout Structure	1	EA	$ 798.09	$ 798.09
OPT 4.5	Annular Space Grouting	33	CY	$ 252.35	$ 8,327.55
OPT 4.6	Install Multiplate Arch	37	LF	$ 2,237.41	$ 82,784.17
OPT 4.7	Masonry Work on Bulkheads (1.5' Around Arch)	92	SF	$ 127.20	$ 11,702.40
OPT 4.8	Mobilization	1	L S	$ 18,680.90	$ 18,680.90
					$ 243,256.52

Assumptions/Clarifications:

1. Assumption for Option 2 is that we can construct the arch outside of the channel and hoist it down into place. This will require the removal of several trees on the downstream end of the channel for a distance of 35 LF.
2. Traffic Control to include lane closures will be required during the installation of the arch. We recommend looking at timeframes for installation that will coincide with non-peak traffic volumes or look at a potential detour around the site on Pilot Knob Avenue or another route (if possible).
3. Diversion / Dewatering includes pumping or diverting for arch installations during a time of historically low flows (late fall/early winter). We would like to explore the possibility of working with CSU to divert a portion of the flows around the site for a short time during the installation (1-2 weeks).
4. Clean Existing Arch / Grade Prep (Option 2) includes placing a 1 foot thick layer of bedding (#67 aggregate) in the existing alignment for the multi-plate to set on. Any existing riprap or rocks in the creek that conflict with the proposed grades will be removed and salvaged for outlet protection.
5. Annular Space Grouting includes cellular grout (per the provided spec) to fill the annular space between the existing arch and the new multi-plate pipe. This volume is dependent upon the selected geometry of the Contech Arch and will vary accordingly.
6. Install Multi-plate (Option 2) includes constructing the multi-plate pipe, setting it in the channel, sliding it into place, installing grout tubes, constructing bulkheads on each end

to contain the foam grout, bracing the interior of the multi-plate, and weighting or bracing to offset buoyancy during the placement of the annular space grout.
7. Mobilization to include all general condition items, (insurance, bonding, supervision, etc.) as well as transporting all equipment and personnel to the site.
8. Shoring for Option 1 will be very difficult, at best and may be “un-constructable” at worst. If this can be engineered out, or reduced, the price could be re-negotiated accordingly.

Exclusions:

1. Connecting to existing side drain into the multi-plate. We recommend a drop inlet with a pipe to the channel downstream of the arch outlet or alternatively a grouted boulder rundown to convey the surface flows from the concrete slope and ditch paving down to Ruxton Creek.
2. Permits (404, floodplain development, etc.)
3. Engineering (with the exception of calculations for buoyancy and grout pressures).
4. Concrete toe walls or any type of scour protection (with the exception of a riprap outlet pad).
5. Utility coordination to move lines for hoisting of pipe into channel. We believe this to be a simple coordination with the cable TV company to temporarily raise or relocate the lines during install of the pipe.

Thank you for the opportunity to work with your firm on this project, and we look forward to a favorable reply to this proposal at your earliest convenience.

Sincerely,

Danny Tezak

Structural Condition Assessment Report for the Brook Street Masonry Arch Bridge

The enclosed is a condition evaluation of the structural components comprising the Brook Street Masonry Arch Bridge located in the City of Manitou Springs, Colorado.

Stantec

Prepared for:
City of Manitou Springs

Prepared by:
Stantec Consulting Services Inc.

May 13, 2015

Inspection Findings

Stone Masonry Arch

The Brook Street Masonry Arch Bridge is constructed of natural stones stacked together with mortar to form a traditional arch. The stones in the arch must always be in compression to support the dead load of fill and roadway material and to properly transfer live loads from crossing vehicles into the foundation. Once the compression component of any stacked stone arch of this nature is compromised, failure of a portion or the entire structure can and is likely to occur.

Overall, the Brook Street Masonry Arch Bridge is at risk of imminent failure due to long-term degradation and lowering of the channel causing undermining of the foundation at the springline and loss of compression between the barrel stones. This condition has already led to partial collapse of the arch barrel in areas.

General Comments

- There are numerous missing, loose, and/or undermined stones along the bottom 2'-0" of the north and south arch springlines and barrel. Typically, the mortar between the stones at this lower portion of the arch is missing, disintegrating, brittle, and/or easily removed. Numerous stones along the footing and springlines do not appear to bear any load and many can easily be removed by hand.
- There are vertical cracks and separations between the stones in the arch barrel at all four corners.
- There is visual sagging of the horizontal stone courses in the arch barrel at many locations, especially above collapsed barrel areas at the north and south.

South Barrel

- There is a 12'-0" long x 3'-0" high x 2'-0" deep (horizontal penetration) collapsed area with numerous missing and loose stones exposing backfill in the south barrel of the arch near the east end.
- There is a 5'-0" long x 2'-0" high area of missing stones in the south arch footing at the west end.

North Barrel

- There is a 7'-0" long x 4'-0" high x 3'-0" deep (horizontal penetration) collapsed area with numerous missing stones exposing backfill in the north barrel of the arch near the east end. A 4'-0" long x 3'-0" high area of stones above this effective hole is starting to collapse.

- There is a 3'-0" long x 1'-0" high area of missing stones in the north arch footing at the west end.

Stone Masonry Railing

The spandrel walls of the arch extend above the roadway elevation to act as masonry bridge rails. The railings are in overall Poor Condition. There are numerous missing or loose stones throughout both railings. The mortar between the remaining stones is typically deteriorated, brittle and/or missing. The railings are of sub-standard height and do not meet any current traffic safety standards or requirements. No approach rails are present.

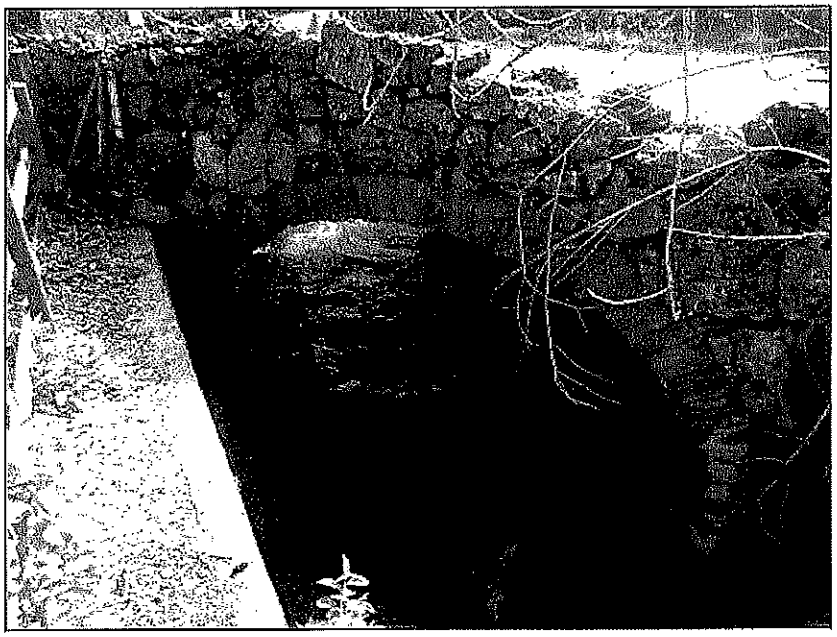
Channel

The channel is in overall Fair Condition. Numerous stones along the footing and springlines of the arch have been undermined, displaced, or washed away. The adjacent footings of the concrete retaining walls upstream are exposed. The undermined stones and exposed footings generally indicate that the channel has experienced long-term degradation and lowering of the channel bottom over time.

General Remarks

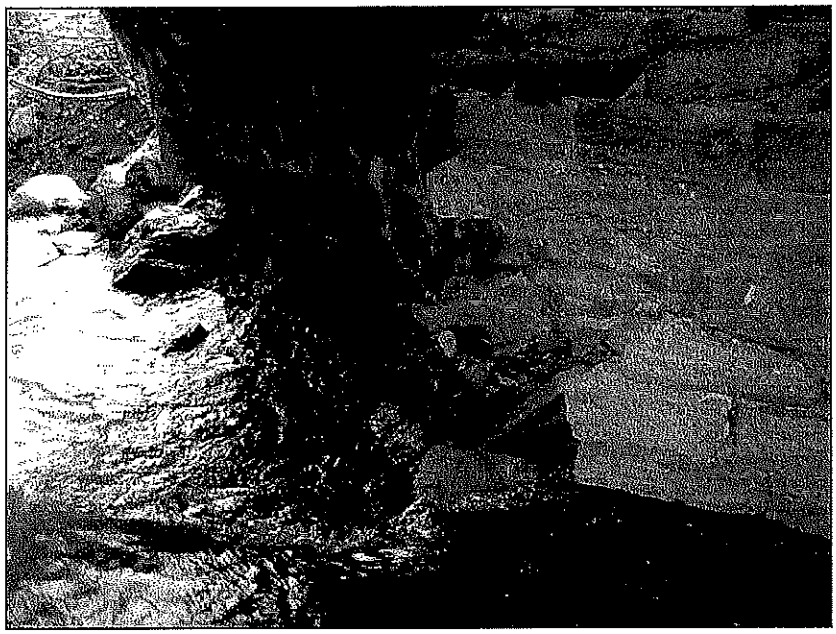
Due to the observed conditions present at the Brook Street Masonry Arch Bridge, the structure is currently closed to both vehicular and pedestrian traffic.

