Typical Tailwall Section

Finish Grade
EL 145' AT DOCK FACE

Temporary Ramp

Existing Ground

30' HP 14x89 Anchor Pile

6"Ø STD PIPE Bullrail

2.3%

EL 147.3'

WL @ 284,300 CFS

EL 148.5'

WL @ 150,000 CFS

WYEBE

4' WYE

TRUCK TIRE FENDER, TYP

45' PS31 Face Sheets

Design Scour (Per AEC)

Mudline

Tailwall Section Adjacent to Ramp

Finish Grade
EL 145' AT DOCK FACE

Temporary Ramp

Existing Ground

30' HP 14x89 Anchor Pile

6"Ø STD PIPE Bullrail

2.3%

EL 147.3'

WL @ 284,300 CFS

EL 148.5'

WL @ 150,000 CFS

WYEBE

4' WYE

TRUCK TIRE FENDER, TYP

45' PS31 Face Sheets

Design Scour (Per AEC)

Mudline

Jungjuk Port Tailwall Sections

Associated Engineering Drawings

NAD 1983 UTM Zone 4N

DONLIN GOLD PROJECT

APPLICANT: Donlin Gold, LLC

4720 Business Park Blvd., Suite G-25

Anchorage, Alaska 99503

AS SHOWN

JUNGJUK PORT TAILWALL SECTIONS

DATE: 8/11/2015

DATE: 8/11/2015

TA-301D2

DATE: 8/11/2015

DATE: 8/11/2015

TA-301D2

DRAWING TITLE: 03 Tailwall Sections.dwg (PND) JUL 2015

FILE NO.: PND-1995-120

8/11/2015
EL 127.3' WL @ 38,800 CFS

EL 147.3' WL @ 284,300 CFS

EL 143' WL @ 150,000 CFS

FINISH GRADE
EXISTING GROUND

100.0'
VERTICAL CURVE

OPEN CELL SHEET PILE BM HEAD

FINISH GRADE CONTAINER STORAGE
FINISH GRADE RAMP
EXISTING GROUND
North Fork Getmuna Creek Floodway No.1 Culvert, 900mm (36in.) dia.

North Fork Getmuna Creek Floodway No.2 Culvert, 1500mm (60in.) dia.

South Fork Getmuna Creek Floodway No.1 Culvert, 900mm (36in.) dia.

South Fork Getmuna Creek Floodway No.2 Culvert, 1500mm (60in.) dia.

DONLIN GOLD PROJECT

APPLICANT: Donlin Gold, LLC
4720 Business Park Blvd., Suite G-25
Anchorage, Alaska 99503

Associated Engineering Drawings

ACAD-Donlin Jungjuk Alignment and toes.dxf (Recon);
Donlin_Jungjuk_MaterialSites_Rev3_150202 (Recon)

PLAN VIEW
ACCESS ROAD
ENGINEERING MAP

FILE NO.
POA-1995-120

TA-304B
8/12/2015
1 inch = 1,000 feet

Basemap Source: Sources: Esri, USGS, NOAA
North Getmuna Creek

15-FSA
FSA Material
Site 09

16-FSA
FSA Material Site
08 - Access Road

17-FSA
FSA Material
Site 08

State-Owned:
Tentatively Approved (TA) or Patented Land

Kuskokwim Corp
(Surface) and
Calista Corp
(Subsurface) Patented
or IC Land [12(a)]

To Port
To Mine

Unnamed stream Culvert,
1200mm (48in.) dia.

Two Bull Creek Culvert,
1200mm (48in.) dia.

1 inch = 1,000 feet

General Grant Selection

Associated Engineering Drawings
ACAD-Donlin Jungjuk Alignment and toes.dxf (Recon)

FILE NO.
POA-1995-120

TA-305A

DONLIN GOLDFIELD PROJECT
APPLICANT: Donlin Gold, LLC
4720 Business Park Blvd., Suite G-25
Anchorage, Alaska 99503

PLAN VIEW
ACCESS ROAD
WETLANDS MAP

SCALE: 1" = 1,000' (305 m)
PATH: C:\Users\aradel\Dropbox\Donlin\181202_010_Mapping_404_Support\Revision_A\TA_3XXA_Road_MB_ABR_20150812.mxd

DATE:
NAD 1983 UTM Zone 4N
8/12/2015

Basemap Source: Sources: Esri, USGS, NOAA

Land Status: Mosaic, Upland, Wetlands, Powerline, Culvert
Road Milepost: Mosaic
Waters: Bridge, Project Disturbance Limit, 10' Contour, 100' Contour, Stream Flow Direction
Proposed Jungjuk Road: Upland, Wetlands, Project Disturbance Limit, 10' Contour, 100' Contour, Stream Flow Direction, Named River/Stream,
Unnamed River/Stream: Upland, Wetlands, Project Disturbance Limit, 10' Contour, 100' Contour, Stream Flow Direction, Named River/Stream,
State-Owned: Tentatively Approved (TA) or Patented Land

10' Contour
100' Contour
Stream Flow Direction
Proposed Jungjuk Road
Unnamed River/Stream
Named River/Stream
MATERIAL SITE 02 PLAN VIEW

SCALE 1" = 400'

MATERIAL SITE 02 CROSS-SECTION A-A'

HORIZONTAL SCALE 1" = 200'
VERTICAL SCALE 1" = 40'

MATERIAL SITE 02 CROSS-SECTION B-B'

HORIZONTAL SCALE 1" = 200'
VERTICAL SCALE 1" = 40'

EXISTING SURFACE

EXCAVATION LIMITS

SITE LIMITS

FUEL STORAGE

JUNGJUK ROAD ALIGNMENT (MILE 4.0)

SITE LIMITS

TO MINE SITE

TO JUNGJUK PORT

B-B'

A-A'

POA-1995-120

ASSOCIATED ENGINEERING DRAWINGS

DONLIN GOLDFIELD PROJECT

APPLICANT: Donlin Gold, LLC

4720 Business Park Blvd., Suite 125

Anchorage, Alaska 99518

MATERIAL SITE 02

LAYOUT AND SECTIONS

SCALE 1" = 400'

534500 535000

6874000

892' 950'

980'

A

B

CROSS-SECTION A-A'

CROSS-SECTION B-B'

Existing 10' Contours

Existing 50' Contours

Proposed 10' Contours

Proposed 20' Contours

Cut Area

Proposed Drainage Direction

Overburden And Growth Media Stockpile

Temporary Fuel Storage

Donlin_Jungjuk_MaterialSites_Rev3_150202.dwg (RECON) FEB 2015
NOTES:

1. DESIGN LIFE: 25 YEARS
2. HYDROLOGY STUDY REQUIRED.
3. ENVIRONMENTAL SITE INVESTIGATION REQUIRED.
4. CONTOUR ELEVATIONS ARE IN METERS.
5. ALLOWABLE PRESSURE OF SOIL = 10,400 psf [500 kPa]
6. GUARDRAIL WILL INCLUDE SPLASH GUARD SKIRT.
7. DIMENSIONS ARE SUBJECT TO CHANGE / NOT FOR CONSTRUCTION.

DESIGN TRUCKS:
- AUTOCLAVE VESSEL TRANSPORTER:
  - DOUBLE 19-LINE INTERCOMBI SCHEUERLE TRAILERS
- 785C MINING TRUCK (EMPTY)
- L-100 OFF HIGHWAY TRUCK
- AUTOCLAVE TRAILER AND 785C TRUCK SHALL TRAVEL ON CENTERLINE OF BRIDGE WITH MAXIMUM SPEED OF 10 km/h TO REDUCE THE DYNAMIC IMPACT ON THE BRIDGE STRUCTURE.

