

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
&
PUBLIC FACILITIES

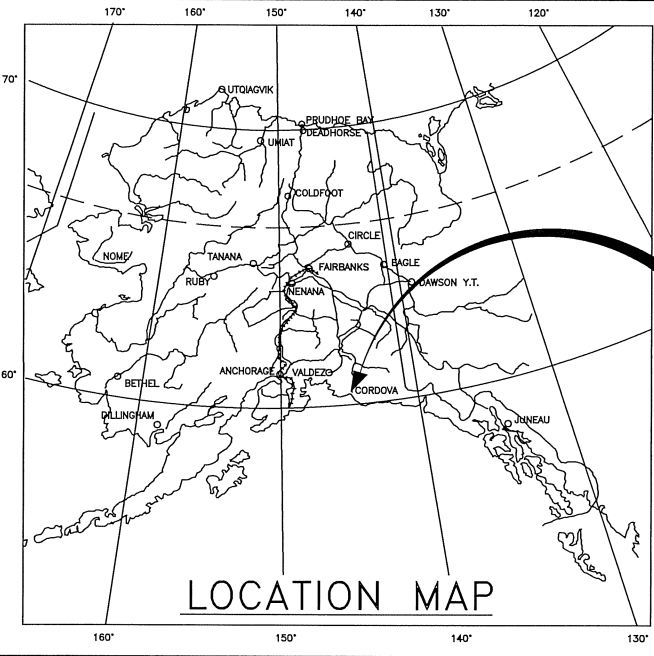
PROPOSED HIGHWAY PROJECT

0851071/NFWY00494

COPPER RIVER HIGHWAY MP 21.5 CULVERT REPLACEMENT
GRADING, SURFACING AND DRAINAGE

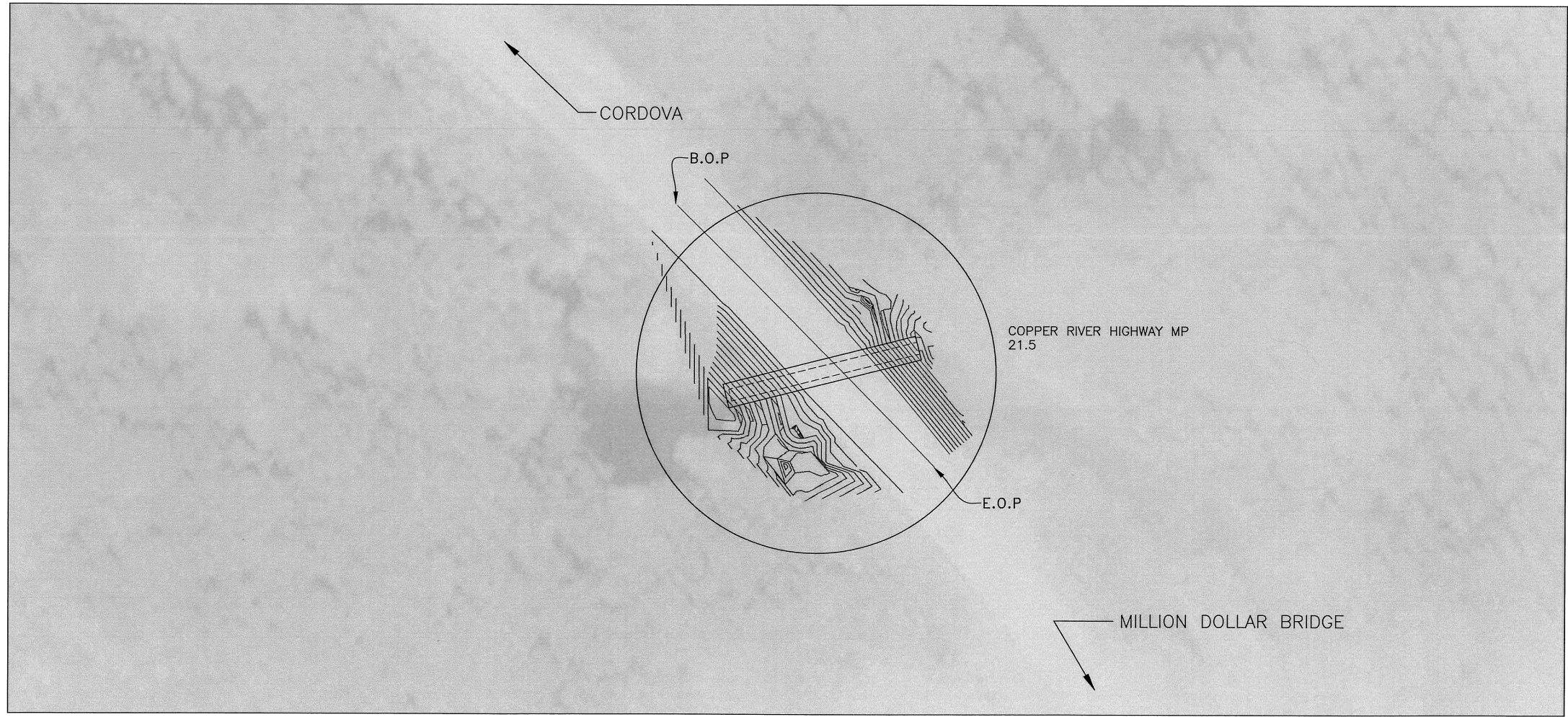
| NO. | DATE | REVISION | STATE | PROJECT DESIGNATION | YEAR | SHEET NO. | TOTAL SHEETS |
|-----|------|----------|-------------------|---------------------|-------------------------|-----------|--------------|
| | | | ALASKA | 0851071/NFWY00494 | 2021 | A1 | 13 |
| | | | CDS ROUTE: 210000 | | MILEPOINT: 21.5 TO 21.5 | | |

| INDEX OF SHEETS | |
|-----------------|----------------------------------------|
| SHEET NO. | DESCRIPTION |
| A1 | TITLE SHEET |
| A2 | LEGEND & SHEET LAYOUT INDEX |
| B1 | TYPICAL SECTIONS |
| C1 | ESTIMATE OF QUANTITIES & GENERAL NOTES |
| E1-E5 | CULVERT/DRAINAGE DETAILS & SUMMARY |
| Q1-Q2 | EROSION SEDIMENT CONTROL PLANS |
| T1-T2 | TRAFFIC CONTROL PLANS (and/or DEVICES) |



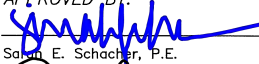
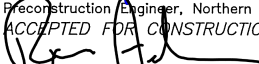
PROJECT
LOCATION

As Advertised
May 25, 2021
Northern Region



| PROJECT SUMMARY | |
|--------------------|--------|
| WIDTH OF SURFACING | 28 FT |
| LENGTH OF GRADING | 150 FT |
| LENGTH OF PAVING | N/A |
| LENGTH OF PROJECT | 300 FT |

David K. Fischer, P.E., PROJECT MANAGER
Erik Brunner, DESIGNER

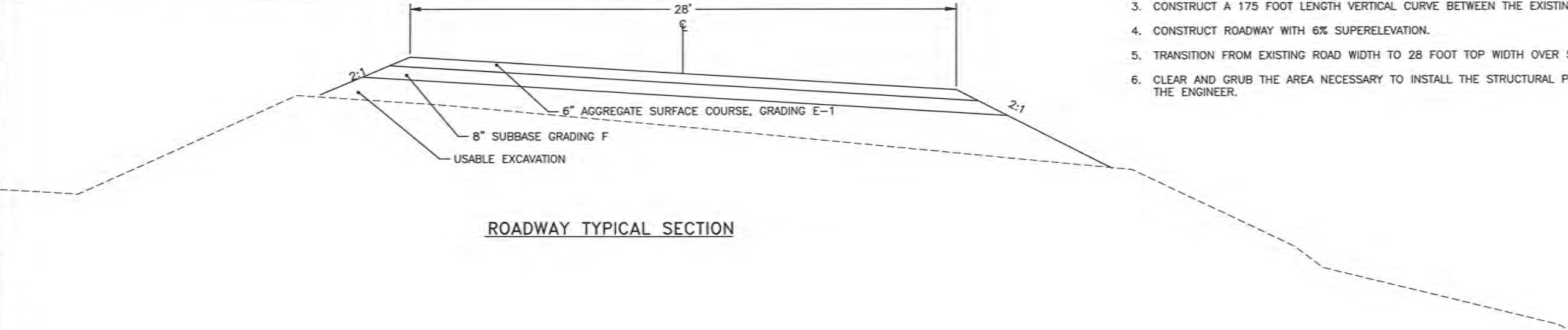
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
&
PUBLIC FACILITIES
APPROVED BY:  DATE 3/17/2021
Ryan F. Anderson, P.E.
Regional Director, Northern Region
ACCEPTED FOR CONSTRUCTION:  DATE 3/17/21
Erik Brunner, P.E.
Regional Director, Northern Region

PLANS DEVELOPED BY: STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES, NORTHERN REGION, 2301 PEGER ROAD, FAIRBANKS, AK 99709 (907)451-2200
H:\Projects\CRH\CRH MP 21.5 Culvert\4 C3D\1 Plots\Typical Section-1 Typical Section Thu, Jan/28/21 02:46pm

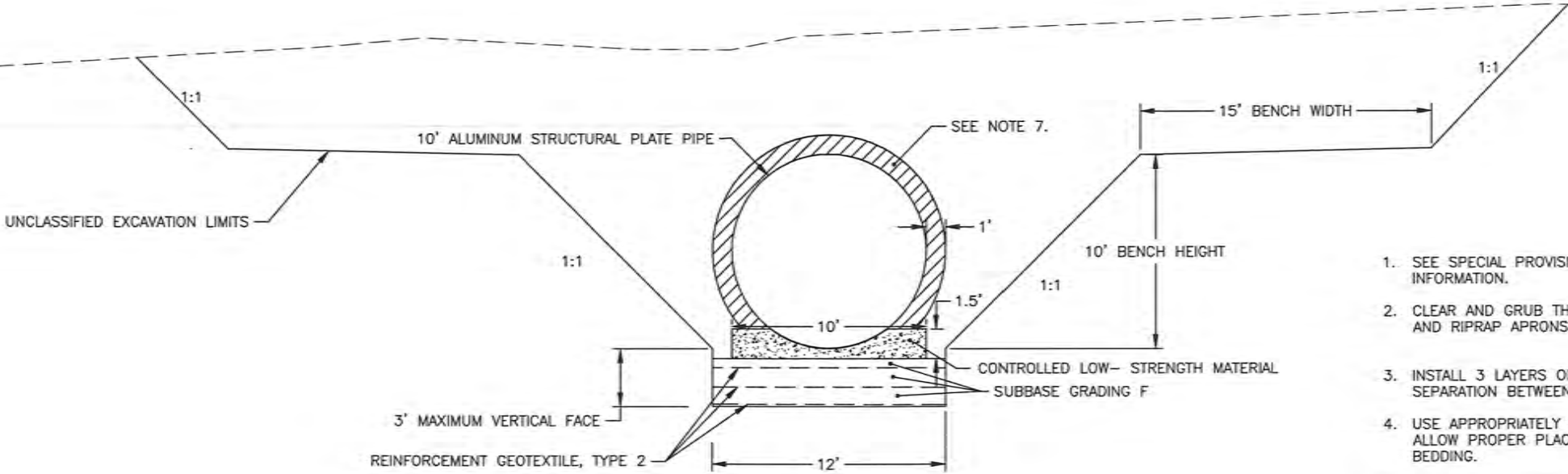
| COPPER RIVER HIGHWAY | | | | |
|----------------------|------------|-------------|-----------|------------------|
| STATION | NORTHING | EASTING | ELEVATION | COMMENT |
| 100+00 | 79362.8547 | 305445.2784 | | P.T. |
| 102+25 | 79215.6426 | 305615.1698 | 25.02 | ELEVATION MATCH |
| 103+00 | 79161.2409 | 305666.7871 | 25 | V.P.I, LVC 175' |
| 103+11.74 | 79176.4935 | 305695.1856 | | P.I RADIUS 1356' |
| 103+75 | 79104.3847 | 305715.6875 | 24.61 | ELEVATION MATCH |
| 106+15.13 | 78907.4499 | 305852.6647 | | P.T. |