South approach looking north



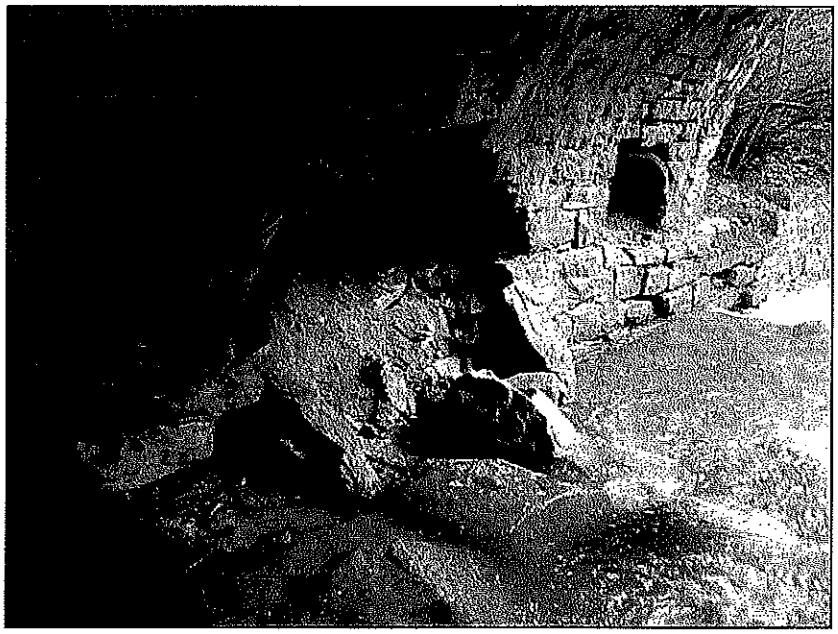
West elevation looking east

General view of arch barrel looking west

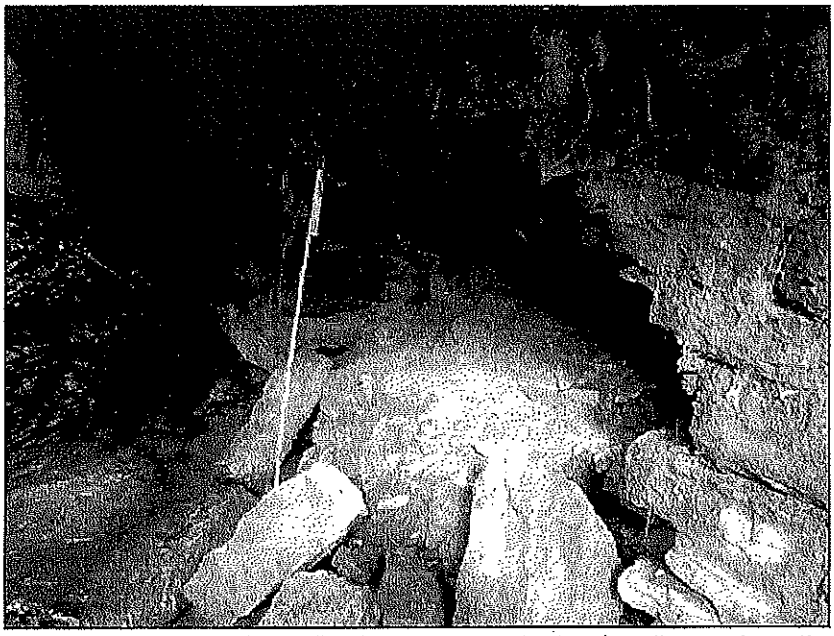


12'-0" long x 3'-0" high x 2'-0" deep (horizontal penetration) collapsed section of arch barrel at the south

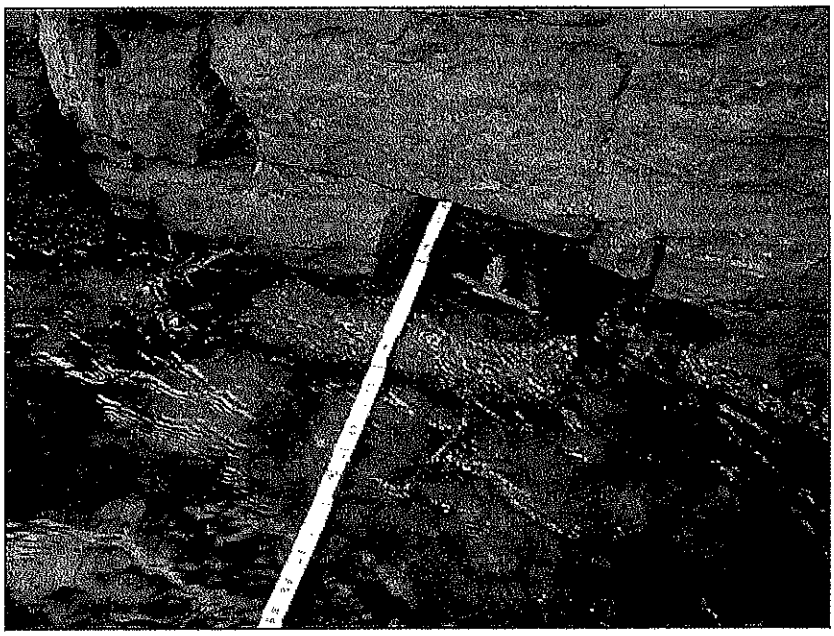
12'-0" long x 3'-0" high x 2'-0" deep (horizontal penetration) collapsed section of arch barrel at the south (close-up view)



7'-0" long x 4'-0" high x 3'-0" deep (horizontal penetration) collapsed section of arch barrel at the north

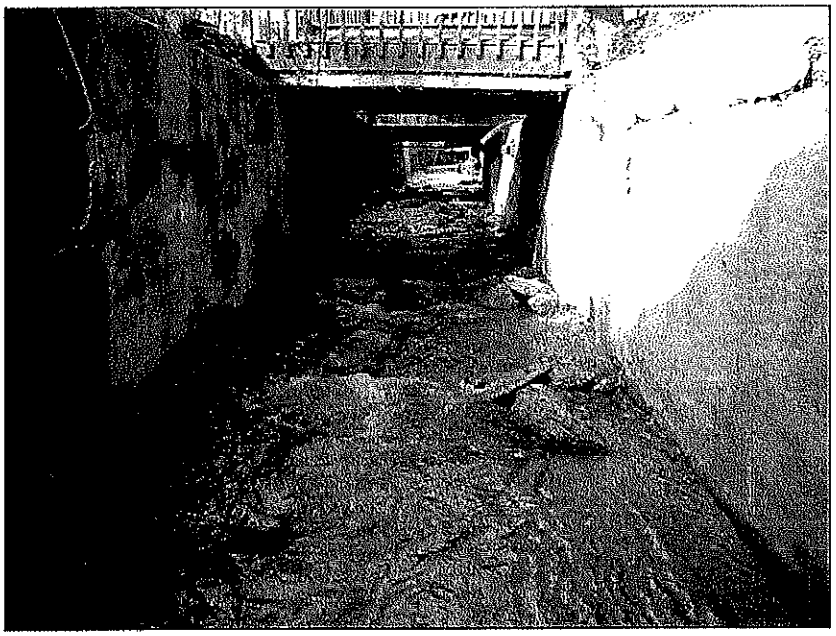


7'-0" long x 4'-0" high x 3'-0" deep (horizontal penetration) collapsed section of arch barrel at the north (close-up)



Typical loss of mortar between stones and undermined and missing stones at west end of barrel at north

Typical condition of railing with missing stones, deteriorated and missing mortar



Channel looking upstream; note the exposed footing along the south retaining wall

Channel looking downstream

Recommendations

The following are Stantec recommendations for the Brook Street Masonry Arch Bridge:

- Due to the recent major damage sustained to portions of the arch footing, springline and barrel, this structure should remain closed to all uses, both vehicular and pedestrian, until rehabilitation or replacement has occurred. A six foot high fence, in conjunction with concrete or other substantial barriers, should be installed across the roadway approaches to the bridge to block access over the structure. The fence and barriers should be of sufficient size and weight to prevent unwanted climbing or movement by the general public looking to cross the structure.

- It is recommended that the structure be extensively rehabilitated or entirely replaced due to the high cost in trying to reestablish a suitable compressive structural condition within the footing, springline and barrel stones.

- It is recommended to regularly monitor the structure and adjacent roadway approaches for any changes in condition. This may include sloughing of the roadway embankment or fill over the arch, settlement of the roadway approaches and/or complete collapse of the structure and roadway.

May 13, 2015

This document entitled Structural Condition Assessment Report for the Brook Street Masonry Arch Bridge was prepared by Stantec Consulting Services Inc. ("Stantec") for the City of Manitou Springs. The material herein reflects Stantec's professional judgment in light of the scope, schedule and information available at the time of preparation. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Team Leader (signature)
Adam Leith, PE