ASSOCIATED ENGINEERING DRAWINGS

APPLICATION:
DONLIN GOLD PROJECT
APPLICANT: Donlin Gold, LLC
4720 Business Park Blvd., Suite G-25
Anchorage, Alaska 99503

PLAN AND DETAILS

8/11/2015

AS SHOWN

DRAWING TITLE:
CROOKED CREEK BRIDGE AND ROAD ALIGNMENT
PLAN AND DETAILS

SCALE: 1" = 20'

CROOKED CREEK BRIDGE SECTION A-A'

SCALE: 1" = 20'

CROOKED CREEK BRIDGE SECTION B-B'

SCALE: 1" = 10'

CROOKED CREEK BRIDGE PLAN

SCALE: 1" = 20'

PATH: C:\Users\mlengiewicz\Dropbox\Donlin\181202_010_mapping_404_support\revision_a\TA_Crooked_Creek_Xing_ML_20150811.dwg

Sprinkles Creek Bridge Plan Scale 1" = 20' West Abutment East Abutment Bridge and Road Alignment Rock Basket Gabions (Typ.) PRECAST CONCRETE FOOTING (Typ.) ROCK BASKET GABIONS (TYP.) BRIDGE DECK EL. 342.7 STEEL GUARDRAIL (TYP.) 8'-3" BRIDGE AND ROAD ALIGNMENT 24'-5" PRECAST CONCRETE BALLAST WALL PRECAST CONCRETE DECK PANEL BRIDGE AND ROAD ALIGNMENT 8'-3" STEEL GUARDRAIL (Typ.) STEEL GIRDER PRECAST CONCRETE FOOTING (Typ.) EXISTING GRADE PRECAST CONCRETE BALLAST WALL ABUTMENT AND COLUMNS SANDWICH BEARING PANEL PRECAST CONCRETE DECK PANEL PRECAST CONCRETE BALLAST WALL PRECAST CONCRETE DECK PANEL PRECAST CONCRETE BALLAST WALL NOTE: CROOKED CREEK BRIDGE SECTION A-A' NOTE: CROOKED CREEK BRIDGE SECTION B-B'
NOTES:

1. CLEARING LIMITS ARE TOE OF FILL.
2. SUBBASE GRADING B: TO CONSIST OF 3" MINUS, WELL GRADED, GRANULAR MATERIAL WITH 6 TO 10% PASSING THE 200 SIEVE. MATERIAL TO BE DURABLE.
3. SELECT MATERIAL TYPE B: TO CONSIST OF COARSE ROCK OR GRAVEL. NON-FROST-SUSCEPTIBLE.
4. DEPTH OF FILL WILL VARY DEPENDING ON SOIL TYPE AND CONDITION. 6' TOTAL EMBANKMENT DEPTH WILL TYPICALLY BE THE MINIMUM.
5. TO THE EXTENT POSSIBLE, NATIVE VEGETATION AND GROUND SURFACE TO BE LEFT INPLACE.

NOTES:

1. CLEARING LIMITS MIN. 3.3 BEYOND TOP OF CUT OR TOE OF FILL.
2. SUBBASE GRADING B: TO CONSIST OF 3" MINUS, WELL GRADED, GRANULAR MATERIAL WITH 6 TO 10% PASSING THE 200 SIEVE. MATERIAL TO BE DURABLE.
3. SELECT MATERIAL TYPE B: TO CONSIST OF COARSE ROCK OR GRAVEL. NON-FROST-SUSCEPTIBLE.
4. DEPTH OF FILL WILL VARY DEPENDING ON SOIL TYPE AND CONDITION. 3.3' TOTAL EMBANKMENT DEPTH WILL TYPICALLY BE THE MINIMUM.
5. BACKSLOPES WILL VARY DEPENDING UPON SOIL TYPES OR ROCK CHARACTERISTICS.
   TYPICAL:
   3.0 : 1 FOR WET SILTY COLLUVIAL SOIL
   2.0 : 1 FOR WELL DRAINED Silt and Silty Gravel
   1.5 : 1 FOR WELL DRAINED Silt and Silty Gravel UP TO 1.0 : 1 FOR ROCK
6. ACCOMODATE EXCESS EXCAVATION AND WASTE DISPOSAL BY FLATTENING AND/OR EXTENDING INSLOPE. EXTENT TO BE DETERMINED BY FIELD ENGINEER.
NOTES:

1. CLEARING LIMITS TO BE MIN. 10' EACH SIDE OF POWER POLE.
2. MULCH AND ORGANIC DEBRIS FROM CLEARING TO REMAIN ON GROUND SURFACE.
3. SOIL NOT TO BE DISTURBED EXCEPT AT SPECIFIC LOCATIONS AS PERMITTED.
4. DIMENSIONS ARE APPROXIMATE.
NOTE:
- STRUCTURE LENGTH AND HEAD/WING WALL LAYOUT TO BE DETERMINED PENDING FINAL SITE SURVEY AND GRADING PLAN.

* MHW ELEVATION IS FOR GRAPHIC DISPLAY ONLY, THE ACTUAL ELEVATIONS ARE PENDING HYDROLOGIC AND HYDRAULIC STUDY AND DESIGN.

HW = HEADWALL WIDTH (BOTH ENDS)
C MIN. = MIN. COVER
C MAX. = MAX. COVER
IR = INSIDE RISE
MHW ELEV.
IS = INSIDE SPAN
CLS = L. SPAN

<table>
<thead>
<tr>
<th>Location</th>
<th>Width (W)</th>
<th>Length (L)</th>
<th>HW (W)</th>
<th>IR (H)</th>
<th>C MIN.</th>
<th>C MAX.</th>
<th>IS</th>
<th>CLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Fork Getmuna Creek</td>
<td>67'-9&quot;</td>
<td>44'-5&quot;</td>
<td>48'</td>
<td>10'-1&quot;</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>44'-0&quot;</td>
<td>44'-5'-0&quot;</td>
</tr>
<tr>
<td>South Fork Getmuna Creek</td>
<td>70'</td>
<td>44'-5&quot;</td>
<td>48'</td>
<td>10'-1&quot;</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>44'-0&quot;</td>
<td>44'-5'-0&quot;</td>
</tr>
<tr>
<td>Getmuna Tributary Creek</td>
<td>70'</td>
<td>30'-10&quot;</td>
<td>40'</td>
<td>9'-11&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
<td>30'-5&quot;</td>
<td>30'-10'-0&quot;</td>
</tr>
<tr>
<td>Upper Jungjuk Creek</td>
<td>50'</td>
<td>29'-11&quot;</td>
<td>32'</td>
<td>10'-10&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
<td>29'-6&quot;</td>
<td>29'-11'-0&quot;</td>
</tr>
<tr>
<td>Lower Jungjuk Creek</td>
<td>40'-7&quot;</td>
<td>67'-6&quot;</td>
<td>44'</td>
<td>14'-10&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
<td>40'-2&quot;</td>
<td>40'-7'-0&quot;</td>
</tr>
</tbody>
</table>

Dimensions based on reference drawings SP10-04316, S101, S201, S202, S203, S204, S205, S206, S207 from Big River Bridge Concept Drawings.
CULVERT DIA. VARIES
MINIMUM COVER
EXISTING GROUND
JUNGJUK ROAD SURFACE
CULVERT BEDDING
NOTE: MINIMUM COVER AND CULVERT BEDDING TO BE DETERMINED WITH SITE SPECIFIC DESIGN.

STREAM
JUNGJUK ROAD
GRADING LIMITS
28'
A-A'
316T

TYPICAL CULVERT PLAN
SCALE 1" = 20'

TYPICAL CULVERT SECTION A-A'
SCALE 1" = 1'

NOTE: MINIMUM COVER AND CULVERT BEDDING TO BE DETERMINED WITH SITE SPECIFIC DESIGN.
NOTE:
STOCKPILE WILL VARY IN SIZE AND SHAPE THROUGHOUT THE MINE LIFE. AT THE END OF MINE LIFE, ALL STOCKPILED ORE WILL BE FED TO THE PLANT AND THE STOCKPILE WILL NO LONGER EXIST.
CONSTRUCTION LAYDOWN AREA 6 PLAN

NOTE:
1. ALL EXISTING CONTOUR ELEVATIONS ARE IN FEET UNLESS NOTED OTHERWISE.
2. ALL PROPOSED ELEVATIONS AND DIMENSIONS ARE IN FEET UNLESS NOTED OTHERWISE.

CONSTRUCTION LAYDOWN AREA 6 SECTION A-A'

CONSTRUCTION LAYDOWN AREA 6 SECTION B-B'

NOTES:
1. ALL EXISTING CONTOUR ELEVATIONS ARE IN FEET UNLESS NOTED OTHERWISE.
2. ALL PROPOSED ELEVATIONS AND DIMENSIONS ARE IN FEET UNLESS NOTED OTHERWISE.
TERRACE BORROW SITE 3 - NORTH TSF OVERBURDEN STOCKPILE PLAN

TERRACE BORROW SITE 3 - NORTH TSF OVERBURDEN STOCKPILE SECTION A-A'

HORIZONTAL SCALE 1" = 400'
VERTICAL SCALE 1" = 80'

TERRACE BORROW SITE 3 - NORTH TSF OVERBURDEN STOCKPILE SECTION B-B'

HORIZONTAL SCALE 1" = 400'
VERTICAL SCALE 1" = 80'

NOTE:
* BORROW LIMIT SUBJECT TO CHANGE PENDING FURTHER GEOTECHNICAL INVESTIGATION
NOTES:
1. ALL EXISTING ELEVATIONS ARE IN FEET UNLESS NOTED OTHERWISE.
2. ALL PROPOSED ELEVATIONS AND DIMENSIONS ARE IN FEET UNLESS NOTED OTHERWISE.
TERRACE BORROW SITE 4

NOTE:
AREA TO BE USED AS A BORROW SITE AND LATER PARTIALLY USED AS AN OVERBURDEN STOCKPILE.

