PROJECT DESCRIPTION:
ZAYO/CDOT FIBER BACKBONE, MILEPOST SECTION MP206 - MP226 (PHASE 4).
PULL 144 MICROFIBER AND 288 MICROFIBER THRU EXISTING DUCT BANK.
ROUTE SPANS 54,559 FT AND PLACED
20 EXISTING ZAYO HAND HOLES/8 EXISTING NEMA RATED CABINETS
ADJACENT TO EXISTING CDOT PULL BOXES/MAN HOLES/HAND HOLES.

PERMIT(S) REQUIRED/MILE POSTS/SHEET #5:
CDOT / MP 205.86-215.84 / SHTS 21-58
NFS (WHITE RIVER) / MP 205.86-214 / SHTS 21-33
NFS (ARAPAHOE) / MP 214-215.84 / SHTS 33-58
EISENHOWER TUNNEL / MP 213.60-215.27 / SHTS 31-37

PROJECT NAME: I-70 FIBER BACKBONE PROJECT - GLENWOOD SPRINGS TO GOLDEN, COLORADO

DRAWN BY: DREW PAPPAS    ISSUE DATE: 2/18/2021
PHONE: 970-980-6574    ISSUE #: 1    PHASE: 4
E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM    SCALE: 1" = 100'

PRINT ON TABLOID/ANSI B

001 OF 063
DESIGN TYPICAL 1 - HANDHOLE PLACEMENT (NO FLOW FILL)

Existing vacant CDOT 1.25” or 2” inner duct

Install ZAYO 1.25” SDR11 Conduit

Existing vacant 1.25” or 2” inner duct to be removed and rerouted

Install 1.25” ZAYO SDR11 Conduit.

Install (3) ZAYO microducts for microfiber (Orange, Green, Brown). Place ZAYO 288 microfiber in orange duct.

24”x36”x24” CDOT Vault Box or 48”x48”x48” Manhole (approx.) WITHOUT flow fill surrounding

Install * coil of CDOT 144 microfiber in 10 mm ID/12 mm OD plus microduct for CDOT USE ONLY

* COIL LENGTH
- 50’ in Handhole
- 100’ in Manhole

Existing vacant CDOT 1.25” or 2” inner duct

Install 1.25” ZAYO SDR11 Conduit.

Install ZAYO 1.25” SDR11 Conduit.

Install 30”x48x36” ZAYO Fiber Handhole

Install ZAYO mechanical protection box and place 60’ coil of ZAYO 288 microfiber into mechanical protection box.

NOTES:
- ALL CDOT TRACER WIRE MUST REMAIN IN PLACE OR BE RELOCATED TO OTHER SPARE DUCT.
- PLUG ALL DUCTS, MICRODUCTS, AND CONDUIT. (PER CDOT)

PROJECT NAME: 70 BACKBONE FIBER—GLENWOOD TO GOLDEN, COLORADO (PHASE 3)

DRAWN BY: DREW PAPPAS

PHONE: 970-980-6674

E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM

SCALE: NTS

DESIGN TYPICAL # 1

HQ - ITS BRANCH

JJS

SHEET #: 005 OF 063

Colorado Department of Transportation

4250 Corporate Circle
Golden, CO 80401
Phone: 303-512-5801
Fax: 303-512-5878
DESIGN TYPICAL 2 - HANDHOLE PLACEMENT (TO BE USED FOR HANDHOLES ENCASED IN OR ADJACENT TO ASPHALT AND NO OTHER TYPICAL CAN BE USED)

Install 1" coil of CDOT 144 microfiber in 10 mm ID/12 mm OD blue microduct for CDOT USE ONLY
* COIL LENGTH
  - 50' in Handhole
  - 100' in Manhole
Install ZAYO "Y" coupler

Existing CDOT 1.25" ID interduct.

Existing CDOT 1.25" ID interduct.