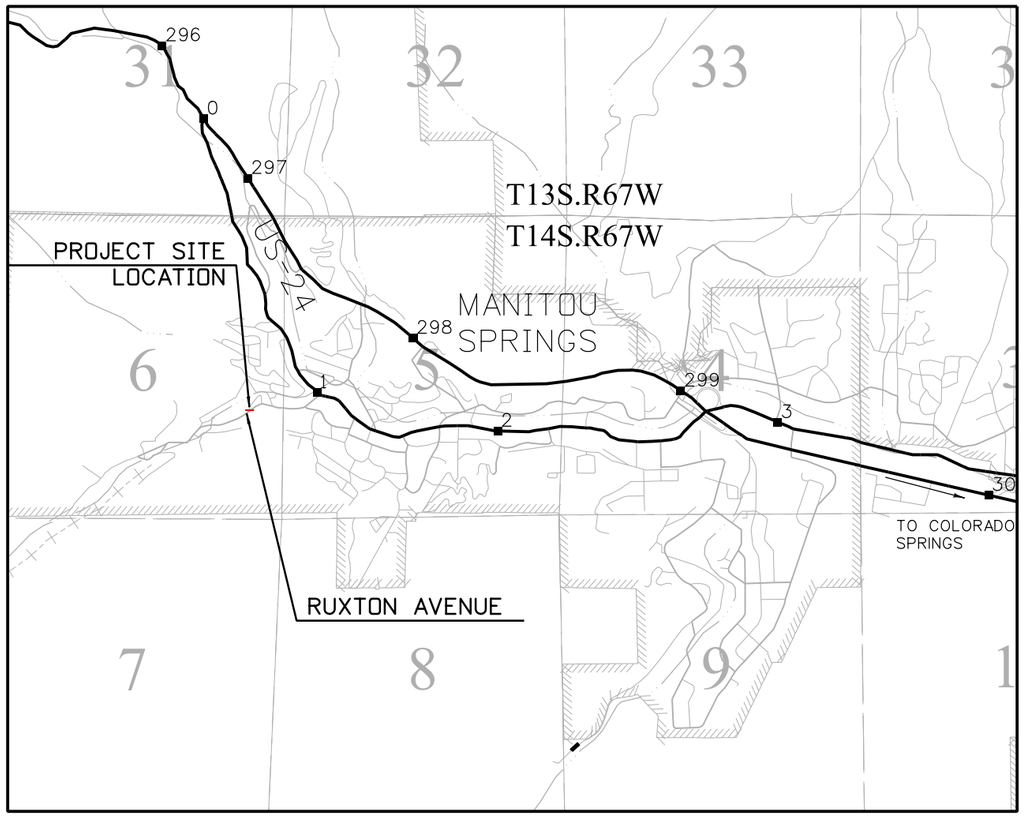
Reviewed by (signature)
Ryan Nataluk, PE

CITY OF MANITOU SPRINGS

HAZARD MITIGATION AND RESILIENCY DEPARTMENT

CONSTRUCTION PLANS OF PROPOSED
BROOK STREET BRIDGE DEMOLITION

EL PASO COUNTY



PROJECT LOCATION MAP
(NTS)

INDEX OF DRAWINGS

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Print Date: 8/29/2016
File Name: 01_TitleSht.dgn
Horiz. Scale: 1:0.5 Vert. Scale: As Noted
Unit Information

amec foster wheeler

R-X

Sheet Revisions

Date:	Comments	Init.

City of Manitou Springs

606 Manitou Avenue
Manitou Springs, CO 80829

30% Design

No Revisions:
Revised:
Void:

TITLE SHEET

Designer: J. Forbes
Detailer: J. Forbes
Sheet Subset:
Structure Numbers
Subset Sheets: 01 of 06

Project No.

32790066

BROOK STREET BRIDGE DEMOLITION

Sheet Number 1

GENERAL NOTES

A PRE-CONSTRUCTION SURVEY OF THE PROJECT SITE WILL BE PROVIDED BY THE CITY PRIOR TO MOBILIZATION TO THE SITE. THE CITY'S SURVEYOR SHALL STAKE ALL ROW, (INCLUDING TEMPORARY AND PERMANENT EASEMENTS AS REQUIRED) PRIOR TO ANY WORK OCCURRING IN THE AREA. ONCE THE AREA OF WORK IS CLEARLY MARKED, THE CONSTRUCTION SUBCONTRACTOR SHALL KEEP ALL MATERIALS, EQUIPMENT, AND VEHICLES WITHIN THE PROJECT WORK AREA, TEMPORARY, AND PERMANENT EASEMENTS; THIS INCLUDES USING PRIVATE PROPERTY FOR ACCESSES FOR EQUIPMENT OR VEHICLES. FAILURE TO COMPLY WITH THESE REQUIREMENTS MAY RESULT IN A STOP WORK ORDER BEING ISSUED. THE CONSTRUCTION SUBCONTRACTOR SHALL PROTECT ALL EXISTING SURVEY MONUMENTATION DESIGNATED TO REMAIN FROM DAMAGE DURING CONSTRUCTION OPERATIONS. ANY MONUMENTS DISTURBED BY THE CONSTRUCTION SUBCONTRACTOR THAT ARE NOT DESIGNATED FOR RELOCATION SHALL BE RESET AT THE CONSTRUCTION SUBCONTRACTOR'S EXPENSE. THE CONSTRUCTION SUBCONTRACTOR AND THE CITY SHALL NOTE THOSE MONUMENTS IN THE FIELD PRIOR TO CONSTRUCTION. ELEVATIONS AND DIMENSIONS CONTAINED IN THESE PLANS ARE ONLY APPROXIMATE. THE CONSTRUCTION SUBCONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL. THE CONSTRUCTION SUBCONTRACTOR SHALL PROVIDE A SURVEY OF THE AS-BUILT WALLS, INCLUDING ANY ENCOUNTERED STRUCTURES, FOUNDATIONS, OR ITEMS BELOW GRADE. THIS WORK SHALL BE INCLUDED IN ITEM 625 CONSTRUCTION SURVEYING.

DEWATERING AND WATER CONTROL WILL BE REQUIRED AS PART OF THE PROJECT, AND SHALL BE PAID FOR AS
PART OF ITEM 208 WATER CONTROL INCLUDING COMPLIANCE WITH CONSTRUCTION DEWATERING COG070000.

THE CONSTRUCTION SUBCONTRACTOR SHALL SUBMIT A SAFETY CRITICAL CONSTRUCTION PLAN TO THE CITY PRIOR TO COMMENCING WORK.

THE CONSTRUCTION SUBCONTRACTOR SHALL NOT PARK ANY VEHICLES OR EQUIPMENT IN, OR DISTURB ANY AREAS NOT APPROVED BY THE CITY. ANY STAGING AREAS APPROVED BY THE CITY SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION AT THE END OF THE PROJECT AT THE CONSTRUCTION SUBCONTRACTOR'S EXPENSE.

WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE AS DIRECTED BY THE CITY. THIS ITEM SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED WITH ITEM 626 MOBILIZATION.

ALL MATERIAL REMOVED ON THIS PROJECT SHALL BECOME THE PROPERTY OF THE CONSTRUCTION SUBCONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT, UNLESS NOTED OTHERWISE AS MATERIAL OF SIGNIFICANT HISTORIC VALUE BY THE CITY. NO SEPARATE PAYMENT SHALL BE MADE FOR THE REMOVALS, BUT SHALL BE INCLUDED IN THE WORK.

THE ROADWAY SHALL BE KEPT CLEAN BY SWEEPING DIRT PRIOR TO BEING OPENED TO VEHICLES. THE CONSTRUCTION SUBCONTRACTOR SHALL PERFORM ROADWAY CLEANING AS DIRECTED BY THE CITY, AS REQUIRED. ROADWAY CLEANING SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 626 MOBILIZATION.

THE CONSTRUCTION SUBCONTRACTOR, AT NO EXPENSE TO THE PROJECT, SHALL REPLACE SIGNS, DELINEATORS, AND/OR ANY OTHER STRUCTURES OR MARKERS DAMAGED BY THE WORK.

THE CONSTRUCTION SUBCONTRACTOR SHALL PROTECT WORK AREAS AND FACILITIES FROM WATER AND SHALL KEEP EXISTING DRAINAGE STRUCTURES FUNCTIONAL AND MAINTAIN DRAINAGE TO THOSE STRUCTURES.

ANY LANDSCAPED, IRRIGATED OR PAVED AREAS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONSTRUCTION SUBCONTRACTOR TO PRE-CONSTRUCTION CONDITION AT NO EXTRA COST TO THE PROJECT.

STRUCTURE EXCAVATION AND BACKFILL LIMITS HAVE NOT BEEN ESTIMATED FOR THIS 30 PERCENT DESIGN PACKAGE, BUT WILL BE REQUIRED AS PART OF THE WORK AND SHALL BE INCLUDED IN ITEM 202 REMOVAL OF BRIDGE.

THE CONSTRUCTION SUBCONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT OF THE EXISTING CONCRETE RETAINING WALLS DURING THE PROJECT. TEMPORARY SUPPORT WORK SHALL BE PAID FOR BY ITEM 206 TEMPORARY SUPPORT.

THE CONSTRUCTION SUBCONTRACTOR SHALL COORDINATE WITH THE CITY FOR SITE ACCESS AND FOR ANY REQUIREMENTS DURING CONSTRUCTION PRIOR TO MOBILIZING TO THE SITE.

THE CONSTRUCTION SUBCONTRACTOR MAY BE REQUIRED TO MAINTAIN PEDESTRIAN ACCESS FOR RESIDENTS FOR THE DURATION OF THE PROJECT. THE CONSTRUCTION SUBCONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY FOR REVIEW AND APPROVAL.

TECHNICAL SPECIFICATION GENERAL NOTES

THE FOLLOWING NOTES ARE INTENDED TO PROVIDE GENERAL GUIDANCE FOR CONDUCTING THE REQUIRED WORK, AND ARE NOT TO BE CONSIDERED AS THE FINAL SPECIFICATIONS. THE CITY SHALL CONFIRM ALL REQUIREMENTS FOR THE FINAL WORK THAT IS TO BE PERFORMED. REFER TO SEPARATE INFORMATION FOR THE SPECIFICATIONS FOR THE EXISTING BRIDGE DEMOLITION WORK.

ALL WORK REQUIRED FOR THE PROJECT SHALL BE IN ACCORDANCE WITH THE 2011 EDITION OF THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT), STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE CDOT M&S STANDARDS, LATEST EDITIONS, IN EFFECT AT TIME OF BID. REFERENCE TO MANUALS OR PUBLICATIONS SHALL STILL PERTAIN TO THE COLORADO DEPARTMENT OF TRANSPORTATION.

IN THE STANDARD SPECIFICATIONS (INCLUDING TECHNICAL SPECIFICATION NOTES INCLUDED BELOW), WHEN REFERENCE IS MADE TO "CDOT", "THE DEPARTMENT", "TRANSPORTATION DIRECTOR", "CHIEF ENGINEER" OR "THE ENGINEER" IT SHALL MEAN THE CITY OF MANITOU SPRINGS (CITY) OR THEIR AUTHORIZED REPRESENTATIVE. WHEN REFERENCE IS MADE TO THE "CONTRACTOR" IT SHALL MEAN THE CONSTRUCTION SUBCONTRACTOR.