NOTE:
* BORROW LIMIT SUBJECT TO CHANGE PENDING FURTHER GEOTECHNICAL INVESTIGATION.
NOTE:
AREA TO BE USED AS A BORROW SITE AND LATER PARTIALLY USED AS AN OVERBURDEN STOCKPILE.

NOTE:
BORROW LIMIT SUBJECT TO CHANGE PENDING FURTHER GEOTECHNICAL INVESTIGATION.

EXISTING GROUND

PROPOSED GRADE

TERRACE BORROW SITE 5 SECTION A-A'
HORIZONTAL SCALE 1" = 400'
VERTICAL SCALE 1" = 80'

TERRACE BORROW SITE 5 SECTION B-B'
HORIZONTAL SCALE 1" = 400'
VERTICAL SCALE 1" = 80'

EXISTING GROUND

PROPOSED GRADE

TERRACE BORROW SITE 5 PLN
SCALE 1" = 400'

TERRACE BORROW SITE 5 SECTION A-A'
HORIZONTAL SCALE 1" = 400'
VERTICAL SCALE 1" = 80'

TERRACE BORROW SITE 5 SECTION B-B'
HORIZONTAL SCALE 1" = 400'
VERTICAL SCALE 1" = 80'

NOTE:
AREA TO BE USED AS A BORROW SITE AND LATER PARTIALLY USED AS AN OVERBURDEN STOCKPILE.

NOTE:
BORROW LIMIT SUBJECT TO CHANGE PENDING FURTHER GEOTECHNICAL INVESTIGATION.
SOUTH OVERBURDEN STOCKPILE 2019 PLAN
SCALE 1" = 500'

NOTE: DRAINAGE AND EROSION CONTROLS WILL BE DEVELOPED WITHIN THE DISTURBANCE FOOTPRINT.

SOUTH OVERBURDEN STOCKPILE 2019 SECTION A-A'
HORIZONTAL SCALE 1" = 500'
VERTICAL SCALE 1" = 100'

SOUTH OVERBURDEN STOCKPILE 2019 SECTION B-B'
HORIZONTAL SCALE 1" = 500'
VERTICAL SCALE 1" = 100'

EXISTING GROUND
PROPOSED GRADE

SOUTH OVERBURDEN STOCKPILE 2019
PROJECT DISTURBANCE

EXISTING 10' CONTOURS
PROJECT DISTURBANCE

EXISTING 50' CONTOURS
FILL AREA
CUT AREA
EXISTING GROUND
PROPOSED GRADE

0 500 1000 1500 FT
0 250 500 750'
NOTES:
1. ALL EXISTING CONTOUR ELEVATIONS ARE IN FEET UNLESS NOTED OTHERWISE.
2. ALL PROPOSED ELEVATIONS AND DIMENSIONS ARE IN FEET UNLESS NOTED OTHERWISE.
NOTE: DRAINAGE AND EROSION CONTROLS WILL BE DEVELOPED WITHIN THE DISTURBANCE FOOTPRINT.
NOTE:
DRAINAGE AND EROSION CONTROLS WILL BE DEVELOPED WITHIN THE DISTURBANCE FOOTPRINT.
NOTE: AREA TO BE USED AS A BORROW SITE AND LATER PARTIALLY USED AS AN OVERBURDEN STOCKPILE.

NOTE: BORROW LIMIT SUBJECT TO CHANGE PENDING FURTHER GEOTECHNICAL INVESTIGATION.
NOTES:
1. ALL EXISTING CONTOUR ELEVATIONS ARE IN FEET UNLESS NOTED OTHERWISE.
2. ALL PROPOSED ELEVATIONS AND DIMENSIONS ARE IN FEET UNLESS NOTED OTHERWISE.
NOTE:
AREA TO BE USED AS A BORROW SITE AND LATER PARTIALLY USED AS AN OVERBURDEN STOCKPILE.

NOTE:
BORROW LIMIT SUBJECT TO CHANGE PENDING FURTHER GEO TECHNICAL INVESTIGATION.
NOTE: DRAINAGE AND EROSION CONTROLS WILL BE DEVELOPED WITHIN THE DISTURBANCE FOOTPRINT.
CONSTRUCTION LAYDOWN AREA
TAILINGS STORAGE FACILITY LIMITS
HAUL ROAD
TAILINGS STORAGE FACILITY LIMITS
TAILINGS STORAGE FACILITY SEEPAGE RECOVERY DAM
TAILINGS STORAGE FACILITY OVERBURDEN STOCKPILES

TSF SEEPAGE RECOVERY SYSTEM POND PLAN
SCALE 1" = 400'
FSA MATERIAL SITE UPPER AMERICAN CREEK PLAN

SCALE 1" = 300'

FSA MATERIAL SITE UPPER AMERICAN CREEK

PROPOSED BORROW EXCAVATION LIMIT

Existing 10' Contours
Existing 50' Contours
Fill Area
Cut Area
Project Disturbance
Borrow Excavation Limit
Existing Grade
Proposed Grade

NOTE:
* BORROW LIMIT SUBJECT TO CHANGE PENDING FURTHER GEOTECHNICAL INVESTIGATION

FSA MATERIAL SITE UPPER AMERICAN CREEK SECTION A-A'

VERTICAL SCALE 1" = 60'

FSA MATERIAL SITE UPPER AMERICAN CREEK SECTION B-B'

VERTICAL SCALE 1" = 60'

NOTE:
UPPER_CONTACT_WATER_DAM_QUARRY.dwg (BGC) JUNE 2012

ASSOCIATED ENGINEERING DRAWINGS

WATER RESOURCES

PATH: C:\Users\mlengiewicz\Dropbox\Donlin\181202_010_mapping_404_support\revision_a\MA_Upper_Contact_Water_Dam_Quarry.dwg
FSA MATERIAL SITE UPPER AMERICAN RIDGE PLAN

SCALE 1" = 200'

TO PLANT SITE

WASTE FACILITY LIMITS

WASTE ROCK BUFFER LIMITS

ROAD (TYP.)

FSA MATERIAL SITE UPPER AMERICAN RIDGE

EXISTING 10' CONTOURS

EXISTING 50' CONTOURS

PROJECT DISTURBANCE
3% VARIES (2:1 TYP.)

SECTION TYPICAL FOR WETLAND AND PERMAFROST INTERVALS IN MOSTLY LEVEL TERRAIN.

ROAD TYPICAL SECTION FOR WETLAND OR PERMAFROST AREAS

NOTES:

1. CLEARING LIMITS MIN. 10' BEYOND TOP OF CUT OR TOE OF FILL.
2. SUBBASE GRADING B; TO CONSIST OF 3" MINUS, WELL GRADED, GRANULAR MATERIAL WITH 6 TO 10% PASSING THE 200 SIEVE. MATERIAL TO BE DURABLE.
3. SELECT MATERIAL TYPE B; TO CONSIST OF COARSE ROCK OR GRAVEL. NON-FROST-SUSCEPTIBLE.
4. DEPTH OF FILL WILL VARY DEPENDING ON SOIL TYPE AND CONDITION.
5. TO THE EXTENT POSSIBLE, NATIVE VEGETATION AND GROUND SURFACE TO BE LEFT INPLACE.
6. SAFETY BERM TO BE CONSTRUCTED TO A HEIGHT EQUAL TO ONE HALF THE TIRE DIAMETER OF THE LARGEST VEHICLE TO TRAVEL ROADWAY.

ROAD TYPICAL SECTION FOR AREAS WITH GOOD SOILS OR ROCK

NOTES:

1. CLEARING LIMITS MIN. 10' BEYOND TOP OF CUT OR TOE OF FILL.
2. SUBBASE GRADING B; TO CONSIST OF 3" MINUS, WELL GRADED, GRANULAR MATERIAL WITH 6 TO 10% PASSING THE 200 SIEVE. MATERIAL TO BE DURABLE.
3. SELECT MATERIAL TYPE B; TO CONSIST OF COARSE ROCK OR GRAVEL. NON-FROST-SUSCEPTIBLE.
4. DEPTH OF FILL WILL VARY DEPENDING ON SOIL TYPE AND CONDITION.
5. BACKSLOPES WILL VARY DEPENDENT UPON SOIL TYPES OR ROCK CHARACTERISTICS.