Install ZAYO 1.25" SDR11 Conduit E/W (3) 10 mm ID/12 mm OD microduct (11) each of orange, green, brown and ZAYO 288 microfiber in orange microduct.
Install ZAYO 1.25" SDR11 Conduit

24"x36"x24" CDOT Vault Box or 48"x48"x48" Manhole (approx.) WITH flow fill surrounding

Install ZAYO "Y" coupler
Concrete flow fill

NOTES:
- ALL CDOT TRACER WIRE MUST REMAIN IN PLACE OR BE RELOCATED TO OTHER SPARE DUCT.
- PLUG ALL DUCTS, MICRODUCTS, AND CONDUIT (PER CDOT)

PROJECT NAME: I-70 BACKBONE FIBER---GLENWOOD TO GOLDEN, COLORADO (PHASE 4)
DRAWN BY: DREW PAPPAS
DATE: 2/18/2021
PHONE: 970-980-6574
E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM
SCALE: NTS

DESIGN TYPICAL # 2
DESIGN TYPICAL 5 (OVERSET EXISTING DUCT)

CAUTION! Be sure conduit is vacant.

Install mechanical protection box in new ZAYO handhole. Place 60' coil of ZAYO orange microduct E/W ZAYO 288 microfiber, green microduct, and brown microduct.

Install ZAYO "Y" coupler

Install ZAYO 1.25" SDR11 Conduit.

Install 30"x48x36" ZAYO Fiber Handhole

Existing CDOT 1.25" SDR11 innerduct

Expose existing vacant CDOT 1.25" innerduct. Cut open and pull 4 microducts into handhole. Pull blue CDOT microduct into new CDOT vault box.

Install ZAYO 1.25" SDR11 Conduit.

Install ZAYO 1.25" SDR11 Conduit.

Install 50' coil of CDOT blue microduct E/W CDOT 144 microfiber.

Install CDOT Pop-Up Poly-Dome fiber marker post

NOTES:
- ALL CDOT TRACER WIRE MUST REMAIN IN PLACE OR BE RELOCATED TO OTHER SPARE DUCT.
- PLUG ALL DUCTS, MICRODUCTS, AND CONDUIT.

Place 24"x36"x24" CDOT Vault Box WITH flow fill surrounding

Design typical # 5

Project Name: 70 Backbone Fiber - Glenwood to Golden, Colorado (Phase 4)

Drawn By: Drew Pappas

Phone: 970-980-6574

E-mail: drew.pappas@bonfire-ec.com

Scale: 1" = 100'

DATE: 2/18/2011

Issue #: 1

Colorado Department of Transportation

4200 Corporate Circle
Golden, CO 80401
Phone: 303-512-5801
Fax: 303-512-5878

JPS

Sheet #: 009

OF 083
DESIGN TYPICAL # 6 (PULL STRAIGHT THROUGH)

- Pull (4) microducts (blue, orange, green, brown) straight through CDOT pull box.
- Blue microduct E/W CDOT 144 microfiber
- Orange microduct E/W ZAYO 288 microfiber

NOTES:
- ALL CDOT TRACER WIRE MUST REMAIN IN PLACE OR BE RELOCATED TO OTHER SPARE DUCT.
- PLUG ALL DUCTS, MICRODUCTS, AND CONDUIT (PER CDOT)

Existing CDOT 1.25"/2"/6" duct.

CDOT 24"x30"x24" pull box, surface-mounted pull box (bridge or tunnel), or CDOT 48"x48" manhole (approx.)

Install new ZAYO 1.25 OR 2" duct inside vault to shield microduct and microfiber.

Existing CDOT 1.25"/2"/6" duct.
DESIGN TYPICAL #8 (EISENHOWER TUNNEL)

Zayo 2" electrical conduit
Running between CDOT cabinet and ventilation duct wall (to new Zayo cabinet)

Approx 10' west of existing CDOT J Box
Install Zayo orange, green and brown microduct and return to the same existing CDOT J Box after coiling 288 microfiber in new Zayo NEMA rated cabinet.
Install orange microduct E/W the Zayo 288 microfiber.

Existing CDOT 3" electrical conduit
Existing CDOT 1.5" electrical conduit
Existing CDOT 1.25" electrical conduit

Mount new 36"x36"x11" Zayo NEMA cabinet using unistruts to the north wall of the EB Ventilation Duct.
Coil 60' of Zayo 288 microfiber only. DO NOT COIL microduct (orange, green, or brown).