PERFORMANCE OF SAFETY CRITICAL WORK

SECTION 107 OF THE STANDARD SPECIFICATIONS IS HEREBY REVISED FOR THIS PROJECT AS FOLLOWS:

ADD SUBSECTION 107.061 TO INCLUDE THE FOLLOWING:

THE FOLLOWING WORK ELEMENTS ARE CONSIDERED SAFETY CRITICAL WORK FOR THIS PROJECT:

(1) WORK REQUIRING THE USE OF CRANES OR OTHER HEAVY LIFTING EQUIPMENT
(2) REMOVAL OF EXISTING BRIDGE
(3) WALL CONSTRUCTION

WHEN ORDERED BY THE CITY, THE CONTRACTOR SHALL IMMEDIATELY STOP SAFETY CRITICAL WORK THAT IS BEING PERFORMED IN AN UNSAFE MANNER OR WILL RESULT IN AN UNSAFE SITUATION FOR THE TRAVELING PUBLIC. THE CONTRACTOR SHALL REMOVE WORKERS FROM THE PROJECT THAT ARE PERFORMING THE SAFETY CRITICAL WORK IN A MANNER THAT CREATES AN UNSAFE SITUATION FOR THE PUBLIC.

THE CONTRACTOR SHALL SUBMIT, FOR RECORD PURPOSES ONLY, A DETAILED CONSTRUCTION PLAN THAT ADDRESSES SAFE CONSTRUCTION OF EACH OF THE SAFETY CRITICAL ELEMENTS. THE DETAILED CONSTRUCTION PLAN SHALL BE SUBMITTED TWO WEEKS PRIOR TO COMMENCING THE WORK. THE CONSTRUCTION PLAN SHALL BE STAMPED "APPROVED FOR CONSTRUCTION" AND SIGNED BY THE CONTRACTOR. THE CONSTRUCTION PLAN WILL NOT BE APPROVED BY THE CITY. THE CONTRACTOR'S ENGINEER SHALL SIGN AND SEAL TEMPORARY WORKS, SUCH AS FALSEWORK, SHORING ETC., RELATED TO CONSTRUCTION PLANS FOR THE SAFETY CRITICAL ELEMENTS.

ALL COSTS ASSOCIATED WITH THE PREPARATION AND IMPLEMENTATION OF EACH SAFETY CRITICAL ELEMENT CONSTRUCTION PLAN WILL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.

NOTHING IN THE PLAN SHALL BE CONSTRUED TO RELIEVE THE CONTRACTOR FROM ULTIMATE LIABILITY FOR UNSAFE OR NEGLIGENT ACTS OR TO BE A WAIVER OF THE COLORADO GOVERNMENTAL IMMUNITY ACT ON BEHALF OF THE CITY.

THE CONSTRUCTION PLAN SHALL INCLUDE THE FOLLOWING:

(1) SAFETY CRITICAL ELEMENT FOR WHICH THE PLAN IS BEING PREPARED AND SUBMITTED.
(2) CONTRACTOR OR SUBCONTRACTOR RESPONSIBLE FOR THE PLAN PREPARATION AND THE WORK.
(3) SCHEDULE, PROCEDURES, EQUIPMENT, AND SEQUENCE OF OPERATIONS, THAT COMPLY WITH THE WORKING HOUR LIMITATIONS (TO BE SUPPLIED BY THE CITY)
(4) TEMPORARY WORKS REQUIRED: FALSEWORK, BRACING, SHORING, ETC.
(5) ADDITIONAL ACTIONS THAT WILL BE TAKEN TO ENSURE THAT THE WORK WILL BE PERFORMED SAFELY.
(6) NAMES AND QUALIFICATIONS OF WORKERS WHO WILL BE IN RESPONSIBLE CHARGE OF THE WORK:
   A. YEARS OF EXPERIENCE PERFORMING SIMILAR WORK
   B. TRAINING TAKEN IN PERFORMING SIMILAR WORK
   C. CERTIFICATIONS EARNED IN PERFORMING SIMILAR WORK
(7) NAMES AND QUALIFICATIONS OF WORKERS OPERATING CRANES OR OTHER LIFTING EQUIPMENT:
   A. YEARS OF EXPERIENCE PERFORMING SIMILAR WORK
   B. TRAINING TAKEN IN PERFORMING SIMILAR WORK
   C. CERTIFICATIONS EARNED IN PERFORMING SIMILAR WORK
(8) THE CONSTRUCTION PLAN SHALL ADDRESS HOW THE CONTRACTOR WILL HANDLE CONTINGENCIES SUCH AS:
   A. UNPLANNED EVENTS (STORMS, TRAFFIC ACCIDENTS, ETC.)
   B. STRUCTURAL ELEMENTS THAT DON'T FIT OR LINE UP
   C. WORK THAT CANNOT BE COMPLETED IN TIME FOR THE ROADWAY TO BE REOPENED TO TRAFFIC
   D. REPLACEMENT OF WORKERS WHO DON'T PERFORM THE WORK SAFELY
   E. EQUIPMENT FAILURE
   F. OTHER POTENTIAL DIFFICULTIES INHERENT IN THE TYPE OF WORK BEING PERFORMED
(9) NAME AND QUALIFICATIONS OF CONTRACTOR'S PERSON DESIGNATED TO DETERMINE AND NOTIFY THE CITY IN WRITING WHEN IT IS SAFE TO OPEN A ROUTE TO TRAFFIC AFTER IT HAS BEEN CLOSED FOR SAFETY CRITICAL WORK.
(10) METHODS TO SAFELY SEPARATE PEDESTRIANS FROM THE CONSTRUCTION AREAS.

SHOULD AN UNPLANNED EVENT OCCUR, THE CONTRACTOR SHALL IMMEDIATELY CEASE OPERATIONS ON THE SAFETY CRITICAL ELEMENT, EXCEPT FOR PERFORMING ANY WORK NECESSARY TO ENSURE WORKSITE SAFETY, AND PROVIDE PROPER PROTECTION OF THE WORK AND THE TRAVELING PUBLIC. IF THE CONTRACTOR INTENDS TO MODIFY THE SUBMITTED PLAN, HE SHALL SUBMIT A REVISED PLAN TO THE ENGINEER PRIOR TO RESUMING OPERATIONS.

CONSTRUCTION ZONE TRAFFIC CONTROL

SECTION 630 OF THE STANDARD SPECIFICATIONS IS HEREBY REVISED FOR THE PROJECT AS FOLLOWS:

IN SUBSECTION 630.10(a) THE FIRST PARAGRAPH, DELETE THE FIRST SENTENCE AND REPLACE WITH THE FOLLOWING:

THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN (TCP) FOR THE PROJECT TO THE CITY FOR APPROVAL. THE CONTRACTOR SHALL CONTROL TRAFFIC IN ACCORDANCE WITH THE TCP, ONCE APPROVED BY THE CITY.

SUBSECTION TO 630.10(a) SHALL INCLUDE THE FOLLOWING:

(10) THE KEY ELEMENTS OF THE CONTRACTOR'S METHOD OF HANDLING TRAFFIC (MHT) ARE OUTLINED IN SUBSECTION 630.10(a). THE COMPONENTS FOR THE TCP FOR THIS PROJECT SHALL USE THE FOLLOWING REQUIREMENTS:

(1) SUBSECTION 104.04 AND SECTION 630 OF THE STANDARD SPECIFICATIONS.
(2) M&S STANDARD PLAN S-630-1, TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION, AND STANDARD PLAN S-630-2.

Print Date: 8/29/2016
File Name: 02_Gen_Notes.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information

amec foster wheeler

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Sheet Revisions		
Date:	Comments	Init.

City of Manitou Springs
606 Manitou Avenue
Manitou Springs, CO 80829

30% Design
No Revisions:
Revised:
Void:

GENERAL NOTES

Designer: J. Forbes
Detailer: J. Forbes
Sheet Subset:
Structure Numbers
Subset Sheets: 02 of 06

Project No.
32790066
BROOK STREET BRIDGE DEMOLITION
Sheet Number 2

UTILITY GENERAL NOTES

THE EXISTING UTILITIES ARE NOT SHOWN ON THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.

THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITIES AT LEAST THREE (3) BUSINESS DAYS, NOT INCLUDING THE ACTUAL DAY OF NOTICE, PRIOR TO COMMENCING SUCH OPERATIONS. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AT 811 OR 1-800-922-1987, TO HAVE LOCATIONS OF UNCC REGISTERED LINES MARKED BY MEMBER COMPANIES. ALL OTHER UNDERGROUND FACILITIES SHALL BE LOCATED BY CONTACTING THE RESPECTIVE OWNER. UTILITY SERVICE LATERALS SHALL ALSO BE LOCATED PRIOR TO BEGINNING EXCAVATION OR GRADING.

THE CONTRACTOR SHALL VERIFY AND DOCUMENT THE CONDITION OF EXISTING UTILITIES (VISIBLE FACILITIES) WITH THE CITY AND REPRESENTATIVES FROM THE UTILITY COMPANIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.

THE CONTRACTOR SHALL BE ADVISED THAT OVERHEAD POWER LINES ARE PRESENT IN THE PROJECT. THE CONTRACTOR SHOULD USE CAUTION WHEN OPERATING EQUIPMENT IN THE VICINITY OF OVERHEAD POWER LINES.