TYPICAL:

3.0 : 1 FOR WET SILTY COLLUVIAL SOIL
2.0 : 1 FOR WELL DRAINED SILT AND SILTY GRAVEL
1.5 : 1 FOR WELL DRAINED SILT AND SILTY GRAVEL UP TO 1.0 : 1 FOR ROCK

6. ACCOMODATE EXCESS EXCAVATION AND WASTE DISPOSAL BY FLATTENING AND/OR EXTENDING INSLOPE. EXTENT TO BE DETERMINED BY FIELD ENGINEER.
7. SAFETY BERM TO BE CONSTRUCTED TO A HEIGHT EQUAL TO ONE HALF THE TIRE DIAMETER OF THE LARGEST VEHICLE TO TRAVEL ROADWAY.
TYPICAL CROSS SECTION FOR GENERAL PURPOSE MINE HAUL ROADS

TYPICAL CROSS SECTION FOR CONSTRUCTION HAUL ROADS
14" DIA PIPE
(STACKED 5 HIGH)

BERMS

PIPE YARD
LOADING AREA

TYPICAL PIPE STORAGE YARD PLAN

TYPICAL PIPE STORAGE YARD
ROPE INSTALLATION

1. ROPE SPACING SHOULD BE A MAXIMUM OF 6.0 FEET FROM THE PIPE ENDS.
2. THE INTERVALS BETWEEN RINGS SHOULD BE BETWEEN 10.0 FEET AND 20.0 FEET WITH A MINIMUM OF SIX LOOPS SPACED OVER A STANDARD TRIPLE RANDOM LENGTH (60 FEET).
3. THE INTERVALS MUST BE ADJUSTED TO INSURE THERE IS NO PIPE TO PIPE CONTACT. ROPE ENDS SHALL BE FUSED WITH A BLOW TORCH PRIOR TO SLIPPING THE LOOP OVER THE PIPE.

NOTES:

1. THE USE OF ALTERNATE METHODS FOR STOCKPILING PIPE AND/OR THE USE OF ALTERNATE MATERIALS FOR PREVENTING PIPE TO PIPE CONTACT SHALL REQUIRE WRITTEN APPROVAL OF THE COMPANY.
2. PIPE SHALL BE STOCKPILED AND SECURED (AS NECESSARY) TO PRECLUDE MOVEMENT OF PIPE.
3. ALL MATERIALS SHALL BE FURNISHED BY THE CONTRACTOR.
NOTES:
1. CLEARING LIMITS TO BE MIN. 10' EACH SIDE OF POWER POLE.
2. MULCH AND ORGANIC DEBRIS FROM CLEARING TO REMAIN ON GROUND SURFACE.
3. SOIL NOT TO BE DISTURBED EXCEPT AT SPECIFIC LOCATIONS AS PERMITTED.
4. DIMENSIONS ARE APPROXIMATE.
WINTER ROAD RUNNING SURFACE TYPICAL WIDTH 16'
COMPOSED OF PACKED SNOW, ICE AND MULCH FROM CLEARING.

LIMIT OF CLEARING APPROX. 30' WIDTH

TOP OF BANK OR ORDINARY HIGH WATER

LOW PROFILE SNOW BERM. TYPICALLY 30-50' EACH SIDE OF ROAD CENTERLINE

SNOW FILL RAMP AS NEEDED

STREAM CHANNEL

TYPICAL AREA OF BUILT-UP ICE

WIDTH VARIES

NOTES:
1. REFER TO CROSS SECTION DETAILS (A) & (B).
2. ICE SURFACE TO BE CLEARED OF SNOW 30-50' EACH SIDE OF ROAD CENTERLINE TO AUGMENT ICE THICKENING.
3. CLEAN SNOW FOR FILL MAY BE ACCUMULATED FROM NATURAL OPEN AREAS NEAR CROSSING SITE AND ICE SURFACE.
4. TO THE EXTENT POSSIBLE, CROSSING TO BE ORIENTED PERPENDICULAR TO ACTIVE CHANNEL.
5. WATER FOR BUILDING ICE TO BE TAKEN FROM STREAM AT CROSSING LOCATION.
6. SNOW BERMS TO BE SHAPED FOR PASSAGE OF SNOWMACHINES AND SIGNAGE PLACED WARNING OF CROSSING.
7. SNOW BERMS TO DEFINE CROSSING SITE AND AID IN CONTAINING WATER DURING FLOODING TO BUILD ICE.
8. CROSSINGS SHALL BE DEVELOPED IN ACCORDANCE WITH STATE OF ALASKA FOREST RESOURCES AND PRACTICES REGULATIONS AS THEY ADDRESS WINTER ROADS/TRAILS AND STREAM CROSSINGS.
**NOTES:**

BEFORE DEVELOPMENT, ALL CROSSING LOCATIONS SHALL BE TESTED FOR ICE THICKNESS, WATER DEPTH AND EXTENT OF GROUNDED ICE. CLEAN SNOW FOR RAMP CONSTRUCTION MAY BE GATHERED FROM OPEN AREAS ADJACENT TO THE CROSSING SITE AND TRAIL. CROSSINGS SHALL BE DEVELOPED IN ACCORDANCE WITH STATE OF ALASKA FOREST RESOURCES AND PRACTICES REGULATIONS AS THEY ADDRESS WINTER ROADS/TRAILS AND STREAM CROSSINGS. ALL CROSSINGS SHALL BE ASSESSED BY A QUALIFIED ENGINEER AND APPROVED FOR USE.

**NOTES:**

1. CLEARING LIMITS TO BE MIN. 15' EACH SIDE OF CENTERLINE OR MAX. 30' TOTAL WIDTH.
2. MULCH AND ORGANIC DEBRIS FROM CLEARING TO REMAIN ON GROUND SURFACE.
3. DEPTH OF PACKED SNOW AND ICE FOR RUNNING SURFACE WILL VARY.
4. SOIL NOT TO BE DISTURBED EXCEPT AT SPECIFIC LOCATIONS AS PERMITTED.
5. ADD TURNOUT LANE AT LOCATIONS DETERMINED BY ENGINEER. SURFACE WIDTH INCREASED TO 28' FOR TURNOUT, (APPROX. ONE PER 1/4 MILE).
WINTER ROAD TURNOUT & TURNAROUND TO BE CONSTRUCTED AT AN AVERAGE INTERVAL OF 1.2 MILE. CONSTRUCTION WILL OCCUR IN OPEN TREELESS AREAS UNLESS NO SUCH AREAS AVAILABLE.

NOTES:
1. TURNOUTS TO BE FIELD LOCATED BY ENGINEER TO BEST FIT TERRAIN CONDITIONS AND MAXIMIZE OPERATIONAL SAFETY.
2. TURNOUTS TO BE CONSTRUCTED SIMILAR TO ROAD RUNNING SURFACE.
3. OPEN AREA TURNOUTS MAY BE SHAPED AND SIZED TO BEST FIT TERRAIN AND NATURAL CLEARINGS. RADIUS IS REPRESENTATIVE ONLY.
VEHICLE PARKING

ROAD ACCESS

POWER UNIT
12' x 8'

NOTE:
- THIS IS A TYPICAL SITE SET-UP. THERE ARE VARIOUS CONFIGURATIONS USED DEPENDING UPON SITE RESTRICTIONS. FIELD MODIFICATIONS TO SUIT SITE.
- CUT/FILL SLOPES ARE 2:1 (HORIZ:VERT), TYPICAL.

SURVEY TRAILER
24'x8.5'

SUPPLY TRAILER
40'x8.5'

DRILLING RIG
53'x8.5'

MUD RIG
45'x8.5'

DISILTER

SHAKER

SPoil
CONTAINED
20'x8'

6' RECYCLED PIT
6'Wx6'Lx4D

PIPE TRAILER
40'x8.5'

CRANE
8'x8.5'

EQUIPMENT AND MATERIALS

EQUIPMENT AND MATERIALS

TYPICAL HDD ENTRY SITE EQUIPMENT LAYOUT

NOTE:
- THIS IS A TYPICAL SITE SET-UP. THERE ARE VARIOUS CONFIGURATIONS USED DEPENDING UPON SITE RESTRICTIONS. FIELD MODIFICATIONS TO SUIT SITE.
- CUT/FILL SLOPES ARE 2:1 (HORIZ:VERT), TYPICAL.