CDOT 2" electrical conduit
CDOT NEMA CAB

Looking West

Looking North

NOTES:
- ALL CDOT TRACER WIRE MUST REMAIN IN PLACE OR BE RELOCATED TO OTHER SPARE DUCT.
- PLUG ALL DUCTS, MICRODUCTS, AND CONDUIT.
- ALL INSTALL TIMES/SCHEDULING/ACCESS MUST GO THRU CDOT EISENHOWER TUNNEL GROUP.

DREW PAPPAS 970-980-6574
DREW.PAPPAS@BONFIRE-EC.COM

PROJECT NAME: 1-70 BACKBONE FIBER--GLENWOOD TO GOLDEN, COLORADO (PHASE 4)
DRAWN BY: DREW PAPPAS  DATE: 2/18/2021
PHONE: 970-980-6574  ISSUE #: 1
E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM
COLORADO DEPARTMENT OF TRANSPORTATION
4200 Corporate Circle
Golden, CO 80401
Phone: 303-512-5801 Fax: 303-512-5878

DESIGN TYPICAL # 8  HQ - ITS BRANCH  SHEET #: 012  OF 083
(1) - Detail pertaining to the (2) existing CDOT pull boxes at each end of Hanging Lake Tunnel (east/west side)

(2) - Detail pertaining to the (8) existing CDOT pull boxes going through Hanging Lake Tunnel

NOTES:
- ALL CDOT TRACER WIRE MUST REMAIN IN PLACE OR BE RELOCATED TO OTHER SPARE DUCT.
- PLUG ALL DUCTS, MICROducts, AND CONDUIT.
(PER CDOT)

PROJECT NAME: I-70 BACKBONE FIBER — GLENWOOD TO GOLDEN, COLORADO (PHASE 4)

DRAWN BY: DREW PAPPAS
PHONE: 970-980-6574
E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM

COLORADO DEPARTMENT OF TRANSPORTATION

DESIGN TYPICAL # 9
BODY SPECIFICATIONS

Cover Weight (Split 1/2 Cover)  50 lbs  [23 kg]
Pit Weight  129 lbs  [59 kg]
Assembled Weight  229 lbs  [105 kg]
FIBER CABLE LABEL

- To be attached to each fiber optic cable located in all pull boxes and manholes (P&Ms)
- Electronic Marker System (EMS)
- Grounding ribbons
- Removable support
- 2 x 4" knockout (to remain in place for future removal)

24" X 35" PULL BOX (OR LARGER)

ITS PULL BOX TYPE

<table>
<thead>
<tr>
<th>Dimensions (Inches)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Column A (Feet)</th>
<th>Column B (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull Box (24&quot; x 38&quot; x 24&quot;)</td>
<td>24</td>
<td>36</td>
<td>24</td>
<td>4</td>
<td>60</td>
</tr>
</tbody>
</table>

PULL BOX NOTES:

1. Conduits depicted on this typical detail are representative only. Number of conduits installed and conduit size shall be as required.
2. Designation for the installation of electrical wiring and fiber optic cable in the backbone conduit system is described in the project specifications.
3. Conduit centerline shall be aligned within the pull box to facilitate fiber optic cable pulling.
4. Conduit plugs shall be installed in all conduits, both with and without wire or cable and shall be included in the cost of electrical conduit item.
5. Weatherproof tags shall be installed on all fiber cables and shall be included in the cost of electrical conduit item.
6. See design typical A and design typical B for more information.