EVERY REASONABLE MEANS SHALL BE USED, INCLUDING FIELD LOCATION OF THE UTILITY USING WHATEVER PROSPECTING MEANS ARE NECESSARY. THE CONTRACTOR ASSUMES RESPONSIBILITY FOR THE PROTECTION OF ALL UTILITIES DURING THE WORK, AND SHALL HOLD MANITOU SPRINGS AND ITS CONSULTANTS HARMLESS FOR ANY AND ALL DAMAGES TO UTILITIES ARISING FROM CONSTRUCTION OPERATIONS.

811

FOR BURIED UTILITY INFORMATION
THREE (3) BUSINESS DAYS
BEFORE YOU DIG
CALL 811
(or 1-800-922-1987)
UTILITY NOTIFICATION
CENTER OF COLORADO (UNCC)
www.uncc.org

SUMMARY OF QUANTITIES

	ITEM NO.	DESCRIPTION	UNIT	PROJECT QUANTITY	TOTAL
	201	Vegetation Removal	LS	1	1
(3)	202	Removal of Bridge	EA	1	1
	202	Remove and Redirect 24 inch Drain Pipe	EA	1	1
	206	Temporary Support	LS	1	1
	208	Water Control including Compliance with Construction Dewatering COG070000	LS	1	1
	210	Reconfigure and Extend Existing 16 inch RCP Outlet	EA	1	1
(1)	504	Soil Nail Wall (North Creek Side)	SF	450	450
(1)	504	Soil Nail Wall (South Creek Side)	SF	290	290
(2)	506	Riprap	CY	80	80
	614	Post Construction Fixed Barricade (North Creek Side)	EA	1	1
	614	Post Construction Fixed Barricade (South Creek Side)	EA	1	1
	625	Construction Surveying	LS	1	1
	626	Mobilization	LS	1	1
	630	Traffic Control	LS	1	1
		Safety Critical Work Plan	LS	1	1
		Payment and Performance Bonds	LS	1	1
		404 Permit Compliance	LS	1	1
		Staging Area Rent	LS	1	1
		Stormwater Management Plan Preparation and Compliance	LS	1	1
		Miscellaneous Grading, Construction and other Services to Complete Subcontractor Work	LS	1	1

NOTES:

(1) The final wall type, layout and heights are to be determined during final design. This 30% level design has assumed a soil nail wall type along the layouts as shown on the drawings with a height of 12 feet for quantity purposes. See notes on Sheet 6 for additional information.

(2) The limits of the riprap shown on the drawings has been assumed for quantity purposes. A minimum thickness of 2.5 feet was developed as part of a slope stability analysis.

(3) Excavation and backfilling will be required as part of the work and shall be included in Item 202 Removal of Bridge.

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Print Date: 8/29/2016
File Name: 03_Gen_Notes-SDQ.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information

amec foster wheeler

R-X

Sheet Revisions		
Date:	Comments	Init.

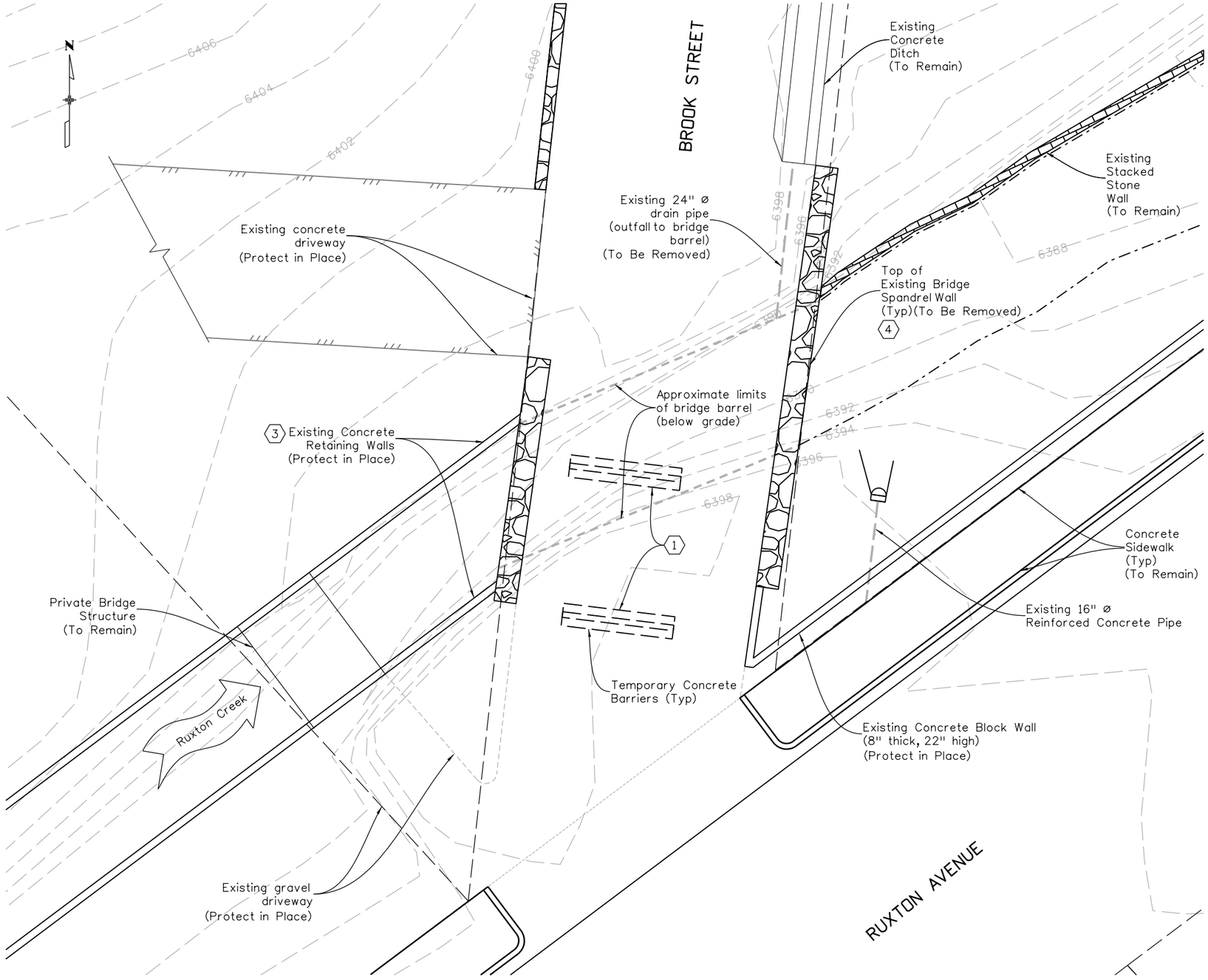
City of Manitou Springs
606 Manitou Avenue
Manitou Springs, CO 80829

30% Design
No Revisions:
Revised:
Void:

GENERAL NOTES AND SUMMARY OF QUANTITIES

Designer: J. Forbes
Detailer: J. Forbes
Sheet Subset:
Structure Numbers:
Subset Sheets: 03 of 06

Project No.
32790066
BROOK STREET BRIDGE DEMOLITION
Sheet Number 3



NOTES:

1. The existing temporary concrete barrier blocks will be removed by the City concurrently with the Construction Subcontractor mobilizing to the site.
2. The information shown on the drawings is approximate and is not based on survey information. The City will provide a preconstruction survey prior to the Construction Subcontrator mobilizing to the site to verify all contours, plan information and any dimensions provided in the drawing package.
3. The Construction Subcontractor shall temporary brace and shore the existing walls (and slopes where required) before commencing any demolition, excavation and backfilling activities to protect adjacent property. No excavation is permitted behind existing concrete retaining walls. Bracing will be paid for in accordance with the specifications, Item 206 Temporary Support.
4. The limits of the bridge demolition are not shown and shall be determined by the Construction Subcontractor. Refer to the specifications for additional requirements during the bridge removal.

LEGEND:

- 2 — 6430 — Existing Grade Contour (2-ft)
- Parcel Boundary
- Buried Drainage Pipe
- Edge of Existing Paved Driveway
- Existing Stone Masonry Bridge

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Print Date: 8/29/2016			
File Name: 04_Existing_Demo_Plan.dgn			
Horiz. Scale: 1:10	Vert. Scale: As Noted		
Unit Information			
amec foster wheeler			

R-X 0000

Sheet Revisions

Date:	Comments	Init.