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1. MAINTAIN EXISTING CENTERLINE AND ROAD CURVATURE (NOMINAL CURVE RADIUS 1536 FT.)
2. TRANSITION TO EXISTING ROADWAY ELEVATION AND CROWN OVER 50 FEET BEYOND EXCAVATION LIMITS.
3. CONSTRUCT A 175 FOOT LENGTH VERTICAL CURVE BETWEEN THE EXISTING ROADWAY PROFILE MATCH POINTS.
4. CONSTRUCT ROADWAY WITH 6% SUPERELEVATION.
5. TRANSITION FROM EXISTING ROAD WIDTH TO 28 FOOT TOP WIDTH OVER 50 FEET.
6. CLEAR AND GRUB THE AREA NECESSARY TO INSTALL THE STRUCTURAL PLATE PIPE AND RIPRAP APRONS AS DIRECTED BY THE ENGINEER.



ROADWAY TYPICAL SECTION



PIPE EXCAVATION TYPICAL SECTION

1. SEE SPECIAL PROVISION 602-5.01 BASIS OF PAYMENT FOR EXCAVATION PAYMENT INFORMATION.
2. CLEAR AND GRUB THE AREA NECESSARY TO INSTALL THE STRUCTURAL PLATE PIPE AND RIPRAP APRONS AS DIRECTED BY THE ENGINEER.
3. INSTALL 3 LAYERS OF REINFORCEMENT GEOTEXTILE, TYPE 2 WITH ONE FOOT SEPARATION BETWEEN LAYERS
4. USE APPROPRIATELY PLACED SAND BAGS AS SUPPORT UNDER THE PIPE TO ALLOW PROPER PLACEMENT AND FLOW OF CONTROLLED-LOW STRENGTH MATERIAL BEDDING.
5. PLACE CONTROLLED LOW-STRENGTH MATERIAL (CLSM) TO 1 FOOT ABOVE PIPE INVERT.
6. BEDDING THICKNESS OF CLSM TO BE SIX INCHES BELOW PIPE.
7. EMBEDMENT MATERIAL BEYOND LIMITS OF CLSM PLACEMENT SHALL BE SUBBASE GRADING "F" WITH A MINIMUM THICKNESS OF ONE FOOT.
8. TRENCH BACKFILL MATERIAL BEYOND THE LIMITS OF THE CLSM AND SUBBASE GRADING "F" BEDDING AND EMBEDMENT SHALL BE USABLE EXCAVATION.

TYPICAL SECTIONS



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H:\Projects\crh\crh_mp_21.5 culvert\6 design\4 c3d\1 plots\C1new-C1 Fri, May/21/21 01:44pm

| NO. | DATE | REVISION | STATE | PROJECT DESIGNATION | YEAR | SHEET NO. | TOTAL SHEETS |
|-----|------|----------|--------|---------------------|------|-----------|--------------|
| | | | ALASKA | 0851071/NFHWY00494 | 2021 | C1 | 13 |
| | | | | | | | |

| ESTIMATE OF QUANITITES | | | |
|------------------------|--------------------------------------------------------------|----------------|--------------|
| ITEM NUMBER | DESCRIPTION | PAY UNIT | QUANTITY |
| 201.0009.0000 | CLEARING AND GRUBBING | LUMP SUM | ALL REQUIRED |
| 202.0001.0000 | REMOVAL OF STRUCTURES AND OBSTRUCTIONS | LUMP SUM | ALL REQUIRED |
| 203.0019.0000 | UNCLASSIFIED EXCAVATION | LUMP SUM | ALL REQUIRED |
| 205.0005.0000 | CONTROLLED LOW-STRENGTH MATERIAL | CUBIC YARD | 35 |
| 301.0004.00E1 | AGGREGATE SURFACE COURSE,GRADING E-1 | CUBIC YARD | 90 |
| 304.0002.000F | SUBBASE, GRADING F | CUBIC YARD | 295 |
| 602.2012.1000 | ALUMINUM STRUCTURAL PLATE PIPE 10'-0" DIAMETER, 0.125" THICK | LINEAR FOOT | 81 |
| 602.2020.0000 | SPECIAL DEWATERING | CONTINGENT SUM | ALL REQUIRED |
| 611.0001.0001 | RIPRAP, CLASS I | CUBIC YARD | 240 |
| 613.0002.0000 | CULVERT MARKER POST | EACH | 2 |
| 628.2000.0000 | FISH PASSAGE SUBSTRATE | LUMP SUM | ALL REQUIRED |
| 630.0003.0002 | GEOTEXTILE, REINFORCEMENT-TYPE 2 | SQUARE YARD | 340 |
| 631.0002.0001 | GEOTEXTILE, EROSION CONTROL, CLASS 1 | SQUARE YARD | 450 |
| 640.0001.0000 | MOBILIZATION AND DEMOBILIZATION | LUMP SUM | ALL REQUIRED |
| 640.0004.0000 | WORKER MEALS AND LODGING, OR PER DIEM | LUMP SUM | ALL REQUIRED |
| 641.2000.0000 | POLLUTION CONTROL | LUMP SUM | ALL REQUIRED |
| 642.0001.0000 | CONSTRUCTION SURVEYING | LUMP SUM | ALL REQUIRED |
| 643.0002.0000 | TRAFFIC MAINTENANCE | LUMP SUM | ALL REQUIRED |
| 643.2016.0000 | ROAD CLOSURE | LUMP SUM | ALL REQUIRED |
| 644.0001.0000 | FIELD OFFICE | LUMP SUM | ALL REQUIRED |
| 644.0006.0000 | VEHICLE | LUMP SUM | ALL REQUIRED |
| | | | |
| | | | |
| | | | |
| | | | |

GENERAL NOTES:

1. PRIOR TO ANY GROUND DISTURBING ACTIVITIES, THE CONTRACTOR SHALL FIELD LOCATE ALL ACTIVE UTILITIES WITHIN THE PROJECT EXTENTS AND THEN PROTECT THEM FROM DAMAGE FOR THE DURATION OF THE WORK.
2. RESTORE ALL ROADWAY GEOMETRY INCLUDING HORIZONTAL, VERTICAL, SUPERELEVATION, ROADSIDE SLOPES AND FEATURES AFFECTED BY THE WORK EXCEPT AS SPECIFICALLY NOTED ELSEWHERE IN THE PLANS.
3. ITEM 202.0001.0000 INCLUDES BUT IS NOT LIMITED TO, THE REMOVAL OF THE EXISTING STEEL CULVERT AND ANY BURIED TRESTLE REMNANTS ENCOUNTERED IN THE EXCAVATION LIMITS.

4. ALL MATERIALS SHALL BE CONTRACTOR FURNISHED.

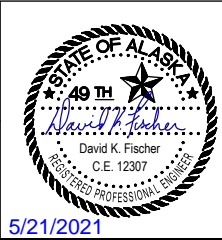
PIPE INSTALLATION NOTES:

5. IN WATER WORK TO BE COMPLETED IN COMPLIANCE WITH FISH HABITAT PERMIT FH21-II-0007.
6. PROVIDE A WATER HANDLING WORK PLAN IN ACCORDANCE WITH SECTION 602. THIS PLAN IS SUBSIDIARY TO 602.2012.1000
7. IT IS ANTICIPATED THAT THE BOTTOM 4 FEET OF TRENCH EXCAVATION WILL BE UNUSABLE FOR RECONSTRUCTING THE ROAD.
8. LUMP SUM ESTIMATING FACTOR FOR THE UNCLASSIFIED EXCAVATION IS BASED ON CONSTRUCTING THE PIPE TRENCH TO THE DIMENSIONS SHOWN ON SHEET E2. CONTRACTOR EQUIPMENT BASED TRENCH SIZE VARIANCE IS ACCEPTABLE PROVIDED ALL PLAN MINIMUM PIPE BEDDING AND EMBEDMENT DIMENSIONS ARE MET.

| LUMP SUM ESTIMATING FACTORS | | |
|-----------------------------|----------------------------------------|-----------------------------------------------------------------|
| ITEM NUMBER | DESCRIPTION | ALT UNIT |
| 201.0009.0000 | CLEARING AND GRUBBING | .25 ACRE |
| 202.0001.0000 | REMOVAL OF STRUCTURES AND OBSTRUCTIONS | EXISTING 5 FOOT DIAMETER PIPE, TRESTLE REMNANTS |
| 203.0019.0000 | UNCLASSIFIED EXCAVATION | 1735 CY PIPE TRENCH, 80 CY STREAM REALIGNMENT |
| 304.0002.000 | SUBBASE, GRADING F | 115 CY ROAD SUBBASE, 180 CY BEDDING AND EMBEDMENT |
| 628.2000.0000 | FISH PASSAGE SUBSTRATE | 155 CY CLASS I RIPRAP 35 CY AGGREGATE SURFACE COURSE GRADING E1 |
| | | |

| PROJECT CONTROL POINTS | | | | |
|------------------------|------------|-------------|-----------|-------------------------|
| PT NUMBER | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 1 | 78939.2130 | 305817.6280 | 22.16 | REBAR CAP SET 1 14471-S |
| 2 | 79226.0060 | 305580.3040 | 23.5 | REBAR CAP SET 2 14471-S |
| 3 | 76481.4350 | 306811.5090 | 31.49 | USCG-MON F73 RESET 1981 |