DISTURBANCE LIMIT

Associated Engineering Drawings

DONLIN GOLD PROJECT
APPLICANT: Donlin Gold, LLC
4720 Business Park Blvd., Suite E-25
Anchorage, Alaska 99503

TYPICAL HDD ENTRY SITE EQUIPMENT LAYOUT

DATE: 10/19/2015

POA-1995-120
TRENCH
SPOIL PILE
BUFFER ZONES
SPOIL PILE
WATERCOURSE
BELLHOLE
TOPSOIL OR STRIPPINGS
TEMPORARY VEHICLE CROSSINGS
OVERSIZE BELLHOLE
BORING MACHINE
TOPSOIL OR STRIPPINGS
SUBSOIL
WATERBODY
OVERSIZE BELLHOLE
BORING MACHINE
TYPICAL WATERBODY CROSSING HORIZONTAL BORE PLAN
N.T.S.
TYPICAL WATERBODY CROSSING HORIZONTAL BORE PROFILE
N.T.S.
NOTES:
1. PULLOUTS WILL BE INSTALLED AS TERRAIN ALLOWS AT APPROXIMATELY 1/4 MILE INTERVALS. ADDITIONAL PULLOUTS WILL BE CONSTRUCTED WHERE HILLY TERRAIN AND LIMITED SITE DISTANCE ARE PREVALENT.
2. TEMPORARY CONSTRUCTION TURNAROUNDS WILL BE BUILT AT EACH PULLOUT AND FIELD FIT TO MINIMIZE CLEARING.
3. ROCK FILL SHALL BE PLACED IN NO GREATER THAN 12" LIFTS AND COMPACTED.
4. ROCK FILL SHALL BE UNDERLAIN WITH GEOTEXTILE WHEN DIRECTED BY PROJECT ENGINEER.
5. PULLOUTS TO MAY BE WIDENED OR LENGTHENED WHERE NATURAL CONDITION PERMIT AND AS DIRECTED BY PROJECT ENGINEER.
6. TEMP TURNAROUND GRUB ONLY LARGE STUMPS AND PLACE FILL SUFFICIENT TO SUPPORT VEHICLES, CLEAR TO TOE OF FILL OR TOP OF CUT.

NOTES:
1. FIELD FIT AT 400-500' INTERVALS TO MINIMIZE CLEARING AND EXCAVATION.
2. PLACE FILL SUFFICIENT TO SUPPORT VEHICLES CLEAR TO TOE OF FILL OR TOP OF CUT.
3. TEMPORARY CONSTRUCTION TURNAROUNDS WILL BE BUILT AT EACH PULLOUT AND FIELD FIT TO MINIMIZE CLEARING.
4. ROCK FILL SHALL BE PLACED IN NO GREATER THAN 12" LIFTS AND COMPACTED.
5. ROCK FILL SHALL BE UNDERLAIN WITH GEOTEXTILE WHEN DIRECTED BY PROJECT ENGINEER.
6. TEMP TURNAROUND GRUB ONLY LARGE STUMPS AND PLACE FILL SUFFICIENT TO SUPPORT VEHICLES, CLEAR TO TOE OF FILL OR TOP OF CUT.
NOTES:
1. "SELECT MATERIAL" TO BE APPROVED GRANULAR SOIL
2. FILL SHALL BE UNDERLAIN WITH GEOTEXTILE WHERE SOFT UNDERLYING SOILS ARE ENCOUNTERED.
3. RESERVE TOPSOIL AND ORGANIC MATERIAL FOR STABILIZATION AND SEEDING ON CUT SLOPES.
4. CROSS DRAINS SHALL BE ARMORED WATER BARS OR CULVERTS INSTALLED AT LOCATIONS DETERMINED BY FIELD ENGINEER.
5. CLEARING LIMITS ARE TOP OF CUT AND TOE OF FILL.

SHOWFLY OR ACCESS ROAD TYPICAL SECTION

VARIABLE TERRAIN (CUT/FILL)

SHOWFLY OR ACCESS ROAD TYPICAL SECTION

LEVEL TERRAIN (FILL)

1. ALL CULVERTS SHALL BE CORRUGATED STEEL AS APPROVED BY PROJECT ENGINEER.
2. PRE-LEVEL WITH 24" OF COARSE ROCK PIPE BEDDING MATERIAL AND ENSURE MIN. 12" OF COVER.
3. CROSS CULVERTS IN UPLANDS SHALL BE INSTALLED WITH AN ENLARGED (BELL HOLE) DITCH SECTION ON THE INLET END. FILL TO 6" DEPTH WITH DITCH LINER MATERIAL.
4. CULVERT DIAM. AND LOCATION PER SUMMARY PROVIDED BY PROJECT ENGINEER (MIN. 2%).
5. CROSS CULVERTS IN UPLANDS SHALL BE Installed WITH AN ENLARGED (BELL HOLE) Ditch SECTION ON THE INLET END. FILL TO 6" DEPTH WITH Ditch LINER MATERIAL.

1. ALL CULVERTS SHALL BE CORRUGATED STEEL AS APPROVED BY PROJECT ENGINEER.
2. PRE-LEVEL WITH 24" OF COARSE ROCK PIPE BEDDING MATERIAL AND ENSURE MIN. 12" OF COVER.
3. CROSS CULVERTS IN UPLANDS SHALL BE INSTALLED WITH AN ENLARGED (BELL HOLE) DITCH SECTION ON THE INLET END. FILL TO 6" DEPTH WITH DITCH LINER MATERIAL.
4. CULVERT DIAM. AND LOCATION PER SUMMARY PROVIDED BY PROJECT ENGINEER (MIN. 2%).
1. Design and maintain bridge to withstand and pass the highest anticipated flow that may occur while the bridge is in place. Culverts must be aligned to prevent bank erosion or stream bed scour.

2. Inspect bridge elevation so bridge remains supported above high bank and does not sink into bank. Additional support must be added on top of bank and under span if initial support starts to settle. All bridges must be anchored for stability.

3. Erosion and sedimentation control measures shall be inspected and maintained. Construct sediment barriers across the entire construction R.O.W. to prevent silt laden water and spoil from flowing back into waterbody. Silt fence or sandbags may be used interchangeably.

4. Bridge decks will be kept free of soil.

5. Equipment bridges will consist of one of the following: clean rock placed over flume pipes; prefabricated construction mats; or flex-float or other temporary bridging such as Bailey bridges.

6. Remove equipment bridges and associated material as soon as possible. Restore and stabilize bed and banks to approximate pre-construction conditions.

7. Dispose of any rock as directed.
1. Design and maintain bridge to withstand and pass the highest anticipated flow that may occur while the bridge is in place. Culverts must be aligned to prevent bank erosion or stream bed scour.

2. Inspect bridge elevation so bridge remains supported above high bank, and does not sink into bank. Additional support must be added on top of bank and under span if initial support starts to settle. All bridges must be anchored for stability.

3. Erosion and sedimentation control measures shall be inspected and maintained. Construct sediment barriers across stream and channelization ditches to prevent silt laden water and spoil from flowing back into waterbody. Silt fence or sandbags may be used interchangeably.

4. Bridge decks will be kept free of soil.

5. Equipment bridges will consist of one of the following: clean rock placed over flume pipes; prefabricated construction mats; or flexfloat or other temporary bridging such as Bailey bridges.

6. Remove equipment bridges and associated material as soon as possible. Restore and stabilize bed and banks to approximate pre-construction conditions.

7. Dispose of any rock as directed.
NOTES:
1. METHOD APPLIES TO CROSSING WHERE NO FLOWING WATER IS PRESENT AT THE TIME OF CROSSING.
2. CONTRACTOR MAY "MAINLINE THROUGH" THE CROSSING OR UP TO BOTH SIDES OF THE CROSSING; STRING, WELD, COAT, AND WEIGHT (IF NECESSARY), USING THE MAINLINE CREW WITH THE PIPE SKIDDED OVER THE CROSSING.
3. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. FOLLOWING CLEARING AND GRADING AND MAINTAIN UNTIL CONSTRUCTION OF THE CROSSING. EROSION CONTROL MEASURES SHALL BE REINSTALLED IMMEDIATELY FOLLOWING BACKFILLING OF TRENCH AND STABILIZATION OF BANKS.
4. TOPSOIL AND SPOIL WILL NOT BE STOCKPILED IN THE CROSSING CHANNEL.
5. MAINTAIN STREAM FLOW THROUGHOUT CROSSING CONSTRUCTION.
6. BACKFILL WITH NATIVE MATERIAL.
7. RESTORE CROSSING CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.
8. RESTORE CROSSING BANKS TO APPROXIMATE ORIGINAL CONDITION AND STABILIZE, AS REQUIRED.