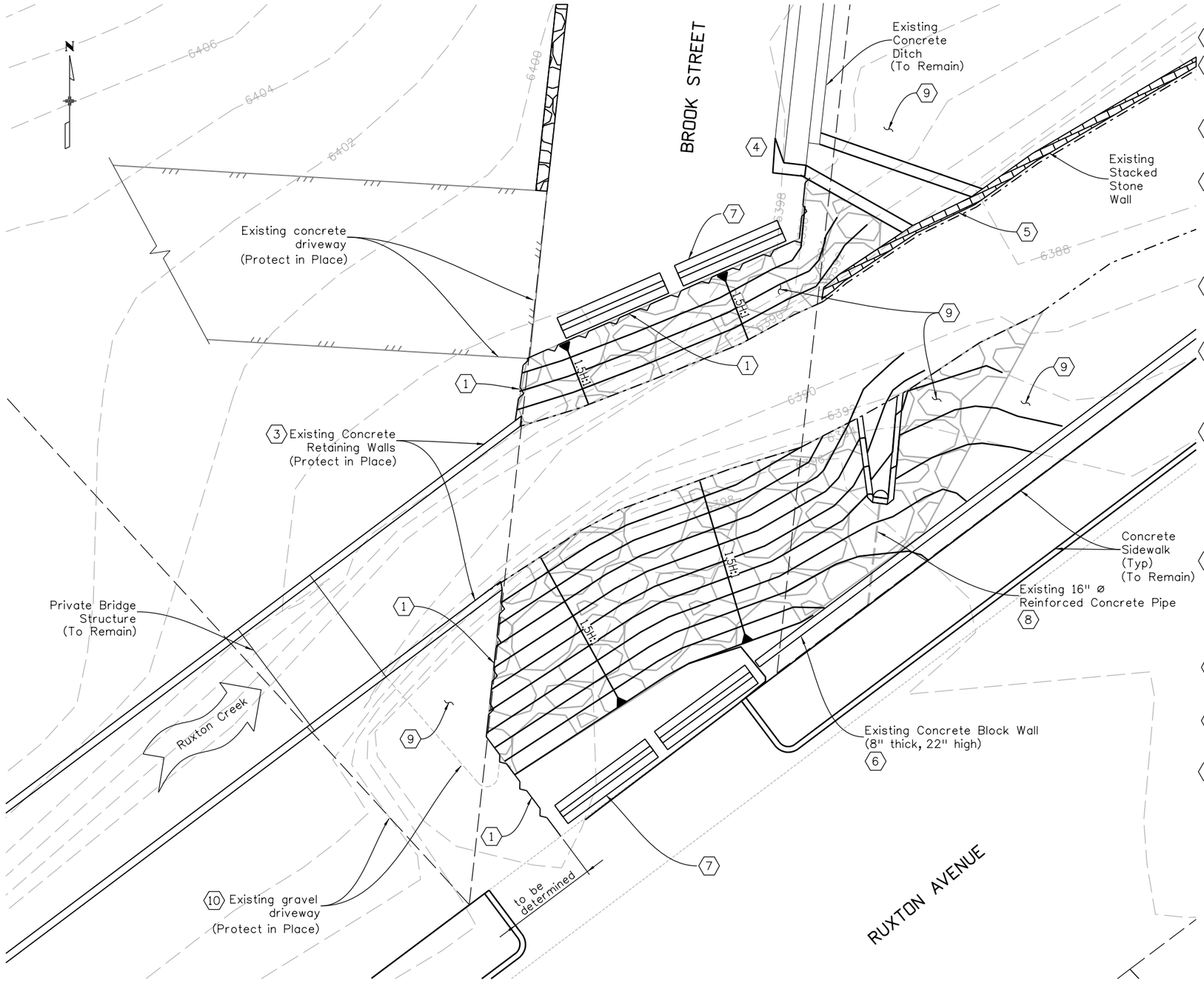
City of Manitou Springs
606 Manitou Avenue
Manitou Springs, CO 80829

30% Design	
No Revisions:	
Revised:	
Void:	

EXISTING SITE CONDITIONS

Designer:	J. Forbes	Structure Numbers	
Detailer:	J. Forbes		
Sheet Subset:		Subset Sheets:	04 of 06

Project No.	32790066
BROOK STREET BRIDGE DEMOLITION	
Sheet Number	4



NOTES:

1. New retaining wall. See Sheet 6 for information.
2. The information shown on the drawings is approximate and is not based on survey information. The City shall provide a preconstruction survey prior to mobilizing to the site to verify all contours, plan information and any dimensions provided in the drawing package.
3. Temporary brace the existing walls as needed. Bracing will be paid for in accordance with the specifications, Item 206 Temporary Support.
4. The Construction Subcontractor shall remove the existing 24 inch diameter drain pipe as part of the work. The Construction Subcontractor shall construct an outfall for the drainage ditch to drain into Ruxton Creek. The final alignment and outfall type shall be coordinated with the City. The pipe removal and new outfall construction shall be paid for in accordance with the specifications, Item 202 Remove and Redirect 24 inch Drain Pipe.
5. The Construction Subcontractor shall minimize damage to the existing stacked stone wall located along the creek edge when placing new drainage outfall. The stacked stone wall height varies, and is approximately 3 feet high at the bridge connection.
6. The Construction Subcontractor shall remove a portion of the existing concrete block wall to remove the existing stone masonry bridge. The limits of the wall removal shall be coordinated with the City. The wall removal shall not be paid for separately, but shall be paid for in accordance with the specifications, Item 202 Bridge Removal.
7. The Construction Subcontractor shall coordinate a new barrier system and requirements with the City to be placed at both ends of Brook Street upon completion of construction. Refer to Sheet 7, CDOT M&S Drawing S-630-2, Barricades, Drums, Concrete Barriers (Temp) & Vertical Panels, Typical Type 3 Barricades, Fixed Detail. Warning Lights shall not be included on the barricades. The new barrier systems shall be paid for in accordance with the specifications, Item 614 Post Construction Fixed Barricade (North Creek Side) and Item 614 Post Construction Fixed Barricade (South Creek Side).
8. The proposed grading shown on the drawings is approximate. The limits of construction is not shown and shall be determined during final design and construction. If the construction limits extend to the location of the existing 16" diameter pipe, the Construction Subcontractor shall determine means to protect, or replace the drainage pipe. The pipe protection or replacement shall be paid for in accordance with the specifications, Item 210 Reconfigure and Extend Existing 16 inch RCP Outlet.
9. Areas of vegetation are not shown on the drawings. The Construction Subcontractor shall coordinate with the City for limits of vegetation removal and any proposed tree removals prior to commencing work.
10. Existing driveway shall be closed for vehicular access during construction. The Construction Subcontractor shall coordinate with the City to define pedestrian access requirements.
11. The Construction Subcontractor shall place a minimum of 2.5-ft thick riprap on all exposed slopes and blend into existing grades. The size and type of rock shall be determined during design.

LEGEND:

- 6430 — Existing Grade Contour (2-ft)
- **6430** — Proposed Grade Contour (1-ft)
- Parcel Boundary
- Buried Drainage Pipe
- Edge of Existing Paved Driveway
- Riprap

jennifer.forbes 1:39:36 PM W:\32790066 - Brook Street Bridge Demolition\9.0 CADD\9.1 Drawings\05_Final_Site_Plan.dgn

Print Date: 8/29/2016			
File Name: 05_Final_Site_Plan.dgn			
Horiz. Scale: 1:10	Vert. Scale: As Noted		
Unit Information			
amec foster wheeler			

R-X 0008

Sheet Revisions

Date:	Comments	Init.

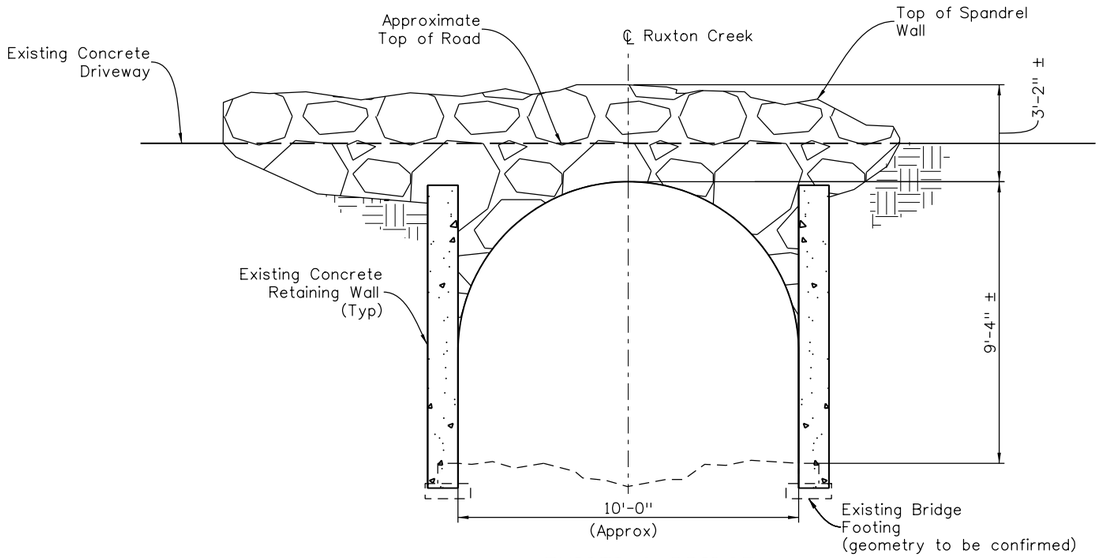
City of Manitou Springs
606 Manitou Avenue
Manitou Springs, CO 80829

30% Design	
No Revisions:	
Revised:	
Void:	