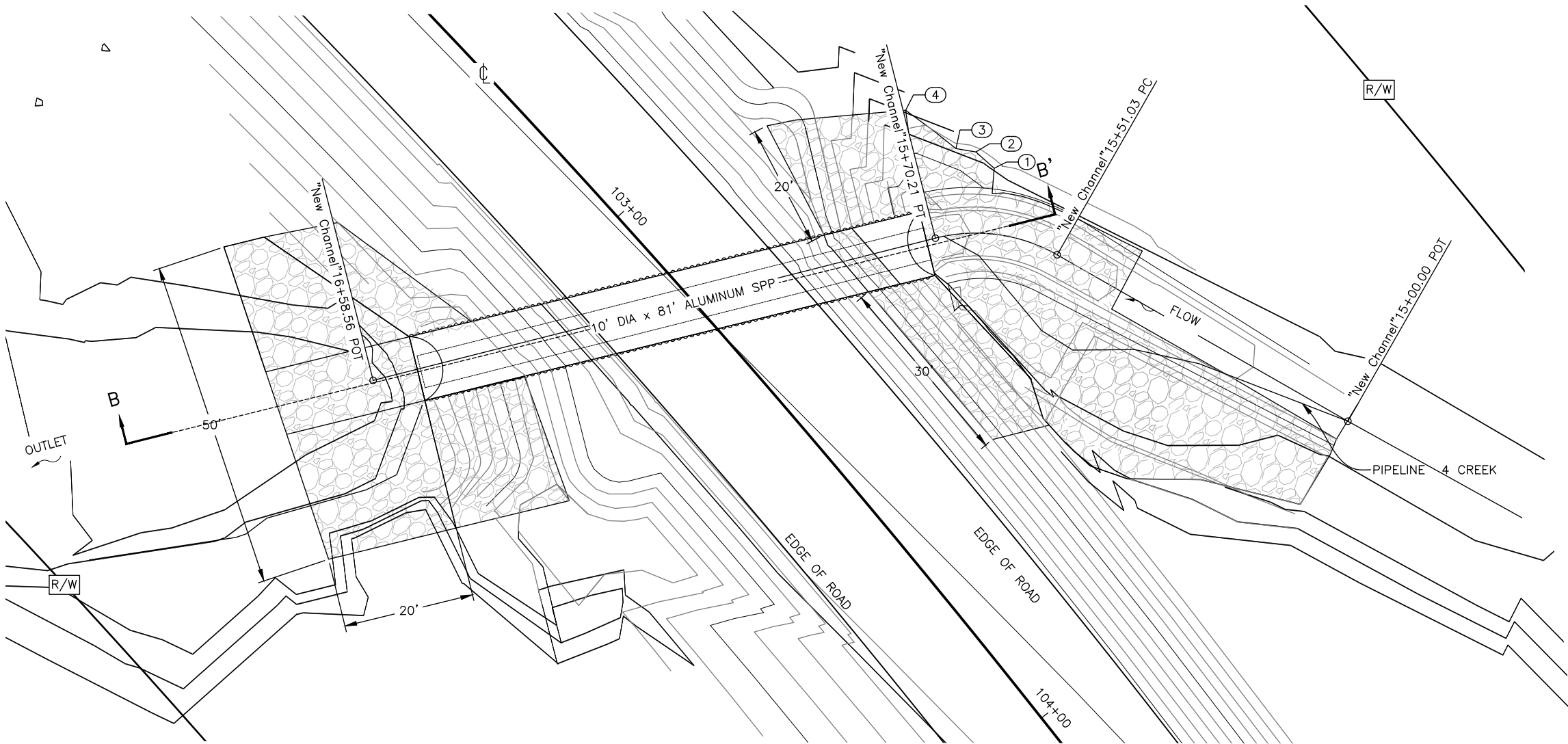
ESTIMATE OF QUANTITIES



5/21/2021

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H:\Projects\CRH\CRH_MP_21.5_Culvert\6_Design\4_C3D\1_Plots\00148_E_Culvert & Riprap Details-E1 Tue, Apr/20/21 10:13am

| NO. | DATE | REVISION | STATE | PROJECT DESIGNATION | YEAR | SHEET NO. | TOTAL SHEETS |
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| | | | ALASKA | 0851071/NFHWY00494 | 2021 | E1 | 13 |
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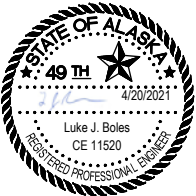
CULVERT PLAN VIEW

| HYDROLOGIC & HYDRAULIC SUMMARY | | | | | |
|---------------------------------------------------------------------------|-------------|----------|----------|-----------|------------|
| COPPER RIVER HWY MILE 21.5 - PIPELINE 4 CREEK | | | | | |
| BASIN AREA (SQ. MI) | QFISH (CFS) | Q2 (CFS) | Q5 (CFS) | Q50 (CFS) | Q100 (CFS) |
| 0.8 | 41.6 | 104 | 165 | 320 | 372 |
| HEADWATER ELEVATION @Q50 IS 17.5 FT, HEADWATER ELEVATION @Q100 IS 18.3 FT | | | | | |
| HW/D = 1 @ 339 CFS, ROAD OVERTOPS AT APPROXIMATELY 635 CFS | | | | | |

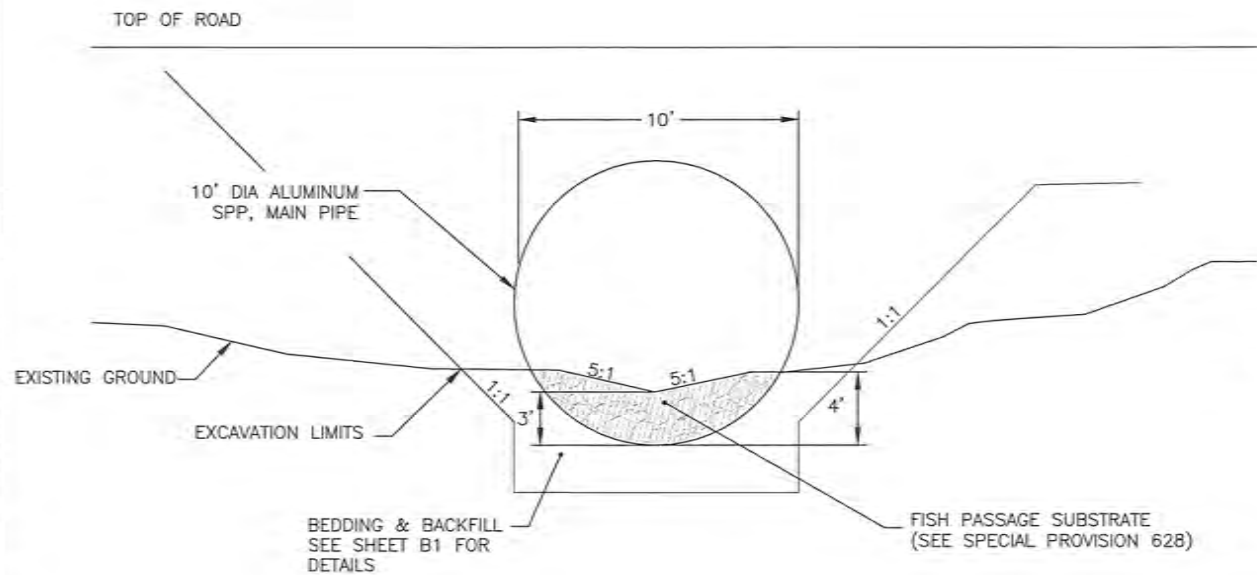
| CULVERT SUMMARY | | | | | | | | | | |
|---------------------------------------------------|-----------|--------------|--------------|-----------|---------------|---------------|---------------------------------------------------|-------------------------------|----------|-----------|
| 602.2012.1000 A.S.P.P 10' DIAM,0.125" THICK | INLET STA | INLET OFFSET | INLET INVERT | OULET STA | OUTLET OFFSET | OUTLET INVERT | 613.0002.0000 CULVERT MARKER POST (EACH) | *AS-BUILT CENTERLINE LOCATION | | |
| | | | | | | | | STATION | LATITUDE | LONGITUDE |
| 81' | 103+33.95 | -32.6 | 7.8 | 102+96.46 | 39.53 | 6.7 | 2 | | | |

REFER TO NOTES ON SHEET E2. SEE SHEET E3 FOR STREAM AND RIPRAP CONTROL POINTS.

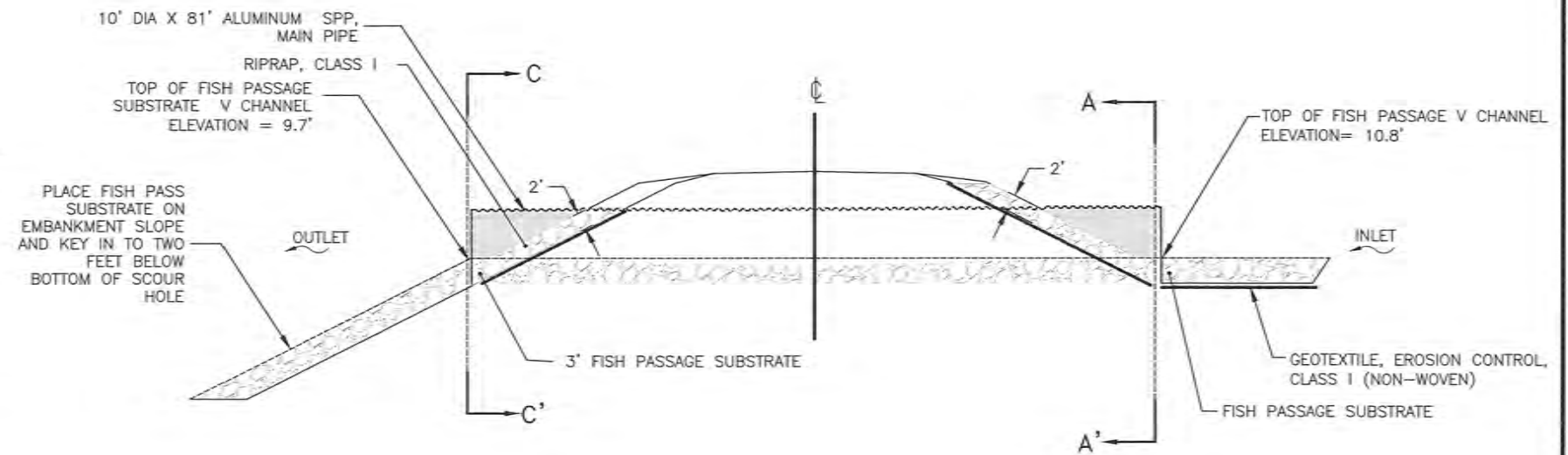
PIPELINE 4 CREEK PLAN



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| | | | ALASKA | 0851071/NFHWY00494 | 2021 | E2 | 13 |



