Best-In-Class Decision Tool/ Work Flow Process

WORKING DRAFT
Implementing the BIC Steep Slope Hazard Mitigation Program – Decision Tree/Work Flow Process (WFP) Outline
Revised 10-04-2016_UPDATED Feb 15, 2017

Work Flow Process (WFP) for Implementation of the BIC Program – Review and Selection of Typical Scenarios and corresponding Incremental Controls.

Refer to the project document titled "Virginia Stormwater Pollution Prevention Plan (SWPPP)", Rev 5 dated February 2017 (refer to subsequent revisions to this document, as needed) for a detailed summary and definitions for the Best in Class (BIC) program. The following offers an abbreviated summary of the program.

Typical BIC mitigation designs, i.e. Typical Designs (TDs), for any given pipeline alignment location show defined "Typical Scenarios" that describe right-of-way conditions relative to steep slope areas (i.e. planar or side slope conditions, steep slopes without evidence of instability, steep slopes with potential for instability when disturbed, ridge tops, etc.). These Typical Scenarios (there are 6 scenarios, labeled A-F) characterize the kinds of steep slope and erosion related hazards at that location and thereby support development of mitigation actions. TDs provide a comprehensive and programmatic approach to address the hundreds of BIC locations along the pipeline alignment. Each TD includes a listing of applicable Incremental Controls (i.e. individual mitigation control measures shown on fly-sheets; examples include: silt fence, erosion control cloth, slope breakers, trench breakers, surface run-off controls, subsurface drains, etc.) that can be used at that site to address a range of potential conditions. TDs include mitigation measures that go above and beyond the minimum regulatory requirements.

TDs can be further developed into a Site Specific Design (SSD) for targeted locations, or to address special site conditions. Development of a SSD requires selecting the applicable Incremental Controls listed for a TD for a given site; and then defining the location, quantity, configuration, and any other site specific information needed to support construction. SSDs typically have stand-alone drawing packages showing site specific information.

The following outlines general steps for selecting site specific Incremental Controls corresponding to a TD, or for developing a SSD. The following approach is organized as a work flow process (WFP) that describes the general steps, as follows:

1. Convene team consisting (at a minimum) of BIC representatives from Dominion Engineering, Environmental, Construction, and a representative from the contractor.

2. Identify the pipeline alignment sheet corresponding to the site location; and review ESC measures (i.e. the baseline permit requirements) shown on the alignment sheet, the defined BIC Typical Steep Slope Scenario classification (A-F) for the site (also shown on the alignment sheet), the geohazards resource report assessment (typically a separate

technical reference document), and the SSURGO soils information (indicated on alignment sheets and/or as separate data).

3. Incremental Controls are organized into similar Groups that bundle corresponding mitigation measures together, to allow for practical review and selection of the best Incremental Control for the applicable site conditions, as follows:

    a. Identify and mitigate for potential sub-surface/surface drainage issues (Group 1);

    b. Identify and mitigate for temporary ROW surface or subsurface drainage (Groups 1 and 2);

    c. Identify and mitigate for disturbed ROW backfill resulting from construction, including short- and long-term mitigation/stabilization measures (Group 2);

    d. Identify and mitigate for potential erosion of surface soils (Group 3);

    e. Identify and mitigate for stabilization of trench and ROW backfill (Group 4);

    f. Identify and mitigate for potential for surface run-off on and within the ROW (Group 5);

    g. Identify and mitigate for potential surface run-off coming onto (from outside sources), across, along, and adjacent the ROW (Group 6);

    h. Identify and mitigate for temporary erosion and sediment control issues, primarily using Silt Fence (addressed under ES&C Plan) (Group 7);

    i. Identify and mitigate for oversized backfill, bedrock trench, etc.; and shallow groundwater and buoyancy issues (Groups 8 and 9);

    j. Identify and mitigate for special considerations for construction through benched topography (Group 10);

    k. Identify and mitigate for monitoring for active/future movement during construction or long-term Operation (Group 11);

    l. Identify and mitigate for active movement through stress relief excavations (during construction short-term), over the long-term (Operations), or isolate ROW in active land movement areas (shear trench) (Group 12);

    m. Identify and mitigate for ROW layout and configuration (Group 13), use these typical layouts and geometries to plan and coordinate construction and engineering mitigation measures;

    n. Identify and mitigate for special engineering conditions through development of studies, investigations, special contractors or other specialized detailed engineering, as needed (Group 14);

o. Identify and mitigate through avoidance by excavation, HDD, deeper trench, micro-re-route, larger re-route, etc.), or develop special access (i.e. when access is limited to the temporary constructed ROW, and other permanent access needs to be developed to provide long-term access for maintenance and operation), (Group 15);

p. Identify and mitigate for karst hazards using special engineering studies and measures (Group 16).