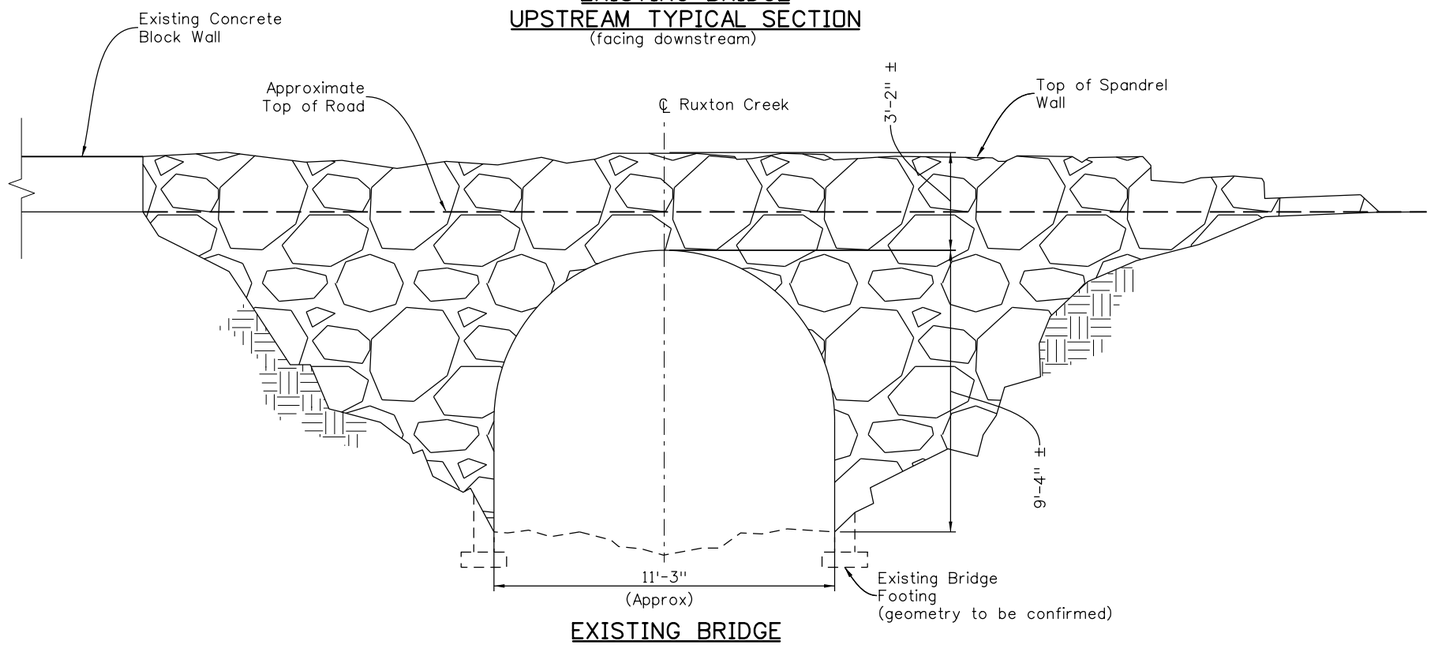
FINAL SITE PLAN

Designer:	J. Forbes	Structure Numbers	
Detailer:	J. Forbes		
Sheet Subset:		Subset Sheets:	05 of 06

Project No.	
32790066	
BROOK STREET BRIDGE DEMOLITION	
Sheet Number	5



EXISTING BRIDGE
UPSTREAM TYPICAL SECTION
(facing downstream)



EXISTING BRIDGE
DOWNSTREAM TYPICAL SECTION
(facing upstream)

DEMOLITION NOTES:

1. The existing bridge footing depths and dimension shown are approximate. The Construction Subcontractor shall remove all stone masonry to the top of the existing footings, and the existing footings shall remain in place. The Construction Subcontractor shall verify the plan limits of the existing footing as part of the demolition work, or as directed by the City. The plan dimensions of the existing footings shall be surveyed and included in the as-built information provided at the end of the project. Existing footing survey work shall be included in Item 625 Construction Surveying.

RETAINING WALL NOTES:

1. The Design-Build Prime Contractor shall be responsible for the final design of the walls. The Design-Build Prime Contractor shall provide final drawings and specifications signed and sealed by an Engineer registered in the State of Colorado. The walls shall be constructed in accordance with the stamped plans and specifications.

2. The final wall type, layout and heights are subject to change and shall be based on a structural design completed the Design-Build Prime Contractor. The soil nail wall type was assumed for 30% design based on available information and construction constraints, but may not be feasible, depending on site conditions. As-built information for the existing concrete retaining walls was not available at this design stage, and these walls may have anchors. Other wall assumptions are the wall face shall consist of a shotcrete facing system, the anchors may be spaced at 5 feet on center, three rows of anchors will be required, and the anchors may be up to 20 feet long. The design assumptions are general and will be adjusted during design.

3. After geotechnical information has been provided, the wall design shall be finalized. Other considered wall types include, but are not limited to, cast-in-place concrete walls, soldier pile or sheet pile walls.

4. The wall calculations shall include the design of the connection to the existing upstream concrete walls.

5. The Construction Subcontractor shall perform a geotechnical investigation during the excavation work. The Construction Subcontractor shall coordinate with the City for requirements to determine the subsurface profile and material properties of the site soils to develop load conditions and to complete the wall design.

Print Date: 8/29/2016
File Name: 06_Details.dgn
Horiz. Scale: 1:5 Vert. Scale: As Noted
Unit Information

amec foster wheeler

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Sheet Revisions		
Date:	Comments	Init.

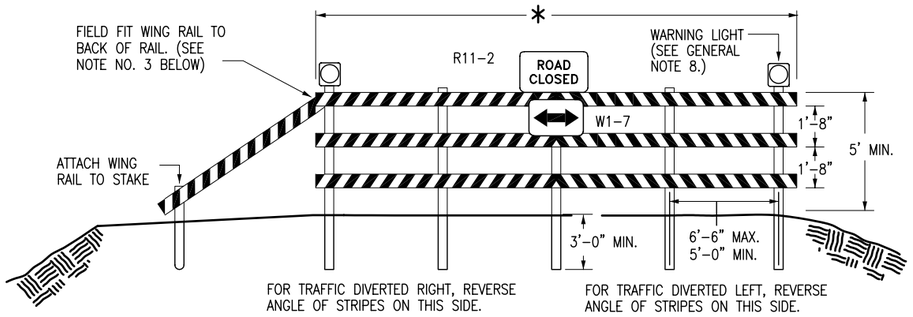
City of Manitou Springs
606 Manitou Avenue
Manitou Springs, CO 80829

30% Design
No Revisions:
Revised:
Void:

DETAILS

Designer: J. Forbes
Detailer: J. Forbes
Sheet Subset:
Structure Numbers
Subset Sheets: 06 of 06

Project No.
32790066
BROOK STREET BRIDGE DEMOLITION
Sheet Number 6



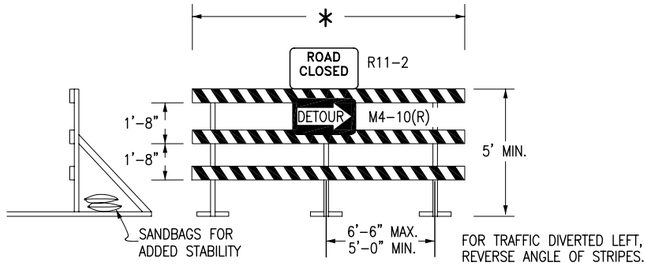
FIXED

* RAIL LENGTH TABLE

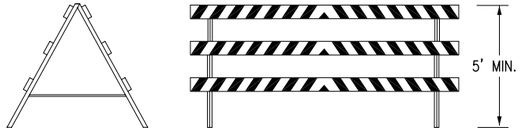
TYPE 3 BARRICADE		LENGTH
FIXED	MOVABLE	
F – A	M – A	8'– 14'
F – B	M – B	15'– 24'
F – C	M – C	25'– 35'
F – D	M – D	> 35'

NOTES

1. TYPE 3 BARRICADES HAVE 3 REFLECTORIZED RAIL FACES IF FACING TRAFFIC IN ONE DIRECTION AND 6 IF FACING TRAFFIC IN TWO DIRECTIONS.
2. THE PORTION OF THE POST ABOVE THE GROUND LINE SHALL BE PAINTED IN ACCORDANCE WITH THE APPROPRIATE GENERAL NOTE.
3. DETACHABLE EXTENSION WING RAILS FOR BYPASSING OF CONSTRUCTION EQUIPMENT ARE PERMITTED, WHEN NECESSARY, ON FIXED OR MOVABLE TYPE 3 BARRICADES. THE LENGTH SHALL BE ADEQUATE TO CLOSE THE BORROW PIT AND/OR SHOULDER AS REQUIRED.