7. All pull box types shall be paid for under the corresponding pull box item, and shall be sized as tabulated and shown in the plans.
8. Pull boxes shall have a concrete apron sloped away from pull box opening. The cost of the concrete apron shall be paid for as part of pull box item.
9. See table for the quantity of each fiber optic backbone and lateral cable to be coiled in all pull boxes.
10. Fiber optic cable coils within pull boxes shall be tied to each cable rack. Plastic wire ties shall not be allowed. Caution shall be taken to coil the fiber cables per manufacturer's recommendations.
11. Work to install pull box shall include but not be limited to sawing of pavement, removal of pavement, concrete, asphalt, all landscape restoration, and shall be paid for as part of pull box item. All material shall be contained by an approved BMP and not allowed to run off site.
12. Pull box types as depicted on this project detail shall not be installed in the asphalt or concrete shoulder of the roadway.
13. A communications electronic marker system (EMS) shall be embedded in to the cover as shown in details on the sheet.
14. All non-deliberate traffic pull boxes and covers must comply with all test provisions of latest edition of the AASHTO "Specification for Underground Enclosures Integrity" and must meet the T-22 application marking standard. The T-22 rating must be labeled on the inside and outside of the box and on the underside of the cover.
15. Cover must be secured to pull box using 3/8-7 lag thread hex head bolts.
16. A compliance letter from the manufacturer of the pull box shall be submitted with material submittals. The compliance letter shall indicate that the pull box manufacturer met or exceeded all test provisions of the latest edition of the AASHTO "Specification for Underground Enclosures Integrity" and all of the requirements levied in this sheet.
17. All pull box covers shall be furnished with 3/8" (3.56 x 1/2") deep test point areas, with 2 - 3/8-7 lag stainless steel hex head bolts, 2 - 3/8-7 stainless steel flat washers, directional labels, and 1 - ground label. The minimum number of test point areas and directional labels shall equal the number of conduit banks entering the pull box up to a maximum of 5 test points. Pull boxes with split legs shall have test points on one split leg section only.
18. Test point label shall be 1/8" diameter orange circle with black arrow graphics. One arrow graphic shall be installed for each test point used indicating the direction the conduit exits the pull box.
19. The deep recess of the polymer concrete pull box shall be cleaned with an alcohol-based cleaner prior to applying labels.

PROJECT NAME: 70 FIBER BACKBONE PROJECT – GLENWOOD SPRINGS TO GOLDEN, COLORADO (PHASE 1)

DRAWN BY: DREW PAPPAS
PHONE: 970-980-6574
E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM
SCALE: NTS

COOT HANDHOLE DETAIL

HO - ITS BRANCH
JKS SHEET # 016 OF 053

Colorado Department of Transportation
425 Corporate Circle
Sales: 303-312-5801
Fax: 303-312-5878
FILLETED EDGES FOR CABLE PROTECTION

REMOVEABLE POSTS AND STRAPS

MOUNTING BRACKET SUBJEC TO CHANGE

MOUNTING BRACKET CAPABLE OF FOUR DIFFERENT POSITIONS

INTERIOR POST HEIGHT 5.380

16.368 (INTERIOR DIM.)

17.500

PICMECHANICAL PROTECTION BOX

PROJECT NAME: 1-70 FIBER BACKBONE PROJECT – GLENWOOD SPRINGS TO GOLDEN, COLORADO (PHASE 4)

DRAWN BY: DREW PAPPAS
PHONE: 970-980-6574
E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM
SHEET #: 019

Colorado Department of Transportation
420 Corporate Circle
Golden, CO 80401
Phone: 303-527-5880
Fax: 303-527-5878
NOTES:
- Existing COOT Fiber duct bank in EJMT
- Existing pull box

FIBER OPTIC CABLE (SINGLE MODE) (216 STRANDS) (BACKBONE)

COOT fiber duct bank is located in the EB I-70 ventilation duct (above interstate inside tunnel).

Must coordinate with COOT to get access to ventilation duct for placement.

PROJECT NAME: I-70 FIBER BACKBONE PROJECT – GLENWOOD SPRINGS TO GOLDEN, COLORADO (PHASE 4)

DRAWN BY: DREW PAPPAS
DATE: 2/18/2021

PHONE: 970-980-6674
E-MAIL: DREW.PAPPAS@BONFIRE-EC.COM

SCALE: 1” = 100’

FIBER BACKBONE
HO – ITS BRANCH
JKS SHEET #: 051 OF 063

MILEPOST REFERENCE – 213

Know what you dig. Call before you dig.
Know what's below before you dig. Call R.