NOTES:
1. SCHEDULE CROSSING DURING LOW FLOW PERIOD IF POSSIBLE.
2. COMPLETE ALL IN-STREAM ACTIVITIES WITHIN 24 HOURS IF FEASIBLE.
3. CONSTRUCT SEDIMENT BARRIERS ALONG THE SIDES OF STOCKPILES AND ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
4. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL AND WITHIN THE CONSTRUCTION R.O.W.
5. INSTALL SOFT PLUGS AT THE EDGE OF STREAM BANKS UNTIL JUST PRIOR TO PIPE INSTALLATION TO CONTROL WATER FLOW & TRENCH SLOUGHING, IF NEEDED.
6. MAINTAIN STREAM FLOW THROUGHOUT CROSSING CONSTRUCTION.
7. BACKFILL WITH NATIVE MATERIAL.
8. RESTORE WATERBODY CHANNELS TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.
9. RESTORE WATERBODY BANKS TO APPROXIMATE ORIGINAL CONDITION AND STABILIZE, AS REQUIRED.
10. FOLLOW REQUIREMENTS FROM THE ARMY CORPS OF ENGINEERS.
11. ALL DIMENSIONS INDICATED SHALL BE DETERMINED BY ACTUAL CONSTRUCTION CONDITIONS.
1. METHOD APPLIES TO WATERBODIES THAT ARE NOT STATE DESIGNATED FISHERIES WHERE FLUME CROSSINGS ARE NOT REQUIRED. IF TOPOGRAPHY PERMITS INSTALLATION OF A TEMPORARY EQUIPMENT BRIDGE, THE CONTRACTOR SHALL TRENCH, STRING, WELD, COAT AND WEIGHT (IF NECESSARY) THE MAINLINE CREW TRAVELING OVER THE BRIDGE. IF TOPOGRAPHY PROHIBITS INSTALLATION OF A TEMPORARY EQUIPMENT BRIDGE, CONTRACTOR SHALL TRENCH UP TO BOTH SIDES OF CROSSING; STRING, WELD, COAT AND WEIGHT (IF NECESSARY) USING THE MAINLINE CREW. IN STREAM EXCAVATION, LOWER IN, AND BACKFILL WILL UTILIZE A CLAM OR HOES WORKING FROM THE BANKS.

2. SCHEDULE CROSSING DURING LOW FLOW PERIOD IF POSSIBLE.

3. CONSTRUCT SEDIMENT BARRIERS ALONG THE SIDES OF STOCKPILES AND ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING BACK INTO WATERBODY.

4. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL.

5. INSTALL TEMPORARY (SOFT) PLUGS AT THE EDGE OF STREAM BANKS UNTIL JUST PRIOR TO PIPE INSTALLATION TO CONTROL WATER FLOW & TRENCH SLOUGHING.

6. TRENCH THROUGH WATERBODY USING MAINLINE EXCAVATION EQUIPMENT WHERE PRACTICAL.

7. MAINTAIN STREAM FLOW THROUGHOUT CROSSING CONSTRUCTION.

8. RESTORE WATERBODY CHANNEL TO APPROXIMATE PRE-CONSTRUCTION PROFILE AND SUBSTRATE.

9. RESTORE STREAM BANKS TO APPROPRIATE ORIGINAL CONDITION AND STABILIZE, AS REQUIRED.
NOTES:
1. THIS METHOD APPLIES TO SWALES, DRAINS, SMALL STREAMS OR CREEKS WITH LIMITED FLOW AT TIME OF CONSTRUCTION WHERE DOWNSTREAM SILLTATION MUST BE AVOIDED AND THE CROSSING WIDTH IS NOT PROHIBITIVE.
2. SCHEDULE CROSSING DURING LOW FLOW PERIOD IF POSSIBLE.
3. COMPLETE ALL IN-STREAM ACTIVITIES AS EXPEDITIOUSLY AS POSSIBLE.
4. INSTALL TEMPORARY VEHICLE CROSSING, IF REQUIRED.
5. IN-STREAM SPOIL TO BE STORED OUT OF THE STREAM CHANNEL AND WITHIN THE CONSTRUCTION R.O.W. UNLESS DEPICTED OTHERWISE IN THE SITE SPECIFIC CROSSING PLANS.
6. CONSTRUCT SEDIMENT BARRIERS TO PREVENT SILT LADEN WATER AND SPOIL FROM FLOWING INTO WATERBODY. CONSTRUCTED SEDIMENT BARRIERS SHALL EXTEND ALONG THE SIDES OF THE SPOIL AND TOPSOIL STOCKPILES AND ACROSS THE ENTIRE CONSTRUCTION R.O.W. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY.
7. CONSTRUCT UPSTREAM STRUCTURE (DAM) FOLLOWED BY DOWNSTREAM STRUCTURE (DAM). WATER STRUCTURES' FINAL LOCATION WILL BE APPROVED BY THE COMPANY INSPECTOR.
8. SIZE PUMPS FOR DIVERSION OF ENTIRE STREAM FLOW. CONTRACTOR SHALL MAINTAIN 100% SPARE PUMPING CAPACITY ON SITE. PUMPS SHALL BE INSTALLED ON POLYETHYLENE BARRIERS FOR FUEL/OIL SPILL CONTAINMENT. PUMP INTAKES WILL BE SCREENED TO PREVENT ENTRAPMENT OF FISH. CONTRACTOR SHALL MONITOR PUMPS AND WATERS STRUCTURES ON A 24 HOUR BASIS UNTIL THE CROSSING INSTALLATION IS COMPLETE. SHOULD LEAKAGE AT THE DAM STRUCTURES OCCUR, CONTRACTOR SHALL DEWATER BETWEEN THE STRUCTURES THROUGH AN APPROPRIATE FILTER AND ONTO A WELL VEGETATED UPLAND AREA.
9. LEAVE HARD PLUGS AT STREAM BANK EDGE UNTIL JUST PRIOR TO PIPE INSTALLATION.
10. COMPLETE CONSTRUCTION OF IN-STREAM PIPE SECTION. WEIGHT PIPE AS NECESSARY PRIOR TO COMMENCEMENT OF IN-STREAM ACTIVITY.
11. TRENCH THROUGH WATERBODY AS EXPEDITIOUSLY AS PRACTICAL. INSTALL TEMPORARY (SOFT) PLUGS, IF NECESSARY, TO CONTROL WATER FLOW AND TRENCH SLOUGHING.
12. MAINTAIN STREAM FLOW THROUGHOUT CROSSING CONSTRUCTION.
13. LOWER-IN PIPE, INSTALL TRENCH PLUG AND BACKFILL IMMEDIATELY.
14. RESTORE WATERBODY TO APPROXIMATE ORIGINAL CONDITION. STABILIZE WATERBODY BANKS AND INSTALL TEMPORARY BARRIERS.
NOTES:
1. NORMAL FLOW OF DRAINAGE NOT TO BE CHANGED FOLLOWING PIPELINE CONSTRUCTION OPERATIONS.
2. CONSTRUCT ALL CROSSINGS IN ACCORDANCE WITH ENVIRONMENTAL PERMIT REQUIREMENTS AND CONDITIONS.
3. PIPELINE TO BE INSTALLED BY OPEN-CUT METHOD.

TYPICAL WATERBODY CROSSING HORIZONTAL BORE PLAN AND SECTION

TYPICAL SMALL CREEK CROSSING SECTION

NOTES:
1. NORMAL FLOW OF DRAINAGE NOT TO BE CHANGED FOLLOWING PIPELINE CONSTRUCTION OPERATIONS.
2. CONSTRUCT ALL CROSSINGS IN ACCORDANCE WITH ENVIRONMENTAL PERMIT REQUIREMENTS AND CONDITIONS.
3. PIPELINE TO BE INSTALLED BY OPEN-CUT METHOD.
SLOPE BREAKER NOTES:
1. SLOPE BREAKERS SHALL BE CONSTRUCTED OF NATIVE SOIL AND INSTALLED AT LOCATIONS AS SHOWN ON THE CONSTRUCTION DRAWINGS, OR AS REQUIRED.
2. SLOPE BREAKER SHALL BE ORIENTED AS SHOWN OR OTHER PATTERN AS REQUIRED.
3. SLOPE BREAKERS SHALL BE CONSTRUCTED AT A 2-8% GRADIENT ACROSS THE SLOPE.
5. THE OUTLET OF THE SLOPE BREAKER MUST FREELY DISCHARGE ALL RUNOFF OFF THE DISTURBED R.O.W. INTO A STABLE, WELL VEGETATED AREA OR INTO AN ENERGY DISSIPATOR.
6. WHERE SLOPE BREAKERS EXTEND BEYOND THE EDGE OF THE CONSTRUCTION R.O.W. TO DIRECT RUNOFF INTO STABLE, WELL VEGETATED AREAS, THESE LOCATIONS MUST BE APPROVED.