MOVABLE–SKIDS



MOVABLE–HINGED

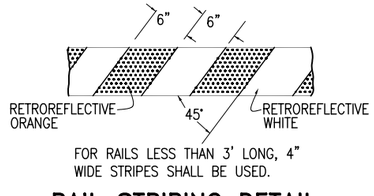
GENERAL NOTES

1. THE VARIOUS TYPES, COMBINATIONS AND APPLICATIONS OF SIGNS AND WARNING LIGHTS FOR BARRICADES REQUIRED FOR EACH PROJECT SHALL BE:
   A. AS SPECIFIED OR DETAILED IN THE PLANS.
   B. AS SHOWN IN APPLICABLE TYPICAL ILLUSTRATIONS.
   C. AS CALLED FOR AND SUBJECT TO APPROVAL BY THE ENGINEER.
2. TEMPORARY AND PERMANENT BARRICADES TYPE 3 SHALL BE FABRICATED FROM APPROVED CRASH TESTED MATERIALS. SEE SECTION 614 AND 630 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION FOR ADDITIONAL REQUIREMENTS.
3. ALL PAINTING SHALL CONFORM WITH THE FOLLOWING:
   A. THE APPLICABLE SECTION OF 508 OF THE STANDARD SPECIFICATIONS.
   B. ALL SKIDS, BRACES AND POSTS SHALL BE PAINTED WITH 2 COATS OF EXTERIOR WHITE PAINT
   C. THE BACKSIDES OF RAILS AND VERTICAL PANEL CHANNELIZING DEVICES FACING ONE DIRECTION OF TRAFFIC ONLY SHALL BE PAINTED WITH "EXTERIOR WHITE PAINT.
   D. ALUMINUM OR GALVANIZED STEEL SKIDS, BRACES AND POSTS SHALL NOT BE PAINTED.
4. ALL STRIPED SURFACES SHALL CONFORM WITH THE FOLLOWING:
   A. THE ENTIRE AREA OF ORANGE AND WHITE STRIPES SHALL BE FABRICATED AS ONE PIECE.
   B. HORIZONTAL RAILS, WING RAILS AND VERTICAL PANEL CHANNELIZING DEVICES SHALL HAVE ORANGE AND WHITE STRIPES ON THE FACE SIDE(S) SLANTING DOWNWARD AT A 45° ANGLE TOWARD THE SIDE(S) TO WHICH TRAFFIC IS TO PASS OR TURN.
   C. PERMANENT BARRICADES SHALL HAVE RETROREFLECTIVE RED AND WHITE STRIPES. THEY MAY BE USED AT LOCATIONS TO MARK THE END OF A ROAD, STREET OR HIGHWAY WHERE THERE IS NO CROSSROAD OR OUTLET. THEY SHALL NOT BE USED AT A "T" INTERSECTION.
   D. ALL RETROREFLECTIVE SHEETING SHALL CONFORM TO ASTM D4956:
      1. ORANGE AND WHITE SHALL BE TYPE II, III OR IV.
      2. RED AND WHITE SHALL BE TYPE II, III OR IV.
5. FOR ALL WOODEN BARRICADE COMPONENTS NOMINAL LUMBER DIMENSIONS ARE SATISFACTORY.
6. ALL SCREWS, BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED OR CADMIUM PLATED.
7. STABILITY OF BARRICADES AND CHANNELIZING DEVICES SHALL CONFORM WITH THE FOLLOWING:
   A. SKIDS (BASES) OF MOVABLE BARRICADES SHALL BE WEIGHTED WITH SANDBAGS ONLY WHERE NECESSARY TO PROVIDE STABILITY
   B. NO MOVABLE OR PORTABLE DEVICE SHALL BE WEIGHTED BY ANY METHOD OR WITH ANY MATERIAL THAT WOULD MAKE THEM HAZARDOUS TO MOTORISTS.
8. WARNING LIGHTS USED WITH BARRICADES, DRUMS AND VERTICAL PANELS SHALL CONFORM WITH THE FOLLOWING:
   A. USE FLASHING WARNING LIGHTS WHEN DEVICES ARE USED SINGLY, AND STEADY BURN LIGHTS WHEN THEY ARE USED IN A SERIES FOR CHANNELIZATION.
   B. THEY SHALL BE POSITIONED ABOVE THE TOP RAIL OF BARRICADES OR ON TOP OF DRUMS AND VERTICAL PANELS.
9. CONCRETE BARRIER (TEMPORARY) SHALL CONFORM WITH:
   A. PRECAST CONCRETE BARRIER AS SHOWN ON COLORADO STANDARD PLAN M-606-14.
   B. BARRIER REFLECTORS SHALL BE INSTALLED THAT MEET THE REQUIREMENTS OF STANDARD TYPICAL DELINEATOR INSTALLATIONS, EXCEPT THE MAXIMUM SPACING SHALL BE 50', AND THEY WILL NOT BE PAID FOR BUT ARE INCLUDED IN THE COST OF THE BARRIER.
   C. CONCRETE BARRIER END TREATMENT SHALL BE IN ACCORDANCE WITH CLEAR ZONE CRITERIA, AND PLACED AS SHOWN ON THE PLANS.
10. SIGN PANELS MOUNTED ON BARRICADES WILL BE PAID FOR SEPARATELY.

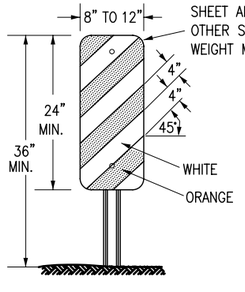
TYPICAL TYPE 3 BARRICADES

TYPICAL BARRICADE CHARACTERISTICS

	BARRICADE DESIGNATIONS
	TYPE 3
RAIL WIDTH	8"MIN.–12" MAX.
RAIL LENGTH	AS REQUIRED, SEE RAIL LENGTH TABLE
HEIGHT	5' MIN.
USE	TEMPORARY OR PERMANENT
STRIPES	SEE DETAIL OF BARRICADE STRIPING AND APPROPRIATE GENERAL NOTES.

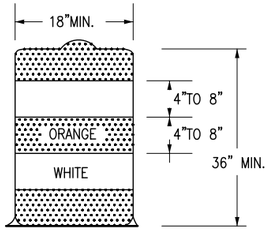


RAIL STRIPING DETAIL



1. IF SPECIAL PANELS 3' OR GREATER IN HEIGHT ARE REQUIRED, THEN 6" STRIPES SHALL BE USED.
2. IF FIXED PLACEMENT IS REQUIRED, MOUNT ON DELINEATOR POST. SEE COLORADO STANDARD PLAN S-612-1.

TYPICAL VERTICAL PANEL



1. THE 18" MINIMUM DIMENSION SHALL APPLY TO THE SMALLEST MEASUREMENT OF OBLONG, RECTANGULAR, OR FLATTENED SIDE DRUMS.
2. THERE SHALL BE AT LEAST TWO ORANGE AND TWO WHITE HORIZONTAL, CIRCUMFERENTIAL, RETROREFLECTIVE STRIPES ON EACH DRUM.

TYPICAL DRUM

Computer File Information	
Creation Date: 07-04-06	Initials: KCM
Last Modification Date: 07-04-06	Initials: JSW
Full Path:www.dot.state.co.us/DesignSupport/	
Drawing File Name: S-630-2 (1 of 1)	
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	

Sheet Revisions	
Date:	Comments

Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
4201 East Arkansas Avenue
Denver, Colorado 80222
Phone: (303) 757-9543
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Staff Traffic Branch KCM/JSW

BARRICADES, DRUMS, CONCRETE BARRIERS (TEMP) & VERTICAL PANELS

Issued By: Traffic Engineering Unit July 4, 2006

STANDARD PLAN NO.
S-630-2
Sheet No. 7

From the desk of:

Michelle Anthony, Senior Planner
606 Manitou Avenue
Manitou Springs, Colorado 80829

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www.manitouspringsgov.com

Memorandum

TO: Sara Hartley, CFM
Hazard Mitigation & Resiliency Manager

CC: Jason Wells, City Administrator
Wade Burkholder, Planning Director

FROM: Michelle Anthony, AICP
Senior Planner

DATE: November 17, 2016

RE: Proposed Mitigation Actions Addressing a Determination of Adverse Effect to the Manitou Springs Historic District from Demolition of the Brook Street Bridge

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The U.S. Army Corps of Engineers (Corps) and the State Historic Preservation Office (SHPO) have determined there will be an adverse effect to the Manitou Springs Historic District resulting from the removal of the Brook Street Bridge. Representatives from the City of Manitou Springs (City), the Corps, and the SHPO met on September 29, 2016, at the Office of Archeaology and Historic Preservation in Denver to discuss potential mitigation measures. This document serves to outline those measures and formally propose their approval toward the execution of a Memorandum of Agreement (MOA) between the City, the Corps, and the SHPO to ensure the mitigation occurs.

The proposed mitigation measures are:

1. During removal of the existing bridge, the stone with which it is constructed will be salvaged to the maximum extent possible.

2. The design of the new bridge will be reviewed and approved by the Manitou Springs Historic Preservation Commission (HPC) and comply with the City's goals to maintain the character and setting of the historic district.

3. The replacement bridge will utilize the salvaged stone in its construction and be designed to retain important features of the Brook Street Bridge, such as the arched opening over the creek, solid spandrel walls, and mid-span spandrel benches, which are features common to other historic bridges in Manitou Springs.

4. An interpretive plaque providing general historical information about the Brook Street Bridge will be installed at the site of the bridge replacement project.

5. A Quick Response (QR) code will be provided on the interpretive plaque to take the reader to a page on the City's website which features:

    - General and historical information on the City's historic bridges
    - Historic photos
    - Contemporary photos
    - Information regarding the City's efforts to repair and restore its historic bridges
    - The Brook Street Bridge section of this website will also include documentation regarding why the bridge was removed and photo-documentation of the removal process. This information will also highlight the efforts of the City to construct a new bridge that maintains the character and setting of the historic district. Photographs and information about the new bridge will be included once construction is completed.

    It should be noted the City has contacted the Manitou Springs Heritage Center in order to obtain the digital images and content from its Historic Bridges of Manitou Springs exhibit for use on the website.

    The City has also contacted professional photographer, Tim Plass, to request permission to use color photos of the historic bridges featured in the Heritage Center's exhibit on the website. If Mr. Plass denies this request, the City will contract another professional photographer to provide images for the website.

6. The City will create a walking tour of the historic bridges within the Manitou Springs Historic District and a virtual tour will be on the website.

7. The City is also proposing the following education components directed at younger audiences/students as part of the mitigation:

    - The City will provide content for the website developed specifically for a 5th Grade comprehension-level that explains how an arch bridge functions and why an arch bridge might fail. This content will include an interactive and downloadable exercise that takes students through the steps of building their own arch bridge.

    It should be noted the City has contacted Manitou Springs resident Steven Lowe regarding creation of the student content on the website. Mr. Lowe is an engineer, stone arch bridge expert, and engineering instructor. Should Mr. Lowe not be available to assist with this effort, the City will contract with another engineer/stone arch bridge expert to create this content.

    The City has also contacted Manitou Springs' resident, professional writer, and former teacher, Molly Wingate to assist with creating this content to ensure that it meets the applicable standards for classroom use. Ms. Wingate previously created the History Pockets Project for the Manitou Springs Heritage Center, which was designed for younger students.

Ms. Wingate will collaborate with local teachers in developing this content, which will also be provided to teachers at Manitou Springs District 14 and Colorado Springs District 11, and made available to any interested teacher in Colorado.

The above seven items will be completed per the following proposed timeframes:

ITEM	COMPLETION TIMEFRAME
• Bridge Demolition	within 90 days of MOA execution*
• Bridge Construction	by December 2017*
• Interpretive Plaque	at Completion of Bridge Construction
• Walking Tour	within 90 days of MOA execution
• Begin Website Development	within 120 days of MOA execution
o General Information	within 180 days of MOA execution
o Virtual Tour	within 210 days of MOA execution
o Brook Street Bridge information	
▪ Historical background	within 180 days of MOA execution
▪ Documentation on removal	within 30 days of demolition or within 180 days of MOA execution
▪ Documentation on new bridge	within 30 days of completion of construction of within 210 days of MOA execution
o Educational Components	within 270 days of MOA execution

*assumes contractor responsiveness to request for bids. Some of the above items, such as the documentation of removal and on the new bridge, rely on completion of those items within the stated timeframes. The intention is to have all tasks completed no later than 12 months after MOA execution.