SECTION A-A'



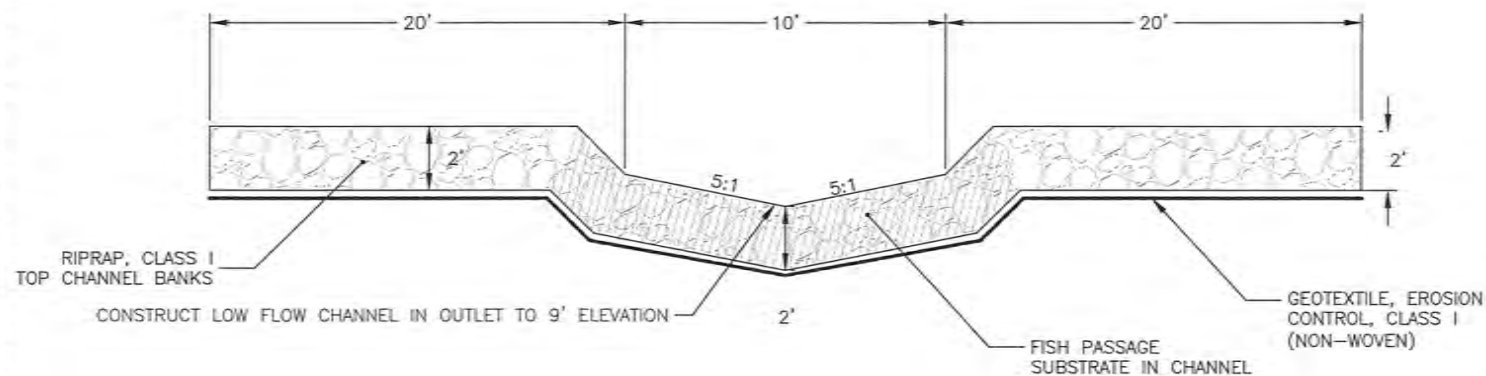
SECTION B-B'

NOTES:

1. THIS CULVERT WAS DESIGNED TO PROVIDE FISH PASSAGE.
2. CONSTRUCT FISH PASSAGE SUBSTRATE WITHIN THE CULVERT. SEE SPECIAL PROVISION 628. CREATE A V-CHANNEL WITH 5:1 SLOPES. PLACE FISH SUBSTRATE FROM THE BEGINNING OF THE CHANNEL REALIGNMENT TO THE END OF THE CULVERT OUTLET TO THE DIMENSIONS SHOWN IN THE PLANS.
3. INSTALL A 10' ALUMINUM SPP DEPRESSED 4 FEET INTO THE CHANNEL BOTTOM.
4. TIE INLET AND OUTLET APRON INTO EXISTING STREAM CHANNEL APPROXIMATELY MATCHING STREAMBED AND BANK ELEVATIONS. AT OUTLET PLACE RIPRAP ON EMBANKMENT SLOPE TO SCOUR POOL BOTTOM ELEVATION.
5. ANY RIPRAP FORESLOPE ARMORING PLACED BEYOND THE LIMITS OF THE PIPE EXCAVATION MAY BE PLACED ON EXISTING FORESLOPES WITHOUT INSETTING.

FISH PASSAGE CULVERT NOTES:

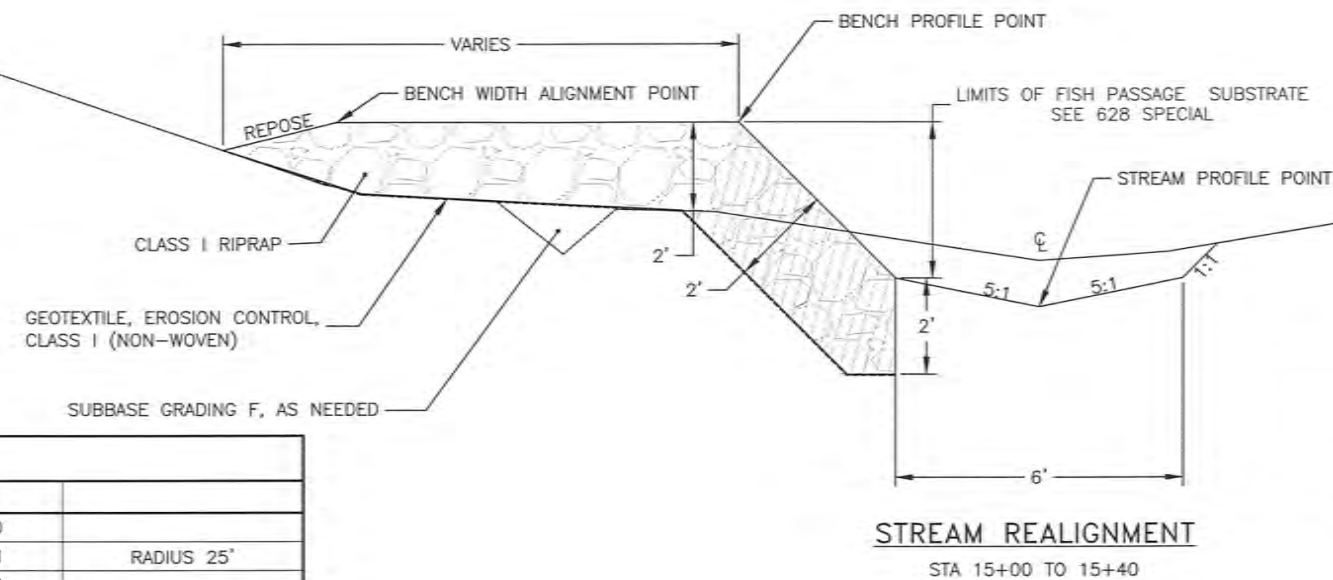
1. FISH PASSAGE CULVERTS SHALL BE INSTALLED ON DRY GROUND.
2. FISH PASSAGE SUBSTRATE CONSISTS OF RIPRAP WITH VOIDS FILLED WITH AGGREGATE SURFACE COURSE, E-1, AS SPECIFIED IN SPECIAL PROVISION 628.
3. PLACE FISH PASSAGE SUBSTRATE IN RIPRAP APRON INLET & OUTLET POOL/CHANNELS AS SPECIFIED ON THE FISH PASSAGE CULVERT DETAIL SHEETS AND PER SPECIAL PROVISION 628. SHAPE INLET & OUTLET CHANNELS TO MATCH EXISTING CREEK CHANNEL CROSS SECTION, OR AS SPECIFIED ON THE PLANS.
4. EXTEND FORESLOPE RIPRAP 3.0 FEET ABOVE THE CULVERT, OR TO THE SHOULDER ELEVATION, WHICHEVER IS LESS ON THE INLET SIDE, AND TO THE TOP OF THE CULVERT ON THE OUTLET SIDE, .
5. CONDUCT AN AS-BUILT SURVEY TO ENSURE THAT FISH PASSAGE CULVERTS WERE CONSTRUCTED PER DESIGN. INCLUDE ELEVATIONS OF CULVERT INVERTS, TOP OF FISH PASSAGE SUBSTRATE ELEVATIONS AND RIPRAP APRON ELEVATIONS. COLLECT APPROPRIATE DATA AT CORRESPONDING PHASE OF INSTALLATION. IE: SURVEY TOP OF BEDDING PRIOR TO PLACING CULVERT.
6. ADDITIONAL REQUIREMENTS FOR FISH PASSAGE CULVERTS MAY BE CONTAINED IN THE ADF&G HABITAT PERMITS.



SECTION C-C'
PLACE OUTLET APRON ONTO
EXISTING SCOUR POOL AND STREAM BANKS

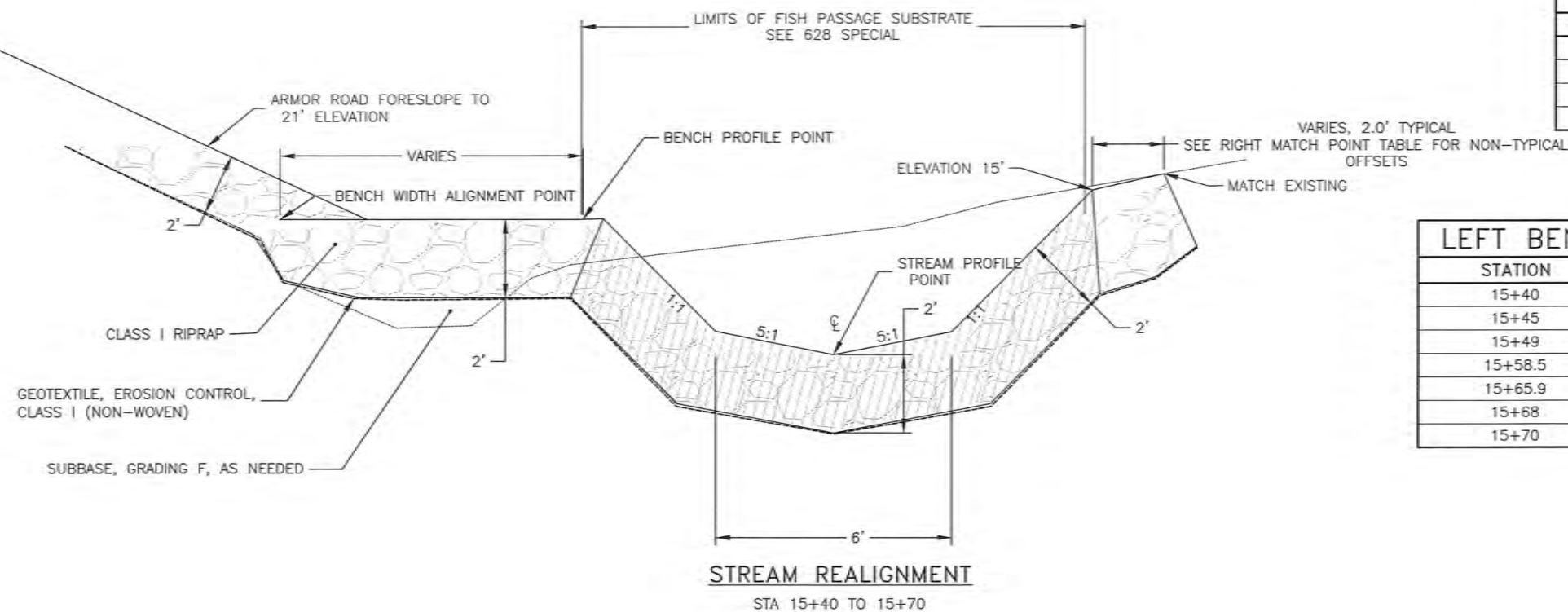
PLANS DEVELOPED BY: STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES, NORTHERN REGION, 2301 PEGER ROAD, FAIRBANKS, AK 99709 (907)451-2200
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| NEW CHANNEL ALIGNMENT | | | | |
|-----------------------|-----------|------------|-------------|------------|
| STATION | ELEVATION | NORTHING | EASTING | |
| 15+00 | 13.69 | 79129.2850 | 305776.9350 | |
| 15+51.03 PC | | 79154.6281 | 305732.6471 | RADIUS 25' |
| MID CURVE | | 79157.6987 | 305723.6206 | |
| 15+70.21 PT | 10.8 | 79157.1666 | 305714.1011 | |

| LEFT BENCH WIDTH AND ELEVATION | | |
|--------------------------------|--------|-----------|
| STATION | OFFSET | ELEVATION |
| 15+00 | -14.6 | 17 |
| 15+15 | -18.9 | 17 |
| 15+24.75 | -24.3 | 17 |
| 15+30 | -25.4 | 17 |
| 15+35.6 | -24.3 | 16 |



| RIGHT MATCH POINT | | |
|-------------------|---------|--------|
| PT # | STATION | OFFSET |
| 1 | 15+62 | 10 |
| 2 | 15+64 | 12.5 |
| 3 | 15+66 | 13 |
| 4 | 15+70 | 20 |