FLOW ENERGY DISSIPATOR NOTES:
1. THE OUTLET SHALL CONTAIN AN ENERGY DISSIPATOR IF THE COMPANY DETERMINES EXISTING VEGETATION IS NOT SUFFICIENTLY STABLE TO PREVENT EROSION. THE ENERGY DISSIPATOR SHALL BE CONSTRUCTED AS FOLLOWS:
- KEY ROCK INTO WATER BAR
- PROVIDE ENOUGH AREA INSIDE "L" TO CAPTURE AND HOLD SEDIMENT.

TYPICAL SLOPE BREAKER WITH LONGITUDINAL CROSS SLOPES

FLOW:
- KEY ROCK INTO WATER BAR
- PROVIDE ENOUGH AREA INSIDE "L" TO CAPTURE AND HOLD SEDIMENT.

SILT FENCING, STABLE HAY BALES, ROCK, OR STABLE VEGETATED AREA AS AN ENERGY DISSIPATOR

TYPICAL SLOPE BREAKER WITH LONGITUDINAL CROSS SLOPES

FLOW:
- KEY ROCK INTO WATER BAR
- PROVIDE ENOUGH AREA INSIDE "L" TO CAPTURE AND HOLD SEDIMENT.

SILT FENCING, STABLE HAY BALES, ROCK, OR STABLE VEGETATED AREA AS AN ENERGY DISSIPATOR

TYPICAL SLOPE BREAKER WITH LONGITUDINAL CROSS SLOPES

FLOW:
- KEY ROCK INTO WATER BAR
- PROVIDE ENOUGH AREA INSIDE "L" TO CAPTURE AND HOLD SEDIMENT.

SILT FENCING, STABLE HAY BALES, ROCK, OR STABLE VEGETATED AREA AS AN ENERGY DISSIPATOR

TYPICAL SLOPE BREAKER WITH LONGITUDINAL CROSS SLOPES

FLOW:
- KEY ROCK INTO WATER BAR
- PROVIDE ENOUGH AREA INSIDE "L" TO CAPTURE AND HOLD SEDIMENT.
NOTES:
1. MINI TRENCH BREAKERS SHALL BE INSTALLED AT EDGE OF EACH WETLAND.
2. OPEN WEAVE HEMP OR JUTE SACKS SHALL BE FILLED WITH A MINIMUM OF 55lbs. OF SAND OR SUBSOIL.
3. BREAKER CONFIGURATION MAY BE CHANGED TO INCLUDE KEYING AS DETERMINED BY COMPANY ENGINEER.

NOTES:
1. TRENCH BREAKERS SHALL BE INSTALLED:
   - ON SLOPES ALONG THE TRENCH LINE WHERE THE NATURAL DRAINAGE PATTERN, PROFILE, AND TYPE OF BACKFILL MATERIAL MAY RESULT IN LOSS OF BACKFILL MATERIAL OR ALTERATION OF THE NATURAL PATTERN
   - AT THE BASE OF SLOPES ADJACENT TO WATERBODIES AND WETLANDS
   - WHERE NEEDED TO AVOID DRAINING A WETLAND
2. OPEN WEAVE HEMP OR JUTE SACKS SHALL BE FILLED WITH A MINIMUM OF 55lbs IN A MIXTURE OF SAND & SUBSOIL.
3. BREAKER SPACING AND CONFIGURATION, INCLUDING THE NEED TO KEY THE BREAKER INTO THE UNDISTURBED SOIL AT THE SIDES AND BOTTOM OF THE TRENCH, MAY CHANGE AS DETERMINED BY COMPANY ENGINEER.
NOTES:
1. MARKERS SHALL BE PLACED DIRECTLY OVER THE PIPELINE WHEN THERE IS AT LEAST 1'-0" OF CLEARANCE BETWEEN THE TOP OF THE PIPE AND THE BOTTOM OF THE MARKER. MARKERS SHALL BE SLIGHTLY OFFSET IF THE CLEARANCE IS LESS THAN 1'-0". MARKERS WILL BE OFFSET IF THE PIPELINE IS IN A ROADWAY.

2. PIPE AND THE BOTTOM OF THE MARKER. MARKERS WILL BE OFFSET IF THE PIPELINE IS IN A ROADWAY.

NOTES:
1. CONTRACTOR TO ASSEMBLE SIGN AND MOUNT ON POST.
2. REFLECTIVE STRIPING SHOULD BE ADDED ON ALL SIDES OF POST.
1. ALL WIRE SHALL BE INSULATED STRANDED COPPER #12 THHN AS SHOWN ABOVE.
2. TERMINAL BLOCK SHALL BE WIRED BY CONTRACTOR AS SHOWN IN TERMINAL DETAIL ABOVE.
3. ALL WIRE CONNECTIONS TO CARRIER PIPE SHALL BE MADE AS SHOWN IN DETAIL ABOVE. WIRE SHALL BE CONNECTED TO PIPE BY CADWELD PROCESS WITH COPPER HEAT SLEEVE.
4. CADWELD WIRE CONNECTIONS SHALL BE PRIMED WITH ROYSTON SPRAY PRIMER OR EQUAL AND ALLOWED TO DRY 3 TO 4 MINUTES OR UNTIL TACKY, AND COVERED WITH ROYSTON HANDY CAP OR EQUAL.
5. WIRE INSULATION SHALL BE PROTECTED FROM DAMAGE.
6. LAY WIRES ALONGSIDE PIPE. NOT OVER OR UNDER PIPE.
7. CATHODIC PROTECTION TEST STATION AND ALL OTHER MATERIALS SHALL BE FURNISHED BY CONTRACTOR.
8. INSTALL AT ALL LOCATIONS INDICATED ON ALIGNMENT SHEETS.

NOTES:

1. ALL WIRES TO MAKE A COMPLETE LOOP AROUND PIPE.
2. TERMINAL BLOCK SHALL BE WIRED BY CONTRACTOR AS SHOWN IN TERMINAL DETAIL ABOVE.
3. ALL WIRE CONNECTIONS TO CARRIER PIPE SHALL BE MADE AS SHOWN IN DETAIL ABOVE. WIRE SHALL BE CONNECTED TO PIPE BY CADWELD PROCESS WITH COPPER HEAT SLEEVE.
4. CADWELD WIRE CONNECTIONS SHALL BE PRIMED WITH ROYSTON SPRAY PRIMER OR EQUAL AND ALLOWED TO DRY 3 TO 4 MINUTES OR UNTIL TACKY, AND COVERED WITH ROYSTON HANDY CAP OR EQUAL.
5. WIRE INSULATION SHALL BE PROTECTED FROM DAMAGE.
6. LAY WIRES ALONGSIDE PIPE. NOT OVER OR UNDER PIPE.
7. CATHODIC PROTECTION TEST STATION AND ALL OTHER MATERIALS SHALL BE FURNISHED BY CONTRACTOR.
8. INSTALL AT ALL LOCATIONS INDICATED ON ALIGNMENT SHEETS.

NOTES:

1. ALL WIRES TO MAKE A COMPLETE LOOP AROUND PIPE.
2. TERMINAL BLOCK SHALL BE WIRED BY CONTRACTOR AS SHOWN IN TERMINAL DETAIL ABOVE.
3. ALL WIRE CONNECTIONS TO CARRIER PIPE SHALL BE MADE AS SHOWN IN DETAIL ABOVE. WIRE SHALL BE CONNECTED TO PIPE BY CADWELD PROCESS WITH COPPER HEAT SLEEVE.
4. CADWELD WIRE CONNECTIONS SHALL BE PRIMED WITH ROYSTON SPRAY PRIMER OR EQUAL AND ALLOWED TO DRY 3 TO 4 MINUTES OR UNTIL TACKY, AND COVERED WITH ROYSTON HANDY CAP OR EQUAL.
5. WIRE INSULATION SHALL BE PROTECTED FROM DAMAGE.
6. LAY WIRES ALONGSIDE PIPE. NOT OVER OR UNDER PIPE.
7. CATHODIC PROTECTION TEST STATION AND ALL OTHER MATERIALS SHALL BE FURNISHED BY CONTRACTOR.
8. INSTALL AT ALL LOCATIONS INDICATED ON ALIGNMENT SHEETS.
NOTES:

1. REFERENCE DRAWING (DONLIN PIPELINE MLV DWG) AND CONSTRUCTION SPECIFICATIONS FOR DETAILED CONSTRUCTION GUIDELINES.
2. LOCATION OF GATE TO BE FIELD DETERMINED.
PRELIMINARY
NOT FOR CONSTRUCTION!
PRELIMINARY
NOT FOR CONSTRUCTION!

DODGE 350 MEGA CAB PICK-UP

MEGA CAB
PICK-UP

SKIDS

SEGREGATED ORGANIC SPOIL PILE

NODWELL 240 FUEL TANKER/WATER TANKER

NODWELL 240 LUBE & OIL (MOBILE)

CAT 561N PIPELAYER

TOP OF TRENCH LENGTH 30 FT; WIDTH 5 FT

EDGE OF OPEN TRENCH - BOTTOM OF OPEN TRENCH - 2' HIGH

PIECE OF TRENCH TRENCH SPOIL PILE

MAKE-UP AREA, WORKING SIDE & TRAVEL LANE 55'

ADJACENT ORGANIC SPOIL PILE

SIDE SLOPE

SIDE SLOPE

SIDE SLOPE

TRENCH SPOIL PILE

TRENCH SPOIL PILE

CONSTRUCTION RIGHT OF WAY BOUNDARY

LEGEND

NOTES:

PIPELINE/TRENCH CENTERLINE
CONSTRUCTION R.O.W. BOUNDARY
TRENCH SPOIL PILE
ORGANIC SPOIL PILE
BOTTOM OF OPEN PIPELINE TRENCH
SIDESLOPES OF OPEN TRENCH

NOTES:

1. EQUIPMENT QUANTITY AND TYPE MAY VARY.

CAT 561N PIPELAYER

NODWELL 240 240 FUEL TANKER/WATER TANKER

NODWELL 240 LUBE & OIL (MOBILE)

DODGE 350 MEGA CAB PICK-UP

CONSTRUCTION RIGHT OF WAY BOUNDARY
PRELIMINARY
NOT FOR CONSTRUCTION!

ASSOCIATED ENGINEERING DRAWINGS
DONLIN GOLD PROJECT
APPLICANT: Donlin Gold, LLC
4700 Business Park Blvd., Suite G-25
Anchorage, Alaska 99503
AS SHOWN
RIGHT OF WAY PLAN SUMMER WETLANDS R.O.W. MODE
DATE: 9/21/2015
SCALE: 1:200
FILE NO.: PA-162T
WHY: POA-1995-120

NOTES:
1. MATS OR CORDUROY TIMBER AS NEEDED.
2. EQUIPMENT QUANTITY AND TYPE MAY VARY.

1/2" STEEL PIPE
SIDE SLOPE
SIDE SLOPE
SIDE SLOPE

CAT 561N PIPELAYER
NODWELL 240 FUEL TANKER/WATER TANKER
NODWELL 240 LUBE & OIL
DODGE 3500 MEGA CAB PICK-UP

AS NEEDED
PASSING LANE (MOVES WITH CONSTRUCTION)

4' X 16' SWAMP MATS (TYP.)

SIDE SLOPE
SIDE SLOPE
SIDE SLOPE

LEGEND
PIPELINE/TRENCH CENTERLINE
CONSTRUCTION R.O.W. BOUNDARY
TRENCH SPOIL PILE
ORGANIC SPOIL PILE
BOTTOM OF OPEN PIPELINE TRENCH
SIDESLOPES OF OPEN TRENCH

PATH: C:\Users\mlengiewicz\Dropbox\Donlin\181202_010_mapping_404_support\revision_a\PA_ROW.dwg
NOT FOR CONSTRUCTION!

PRELIMINARY

LEGEND

PERMANENT RIGHT OF WAY BOUNDARY
TEMPORARY USE AREA
CONSTRUCTION RIGHT OF WAY BOUNDARY
SNOW CLEARING STORED BETWEEN TREES

NOTES:

1. EQUIPMENT QUANTITY AND TYPE MAY VARY.
PRELIMINARY
NOT FOR CONSTRUCTION!

SEGREGATED ORGANIC SPOIL PILE
NODWELL 240 FUEL TANKER/WATER TANKER
NODWELL 240 LUBE & OIL
NODWELL 240 FUEL TANKER (MOBILE)
NODWELL 240 LUBE & OIL (MOBILE)

CONSTRUCTION RIGHT OF WAY

PIPELINE TRENCH CENTERLINE
35'
65'
25'

ORGANIC/TRENCH SPOIL
TRENCH SPOIL PILE
SIDE SLOPE
SIDE SLOPE
SIDE SLOPE

CAT 561N PIPELAYER

BOTTOM OF OPEN PIPELINE TRENCH
14"Ø STEEL PIPE

EDGE OF OPEN TRENCH
ICE PAD OR GRAVEL PAD WHERE NEEDED

CONSTRUCTION RIGHT OF WAY BOUNDARY

SNOWCAT 1644
SNOWCAT 1644

NOTES:
1. MATS OR CORDUROY TIMBER AS NEEDED.
2. EQUIPMENT QUANTITY AND TYPE MAY VARY.

Legend:
- PIPELINE/TRENCH CENTERLINE
- CONSTRUCTION R.O.W. BOUNDARY
- TRENCH SPOIL PILE
- ORGANIC SPOIL PILE
- BOTTOM OF OPEN PIPELINE TRENCH
- SIDESLOPES OF OPEN TRENCH

Notes:
- MATS OR CORDUROY TIMBER AS NEEDED.
- EQUIPMENT QUANTITY AND TYPE MAY VARY.
TRENCH SPOIL PILE

14" DIAMETER GAS PIPE

ORGANIC SPOIL PILE

ICE PAD OR GRAVEL PAD AS NEEDED.
ICE WORK PAD (12" THICK MINIMUM) WHERE WATER IS AVAILABLE, OR GRAVEL WORKPAD (12" THICK MINIMUM) WHERE WATER IS NOT AVAILABLE.

MAKE-UP AREA, WORKING SIDE & TRAVEL LANE

SEGREGATED ORGANIC SPOIL & TRENCH SPOIL

CONSTRUCTION RIGHT OF WAY

0 7.5 15 ft

PRELIMINARY
NOT FOR CONSTRUCTION!
NOT FOR CONSTRUCTION!

CONSTRUCTION RIGHT OF WAY BOUNDARY

LEGEND

- TRENCH CENTERLINE
- CONSTRUCTION R.O.W. BOUNDARY
- TRENCH SPOIL PILE
- ORGANIC SPOIL PILE
- BOTTOM OF OPEN PIPELINE TRENCH
- SIDESLOPES OF OPEN TRENCH

NOTES:
1. MATS OR CORDUROY TIMBER AS NEEDED.
2. EQUIPMENT QUANTITY AND TYPE MAY VARY.

CAT 561N PIPELAYER

NODWELL 240 FUEL TANKER

NODWELL 240 LUBE & OIL (MOBILE)

SNOWCAT

1644

CONSTRUCTION RIGHT OF WAY BOUNDARY

PRELIMINARY
PRELIMINARY
NOT FOR CONSTRUCTION!
1. Minimum depth of cover: 36". Additional cover may be required for buoyancy control, river and stream scour, and bends.

2. Excavated ditch spoil, including the ice-rich spoil, over top of the paving and allow it to thaw during summer season. Place appropriate erosion control devices (ECD) along the channel line where ice-rich spoil might flow into an existing channel. Seed the loamy soil pile and any disturbed right of way. Inspect the channel line in the spring/summer following winter construction and use low ground pressure equipment to dress up or re-shape the loamy soil pile over the ditch. As needed, re-seed and re-place ECD if necessary. Repeat inspection annually for the first three seasons or as needed to maintain soil stability.

3. Placement of select, thaw-stable fill for pipe bedding in any over-excavated sections to properly support and bed the pipe. Placement of select, thaw-stable fill around the pipe to 6" above the pipe. Acceptable ditch spoil would be preferred. Imported material might be needed if ditch spoil is not acceptable.

4. Over-excavate 3 feet below targeted ditch depth where visible segregated ice (frozen ground classification Vx) is discovered in the ditch bottom. Backfill over-excavation with thaw-stable bedding. Place geosynthetics, if so directed by the engineer, to span areas of over-excavation.