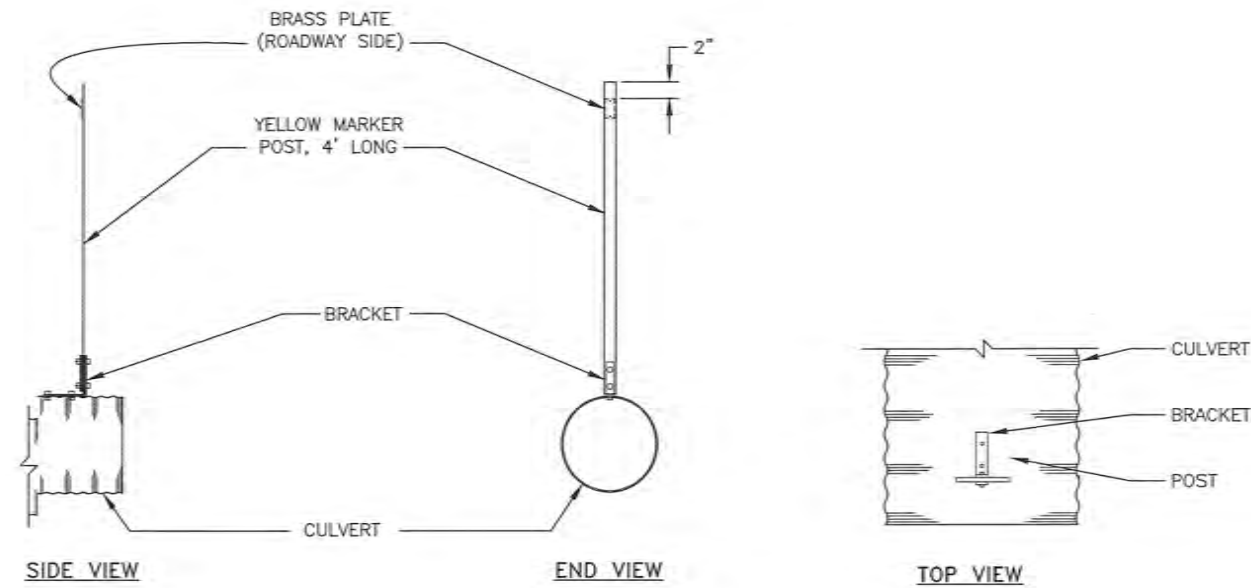
| LEFT BENCH WIDTH AND ELEVATION | | |
|--------------------------------|--------|-----------|
| STATION | OFFSET | ELEVATION |
| 15+40 | -22.7 | 15 |
| 15+45 | -18.5 | 15 |
| 15+49 | -16.7 | 15 |
| 15+58.5 | -14.8 | 15 |
| 15+65.9 | -11.1 | 15 |
| 15+68 | -10.9 | 15 |
| 15+70 | -11.5 | 15 |

CHANNEL REALIGNMENT

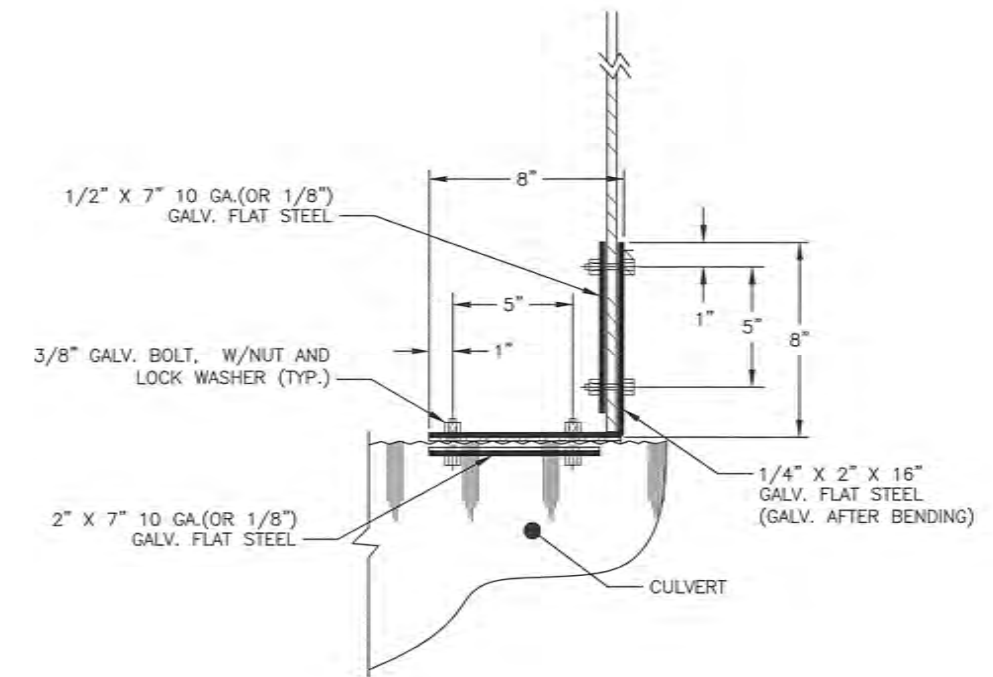


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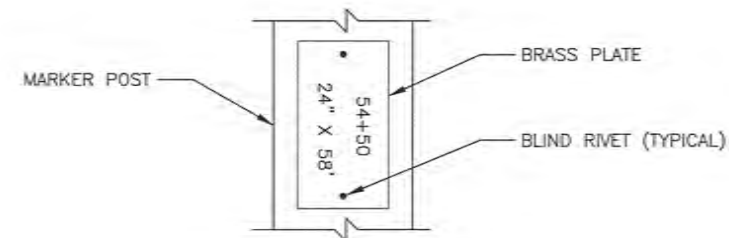
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| | | | ALASKA | 0851071/NFHWY00148 | 2021 | E4 | 13 |



CULVERT MARKER POST DETAIL

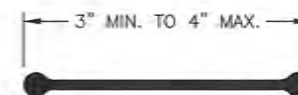


BRACKET DETAIL



STAMP STATION AND PIPE SIZE, USING 3/8" HIGH MINIMUM LETTERS INTO A 2"X4"X 0.064" THICK BRASS PLATE. FASTEN PLATE TO THE SIDE FACING THE ROADWAY WITH TWO 1/8" BRASS BLIND RIVETS.

BRASS PLATE DETAIL



POST DETAIL
CROSS-SECTION VIEW

CULVERT MARKER POSTS NOTES:

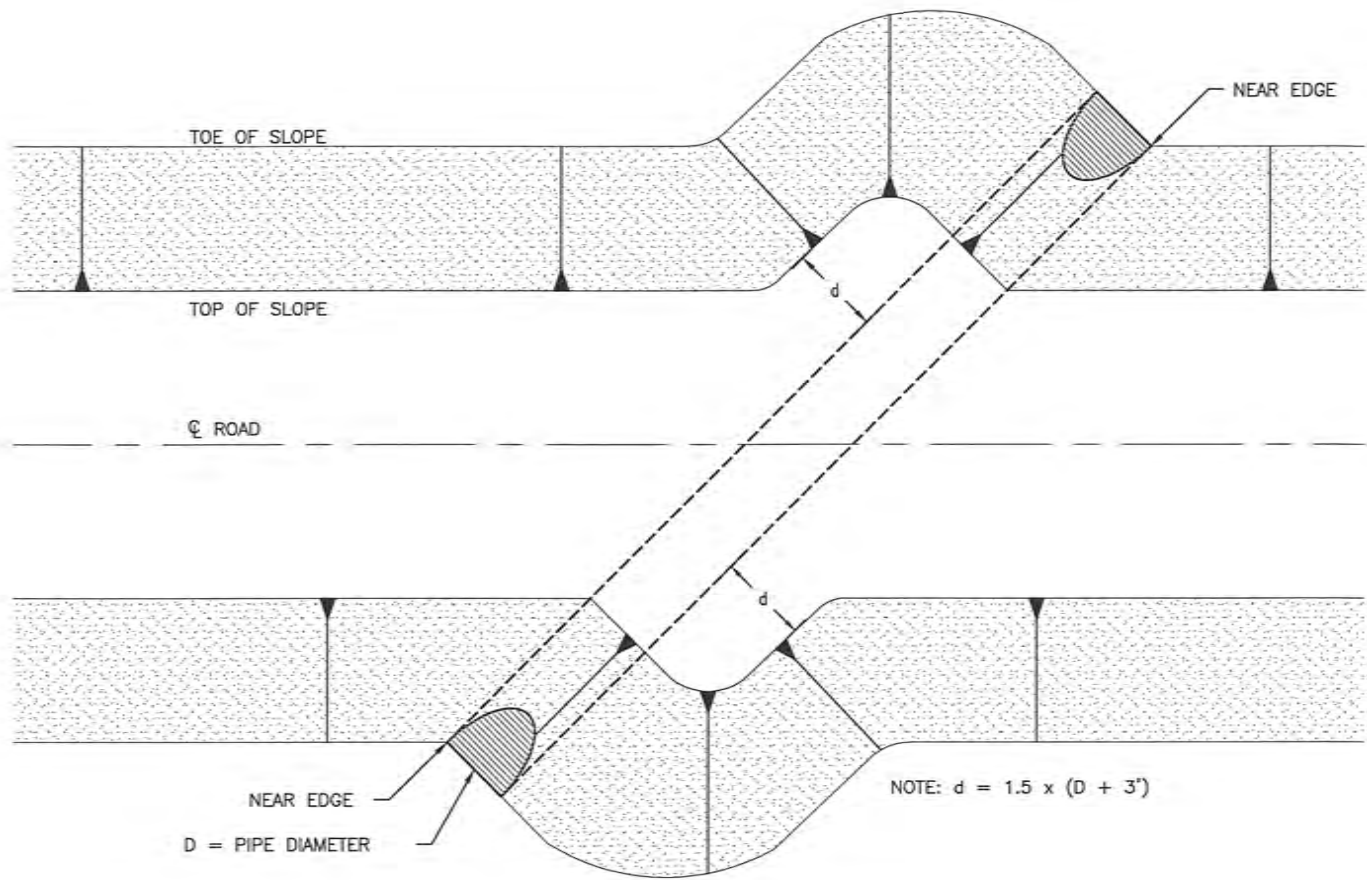
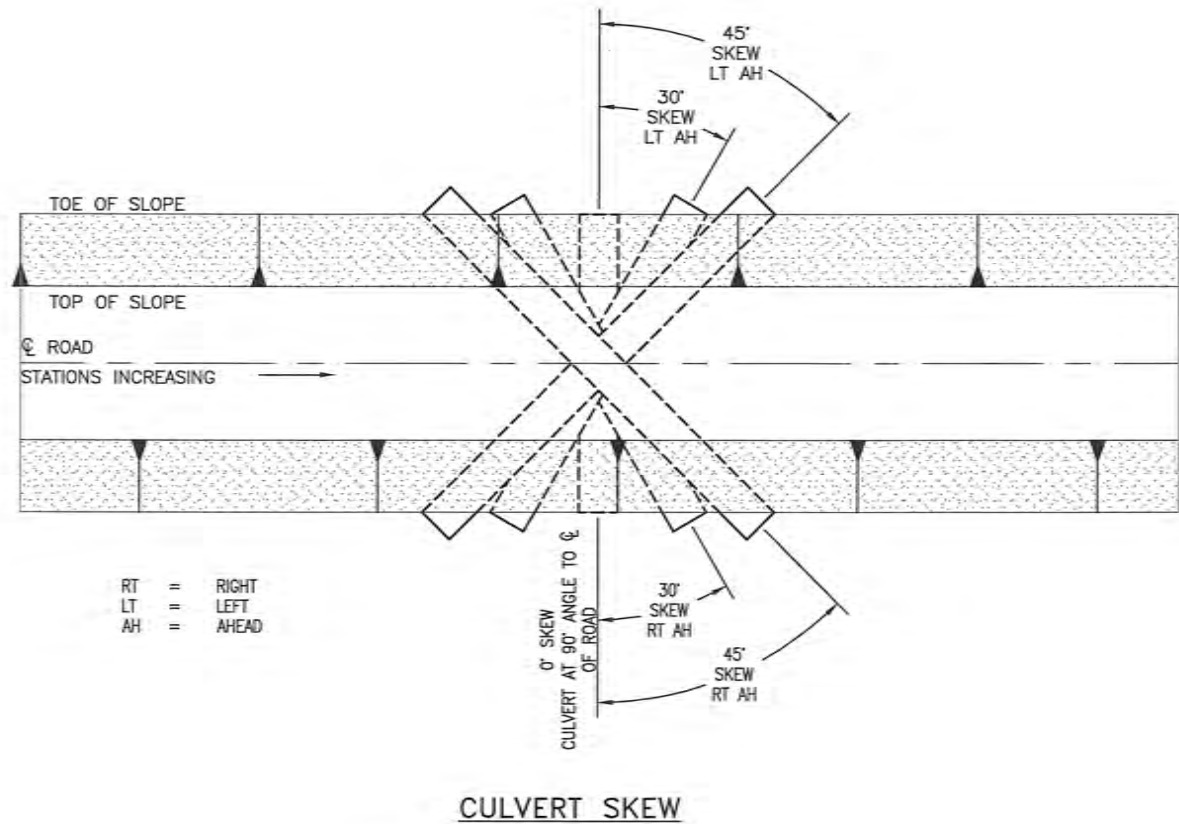
1. DRILL ALL BOLT HOLES. COAT HOLES WITH ZINC RICH PAINT. FLAME CUTTING SHALL NOT BE PERMITTED.
2. GASKET MATERIAL SHALL BE PLACED BETWEEN DISSIMILAR METALS. GASKET MATERIAL SHALL BE APPROVED PRIOR TO INSTALLATION.

CULVERT MARKER POST DETAILS

CULVERT MARKER



| NO. | DATE | REVISION | STATE | PROJECT DESIGNATION | YEAR | SHEET NO. | TOTAL SHEETS |
|-----|------|----------|--------|---------------------|------|-----------|--------------|
| | | | ALASKA | 0851071/NFHWY00494 | 2021 | E5 | 12 |



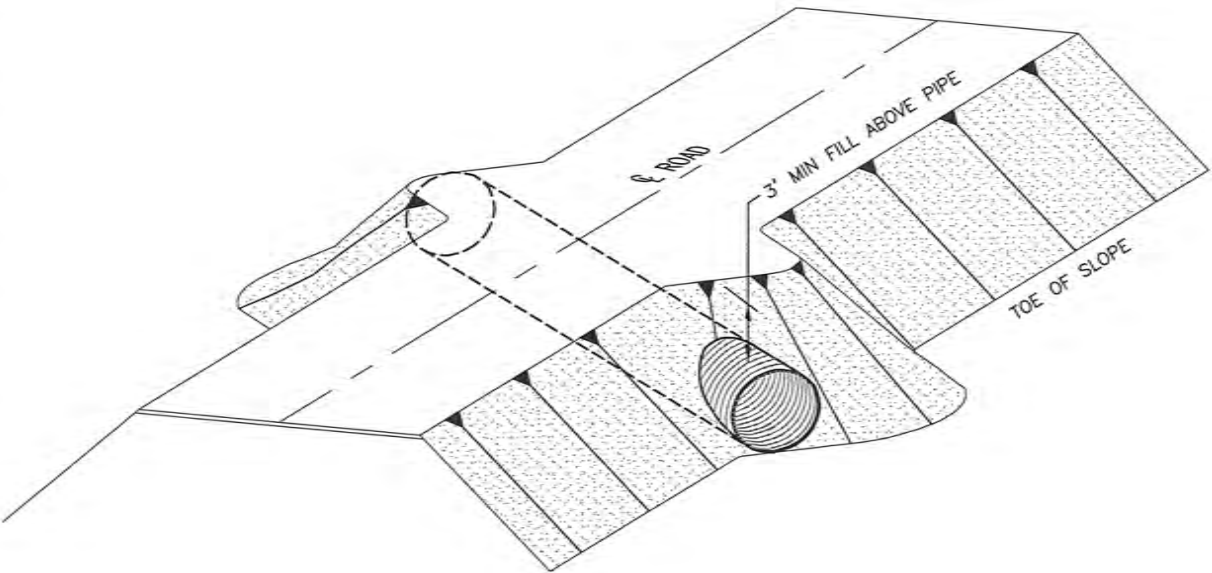
NOTE: $d = 1.5 \times (D + 3')$

D = PIPE DIAMETER

EMBANKMENT WIDENING FOR SKEWED CULVERTS PLAN

NOTES:

1. CONSTRUCT CULVERT EMBANKMENT WIDENING
2. WHEN INSTALLING NEW, OR EXTENDING EXISTING, SKEWED CULVERTS, ENSURE THE FINAL LENGTH IS DETERMINED OFF THE NEAR EDGE, NOT THE CENTERLINE OF THE CULVERT.
3. TO PREVENT UNBALANCED SOIL LOADS ON THE SKEWED CULVERT, THE EMBANKMENT SHALL BE SHAPED OR WARPED, TO BALANCE LOADS AND ENSURE SIDE SUPPORT.
4. CONSTRUCT LIFTS ON EACH SIDE OF THE CULVERT CONCURRENTLY TO MINIMIZE UNBALANCED LOADING DURING INSTALLATION.
5. ALL WORK AND RESOURCES REQUIRED TO COMPLETE EMBANKMENT WIDENING FOR SKEWED CULVERTS ARE SUBSIDIARY TO 602 SERIES PAY ITEMS.



EMBANKMENT WIDENING FOR SKEWED CULVERTS OBLIQUE

EMBANKMENT WIDENING



PLANS DEVELOPED BY: STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES, NORTHERN REGION, 2301 PEGER ROAD, FAIRBANKS, AK 99709 (907)451-2200
H:\Projects\CRH\CRH_MP 21.5 Culvert\6 Design\4 c3D\1 Plots\ESCP-ESCP 1 of 2 Wed, Apr/14/21 08:31am

| NO. | DATE | REVISION | STATE | PROJECT DESIGNATION | YEAR | SHEET NO. | TOTAL SHEETS |
|-----|------|----------|--------|---------------------|------|-----------|--------------|
| | | | ALASKA | 0851071/NFHWY00494 | 2021 | Q1 | 12 |
| | | | | | | | |

ESCP NOTES:

- PROJECT FUNCTION: CULVERT REPLACEMENT
- THIS PROJECT WILL NOT BE REQUIRED TO DEVELOP A STORM WATER POLLUTION PREVENTION PLAN OR FILE AN NOI WITH ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION. EVEN IF THIS PROJECT DOES NOT NEED PERMIT COVERAGE , EROSION AND SEDIMENT CONTROLS WILL BE NEEDED AND WATER QUALITY WILL BE PROTECTED. INITIATE EROSION AND SEDIMENT CONTROLS PRIOR TO ANY EARTH DISTURBING ACTIVITIES.
- INSTALL EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES PRIOR TO THE START OF CONSTRUCTION, AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ONSITE.
- BEST MANAGEMENT PRACTICES (BMPS) IMPLEMENTED ON THE PROJECT WILL UTILIZE THE SPECIFICATIONS PROVIDED IN THE ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION STORM WATER GUIDE OR THE DOT& PF BMP GUIDE WHENEVER POSSIBLE.
- TEMPORARY BEST MANAGEMENT PRACTICES THAT ARE REQUIRED, ARE SUBSIDIARY TO 641.2000.0000 POLLUTION CONTROL
- MAINTAIN BEST MANAGEMENT PRACTICES ON A REGULAR BASIS INCLUDING, BUT NOT LIMITED TO REMOVAL AND DISPOSAL OF SEDIMENT AND REPLACING DAMAGED BEST MANAGEMENT PRACTICES OR AS DIRECTED BY THE ENGINEER.

CULVERTS:

- PROVIDE TEMPORARY INLET AND OUTLET PROTECTION FOR CULVERTS IN THE PROJECT AREA PRIOR TO MAKING OPERATIONAL OR EARTH DISTURBING ACTIVITIES.
- PERMANENT CULVERT INLET AND OUTLET PROTECTION WILL BE RIPRAP

- SEED ALL DISTURBED AREAS CAPABLE OF SUPPORTING VEGETATION AS DIRECTED BY THE ENGINEER. THIS IS SUBSIDIARY

PERIMETER CONTROL NOTES*

- INSTALL PERIMETER CONTROL BEST MANAGMENT PRACTICES WHEN WITH 25 FEET OF SURFACE WATER AND ALONG WETLANDS WHERE A 25 FOOT VEGETATIVE BUFFER IS NOT RETAINED.
- PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY EARTH DISTURBING ACTIVITIES.

STOCKPILE PROTECTION

- PERIMETER CONTROL SHALL BE INSTALLED AROUND ERODIBLE STOCKPILES
- BEST MANAGEMENT PRACTICESS MAY HAVE TO BE REMOVED AND REPLACED EACH SHIFT
- STOCKPILE BEST MANAGEMENT PRACTICES WILL PROTECT FROM WIND AND STORMWATER PROTECTION

TIMING OF BEST MANAGEMENT PRACTICE INSTALLATION

- PLACEMENT OF RIPRAP SHALL BEGIN WITHIN 24 HOURS OF COMPLETION OF THE CULVERT PLACEMENT

DEWATERING

- DEWATERING WILL BE DONE BY THE APPROVED WATER HANDLING PLAN AND IS SUBSIDIARY TO 602.2012.1000 ALUMINUM STRUCTURAL PLATE PIPE

HAULING

- ENSURE LOADS ARE STABLE AND COVERED SO THAT NO MATERIAL ESCAPEMENT OCCURS DURING HAULING ACTIVITIES.

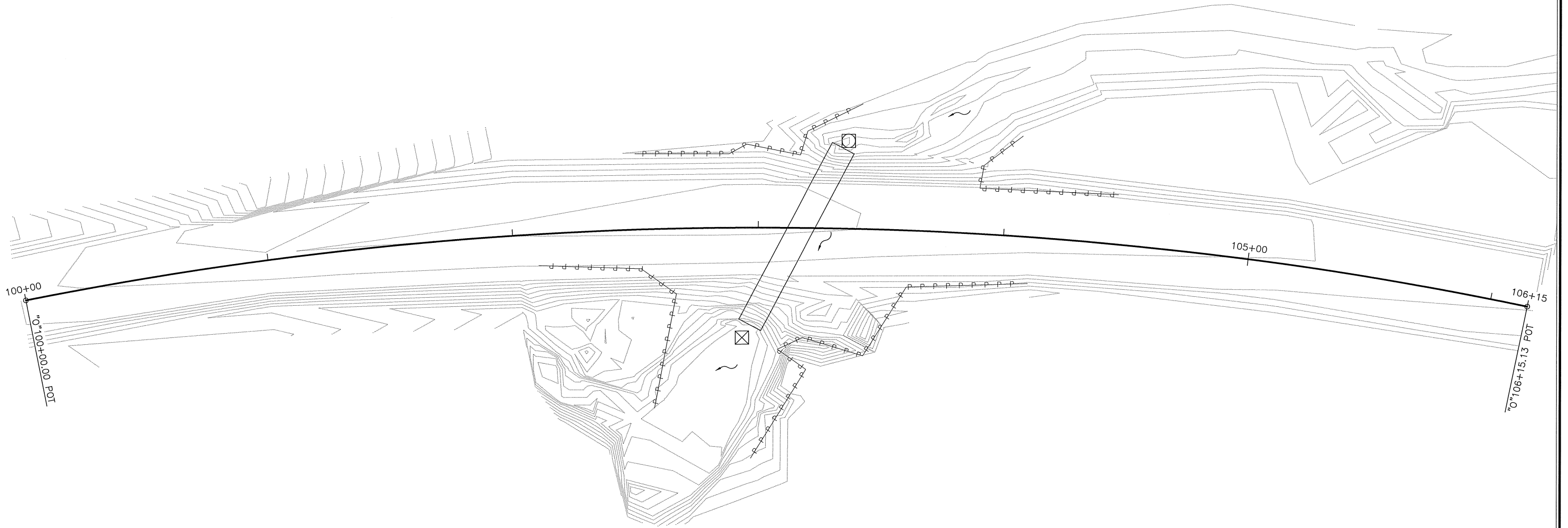
ENVIRONMENTAL INFORMATION:

- RECEIVING WATER BODIES: PIPELINE #4 CREEK A TRIBUTARY TO THE ALAGANIK SLOUGH
- IMPAIRED WATER BODIES: NONE
- TOTAL MAXIMUM DAILY LOAD (TMDL) WATERS: NONE
- THREATENED AND ENDANGERED SPECIES: NONE.
- HISTORIC & CULTURAL RESOURCE PRESENCE: NONE.
- FISH & WILDLIFE ESSENTIAL HABITAT: SEE ALASKA DEPARTMENT OF FISH&GAME FH18-11-0124 PERMIT IN APPENDIX A
- WETLANDS: SEE PERMIT IN APPENDIX A
- CONTACT THE PROJECT ENGINEER WITH QUESTIONS/CONCERNS REGARDING ENVIRONMENTAL ISSUES OR PERMIT INFORMATION.
- DAVID ZASTROW, USFS RECREATION PROGRAM MANAGER, REQUESTS NOTIFICATION AT LEAST THREE (3) BUSINESS DAYS PRIOR TO PROJECT INITIATION.
- THE CONTRACTOR WILL POWER WASH EQUIPMENT PRIOR TO BRINGING ONTO THE PROJECT.
- THE CONTRACTOR WILL NOT USE THE MCKINLEY LAKE TRAILHEAD AS A STAGING AREA.

| PROJECT SITE SUMMARY | |
|-------------------------------------------------|---------------|
| PROJECT TOTAL | 0.4 ACRES |
| DISTURBED TOTAL | 0.25 ACRES |
| PERCENTAGE IMPERVIOUS AREAS BEFORE CONSTRUCTION | .25 |
| PERCENTAGE IMPERVIOUS AREAS AFTER CONSTRUCTION | .25 |
| MEAN ANUAL PRECIPITATION (WRCC) | 153.48 INCHES |
| RUNOFF COEFFICIENT BEFORE CONSTRUCTION | 0.6 |
| RUNOFF COEFFICIENT AFTER CONSTRUCTION | 0.6 |

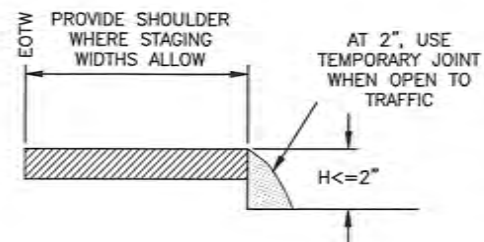
| LEGEND: | |
|-------------------|-------------------|
| PERIMETER CONTROL | — P — P — P — P — |
| INLET PROTECTION | ◻ |
| OUTLET PROTECTION | ◻ |
| FLOW ARROW | ↗ |

PLANS DEVELOPED BY: STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES, NORTHERN REGION, 2301 PEGER ROAD, FAIRBANKS, AK 99709 (907)451-2200
H:\Projects\CRH\CRH MP 21.5 Culvert\6 Design\4 C3D\1 Plots\ESCP-ESCP 2 OF 2 Thu Jan/28/21 09:34am



| NO. | DATE | REVISION | STATE | PROJECT DESIGNATION | YEAR | SHEET NO. | TOTAL SHEETS |
|-----|------|----------|--------|---------------------|------|-----------|--------------|
| | | | ALASKA | 0851071/NFWY00494 | 2021 | Q2 | 13 |

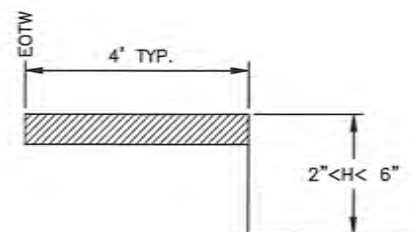
VERTICAL DROP-OFFS



CASE A

DROP-OFFS ≤ 2 INCHES
(PAVED SURFACES ONLY)

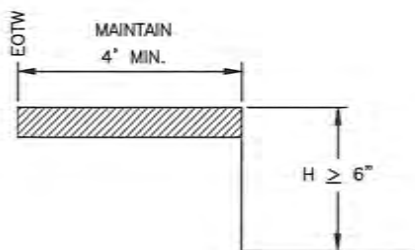
1. USE "UNEVEN LANES" (W8-11) SIGNS FOR ALL DROP-OFFS IN BETWEEN TRAFFIC LANES
2. LEAVE NO DROP-OFFS > 1.5 " IN THE TRAFFIC LANE OR ACTIVE WHEEL TRACK



CASE B

$2" < \text{DROP-OFFS} < 6"$
(ALL ROADWAY SURFACES)

1. PLACE CONES OR CANDLES FOR DROP-OFFS ≥ 4 FEET AND ≤ 30 FEET FROM EOTW.
2. USE DRUMS OR TYPE II BARRICADES FOR DROP-OFFS < 4 FEET FROM THE EOTW.



CASE C

DROP-OFFS $\geq 6"$
(ALL ROADWAY SURFACES
AND ROADSIDE SLOPES)

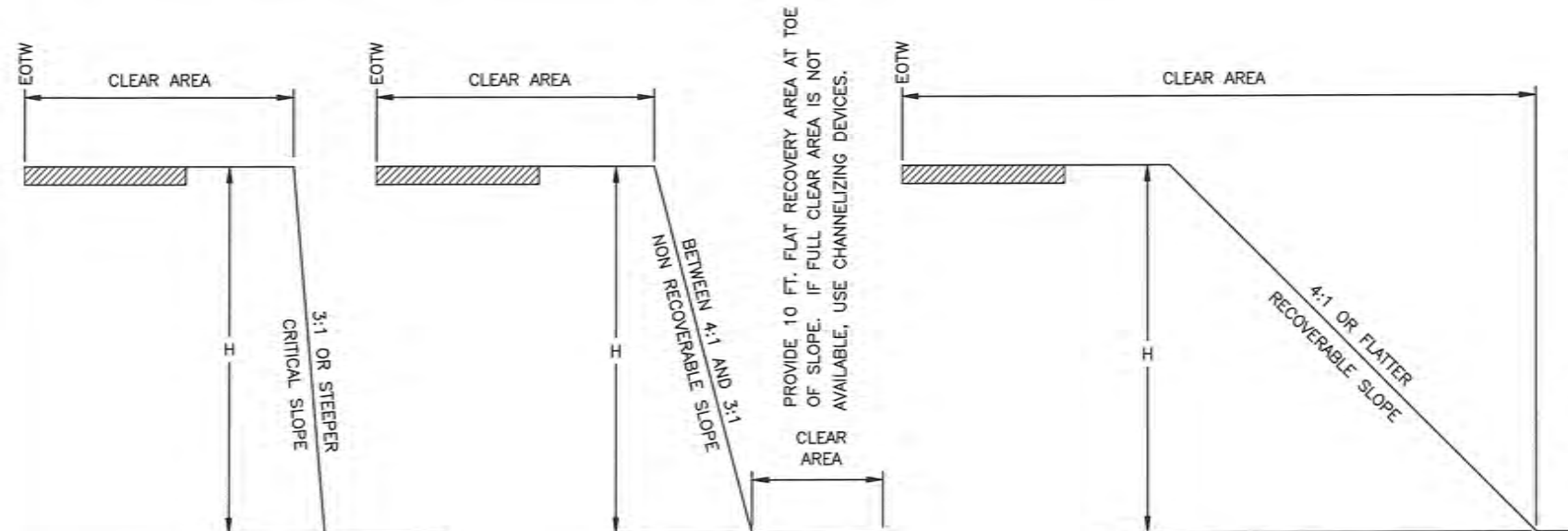
1. PLACE DRUMS OR TYPE II BARRICADES FOR DROP-OFFS $\leq 24'$ WITHIN THE CLEAR AREA.
2. PROVIDE PORTABLE CONCRETE BARRIERS FOR DROP-OFFS $> 24'$ WITHIN 15 FEET OF THE EOTW. USE DRUMS OR TYPE II BARRICADES IF BEYOND 15 FEET.

FILL SLOPES

STEEPER THAN OR EQUAL TO 3:1

BETWEEN 4:1 AND 3:1

FLATTER THAN OR EQUAL TO 4:1



CLEAR AREA REQUIREMENTS

| | LOW SPEED ≤ 35 MPH | INTERMEDIATE SPEED 40 MPH TO 45 MPH | HIGH SPEED ≥ 50 MPH |
|-------|------------------------------------------|--------------------------------------------|--------------------------------------------|
| RURAL | 15' | 24' | 30' |
| URBAN | 10' DITCH SECTIONS, OR 2' BEHIND CURB | 15' DITCH CONDITIONS, OR 2' BEHIND CURB | 15' DITCH CONDITIONS, OR 2' BEHIND CURB |

CHANNELIZING DEVICE REQUIREMENTS FOR SLOPES 3:1 OR STEEPER WITHIN THE CLEAR AREA

| | H $\leq 15'$ | H $> 15'$ |
|----------------------------|----------------------------|-----------------------------------------------------|
| < 2000 VPD LOW VOLUME | CANDLES OR CONES | TYPE II BARRICADES OR DRUMS |
| > 2000 VPD | TYPE II BARRICADE OR DRUMS | PORTABLE CONCRETE BARRIER OR TEMPORARY GUARDRAIL |

TRAFFIC CONTROL NOTES:

1. USE THE EXISTING CROSS-SECTION (PRIOR TO CONSTRUCTION) AS A BASIS FOR DETERMINING WHEN CHANNELIZING DEVICES ARE NEEDED.
2. INSTALL CHANNELIZING DEVICES WHEN THE HORIZONTAL OR VERTICAL CURVATURE IS MADE MORE SEVERE.
3. INSTALL FLEXIBLE DELINEATORS WHEN ALL VEGETATION OVER 4 FEET HIGH IS CLEARED FROM FILL SLOPES THAT ARE 3:1 OR STEEPER IN THE CLEAR AREA.
4. USE PORTABLE CONCRETE BARRIER FOR WARRANTING CONDITIONS WHICH LAST LONGER THAN 3 DAYS. FOR CONDITIONS LASTING LESS THAN 3 DAYS, OTHER CHANNELIZING DEVICES MAY BE INSTALLED.
5. TERMINATE RUNS OF PORTABLE CONCRETE BARRIER USING THE FOLLOWING METHODS:
 - A) CONNECT TO A PORTABLE CRASH CUSHION, OR
 - B) PROVIDE A CONCRETE BARRIER WITH THREE BEAM TRANSITION TO W-BEAM GUARDRAIL, TREATED WITH A PARALLEL TERMINAL (SEE SECTION 710).
 - C) FLARE THE ENDS OF THE PORTABLE CONCRETE BARRIER AWAY FROM THE ROADWAY AT A RATE OF 7:1 ON A COMPACTED SLOPE OF 6:1 OR FLATTER, OUTSIDE OF THE CLEAR AREA. INSTALL A SLOPING PORTABLE CONCRETE BARRIER END TREATMENT, OR
 - D) BURY IN THE BACKSLOPE.

6. TERMINATE THE RUNS OF TEMPORARY W-BEAM GUARDRAIL USING THE FOLLOWING METHODS:
 - A) PROVIDE A PARALLEL TERMINAL (SEE SECTION 710)
 - B) FLARE THE ENDS OF THE TEMPORARY GUARDRAIL AWAY FROM THE ROADWAY AT A RATE OF 6:1 ON A COMPACTED SLOPE OF 6:1 OR FLATTER OUTSIDE OF THE CLEAR AREA, TERMINATE WITH A STANDARD W-BEAM END SECTION, OR
 - C) BURY IN THE BACKSLOPE.

EQUIPMENT NOTES:

1. WHEN THERE IS ACTIVE, NONMOBILE CONSTRUCTION EQUIPMENT WITHIN THE CLEAR AREA, DELINEATE THE ROADSIDE WITH TRAFFIC CONES.
2. SEPARATE PROCEDURES ARE REQUIRED FOR MOBILE WORK ZONE OPERATIONS AND SHORT DURATION WORK OF LESS THAN 12 HOURS.

WINTER SHUTDOWN NOTES:

1. WHEN REQUIRED, USE CHANNELIZING DEVICES WHICH CAN BE MAINTAINED OVER WINTER.
2. NO CHANNELIZING DEVICES ARE REQUIRED IF:
 - A) CONSTRUCTION SLOPES ARE RECOVERABLE, AND
 - B) SLOPES ARE SMOOTH AND COMPACTED, AND
 - C) REQUIRED CLEAR AREA IS PROVIDED

REVISIONS

| DESCRIPTION | BY | DATE |
|-----------------------------------|-----|----------|
| CREATED | GG | 11/20/03 |
| CLARIFIED DETAILS | CA | 01/31/06 |
| UPDATED ET-PLUS NOMENCLATURE | CFJ | 02/02/10 |
| UPDATED 6A | CMA | 07/18/11 |
| NATIONAL CAD STDS | SP | 02/13/15 |
| NOTE TO DESIGNERS & MINOR CHANGES | SP | 12/05/18 |

TSM107



PLANS DEVELOPED BY: STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES, NORTHERN REGION, 2301 PEGER ROAD, FAIRBANKS, AK 99709 (907)451-2200
H:\Projects\CRH\GRH MP 21.5 Culvert\6 Design\4 CDD\1 Plate TSM107-ROAD CLOSURE Thu, Jan/28/21 09:39am

| NO. | DATE | REVISION | STATE | PROJECT DESIGNATION | YEAR | SHEET NO. | TOTAL SHEETS |
|-----|------|----------|--------|---------------------|------|-----------|--------------|
| | | | ALASKA | 0851071/NFHWY00494 | 2021 | T2 | 13 |

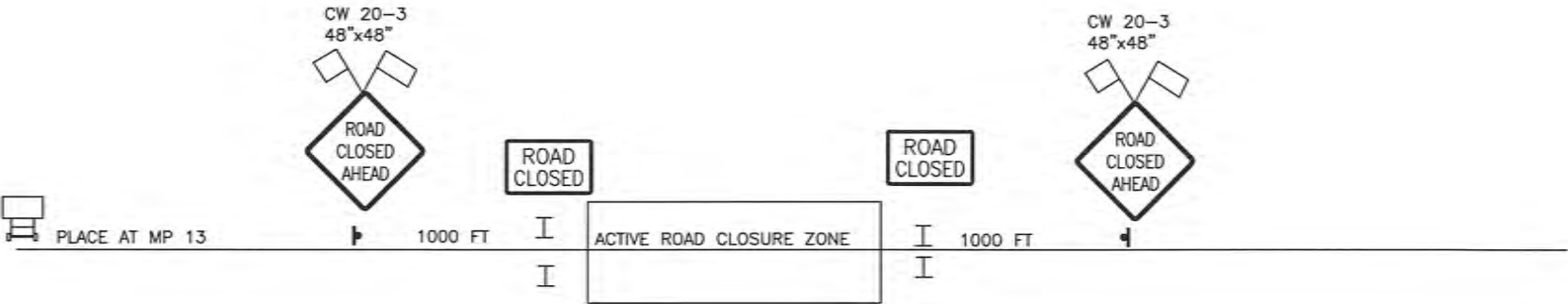
643.2016.0000 ROAD CLOSURE LUMP SUM ESTIMATING FACTOR

| ITEM | DESCRIPTION | QUANTITY | COMMENTS |
|---------------|----------------------------------------|----------|--------------------------------------------|
| 643.0004.0000 | CONSTRUCTION SIGNS | 4 | |
| 643.0006.0000 | TYPE 3 BARRICADE | 4 | |
| 643.0024.0000 | PORTABLE CHANGEABLE MESSAGE BOARD SIGN | 1 | INSTALL 2 WEEKS PRIOR TO CLOSURE, AT MP 13 |

LEGEND

- TYPE 3 BARRICADE WITH R11-2 SIGN
- ROAD CLOSURE SIGN
- PORTABLE CHANGEABLE MESSAGE BOARD SIGN
- HIGH LEVEL WARNING DEVICE

- ROAD CLOSURE NOTES:
- THIS IS SCHEMATIC AND MAY VARY BASED ON ACTUAL CONDITIONS. MODIFY AND ADJUST DISTANCES ACCORDING TO SITE CONDITIONS.
 - PROVIDE 2 WEEKS ADVANCE PUBLIC NOTICE PRIOR TO CLOSING ROAD.
 - PROVIDE EMERGENCY VEHICLES WITH ACCESS THROUGH THE PROJECT.
 - PROVIDE SEPARATE 1 WEEK ADVANCE NOTICE TO U.S. FOREST SERVICE, AK DOT MAINTENANCE AND OPERATIONS, LOCAL TOUR OPERATORS, AND ALASKA STATE TROOPERS PRIOR TO CLOSING ROAD.
 - ROAD MAY BE CLOSED FOR A MAXIMUM OF 7 CONSECUTIVE DAYS.
 - ROAD CLOSURE MAY NOT BLOCK ACCESS TO MCKINLEY CREEK TRAILHEAD.



ROAD CLOSURE