Dominion Typical Scenarios with Typical Designs

BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 1A FRENCH DRAIN (SIMPLE)
- 1B ENHANCED DRAIN (GERMAN DRAIN), IN PIPELINE TRENCH
- 1C TARGETED SEEP DRAINS, AT INTERSEPTED SEEPS
- 1F ARMORED CHANNEL WITH DRAIN PIPE
- 1H STEEP CONVEYANCE CHANNEL
- 1I CHANGED SEEP CHARACTERISTICS
- 1K ENERGY DISSIPATION BASIN
- 2A GRADING TEMPORARY ROW SURFACE
- 2C COMPACT BACKFILL
- 2D DRY SOILS AND BACKFILL
- 2E REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL
- 2F ROCK BACKFILL
- 2G GRADING TO MATCH EXISTING CONTOURS
- 2J SPOILS MANAGEMENT
- 2O BENCH AND REGRADE WITH BACKFILL
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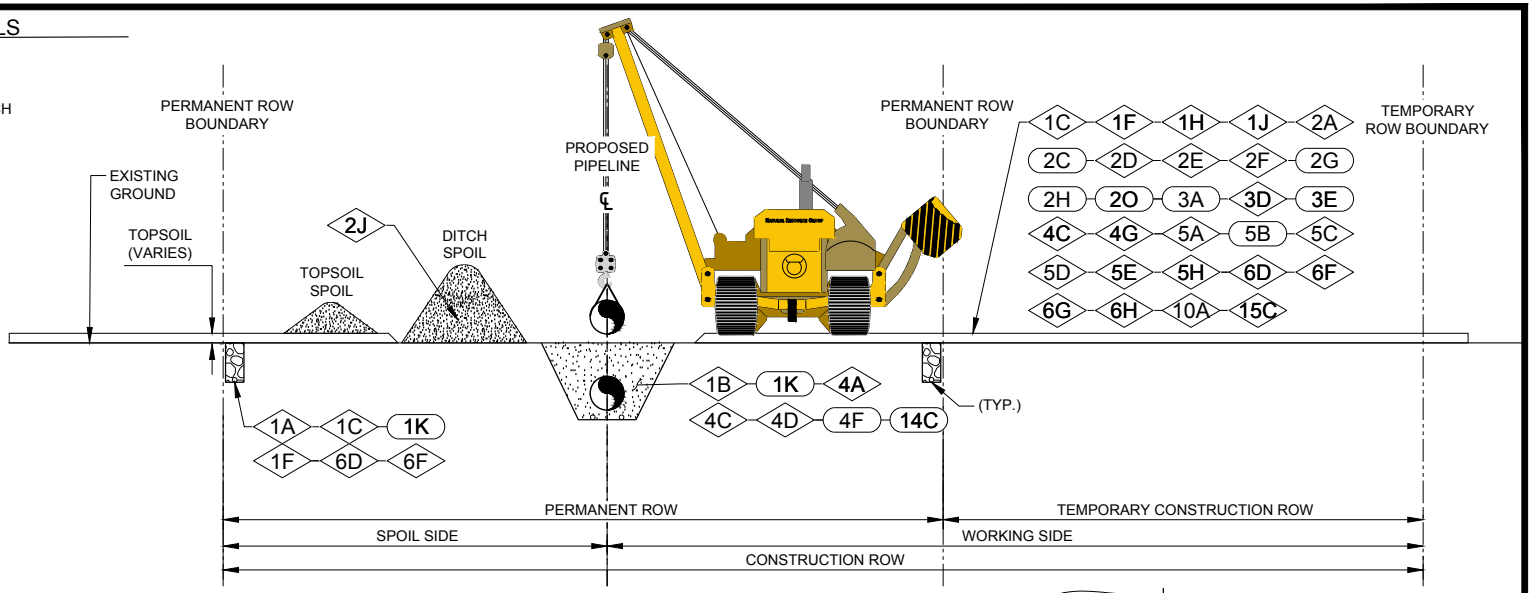
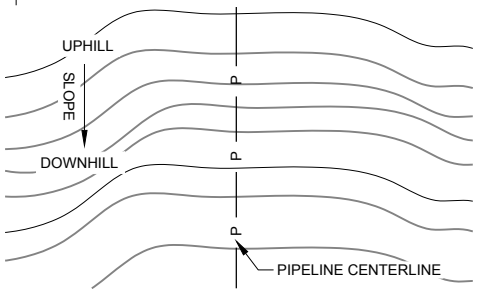
- 3D ROCK ARMORING ON DISTURBED SLOPES
- 3E COIR LOGS ON DISTURBED SLOPES
- 4A TRENCH BREAKERS (FOAM AND SANDBAGS), MODIFIED SPACING
- 4C SACK-CRETE BREAKERS (STRUCTURAL BREAKER)
- 4D SLEEVE INTERFACE BETWEEN PIPELINE AND BREAKER
- 4F TRENCH BREAKER WITH DRAINAGE
- 4G SACK-CRETE ARMOR WITH BREAKERS
- 4H FLOWABLE FILL FOR TRENCH BACKFILL
- 5A SLOPE BREAKERS (TEMP AND PERMANENT), MODIFIED SPACING
- 5B SLOPE BREAKER ARMORED OUTLET
- 5C SLOPE BREAKERS WITH DIVERSION CHANNELS
- 5D ACCESS ROADS
- 5E TEMPORARY SLOPE BREAKER WITH DRAIN PIPE
- 5G NO WOOD CHIPS IN ROW
- 5H SURFACE WATER DIVERSIONS
- 6D ARMORED CHANNEL
- 6F RIPRAP GRADATIONS
- 6G ARMORED V-SHAPED AND U-SHAPED CHANNELS
- 6H TYP SURFACE WATER CONTROL LAYOUT
- 10A BENCH RE-CONSTRUCTION THROUGH NATURAL STEPS
- 11F AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS
- 14C BLASTING PLAN(S)
- 15C ACCESS TO REMOTE ROW LOCATIONS





PLANAR SLOPE ORIENTATION (N.T.S.)

NOTES

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.
3. EXAMPLE SECTION SHOWS A TYPICAL SCENARIO. ACTUAL CUT/FILL CONDITIONS MAY VARY FOR EACH SITE.

LEGEND

- XX SCHEDULE A
- XX SCHEDULE B

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
1	2017-02-28	FINAL	DBC	THR	-	AQK

NOTES

PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

A1 – STEEP SLOPES WITHOUT EVIDENCE OF PREVIOUS MOVEMENT (PLANAR SLOPE)

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios1
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	
CHECK	-	2017-02-28		1 OF 2
REVIEW	AQK	2017-02-28		

BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 1A FRENCH DRAIN (SIMPLE)
- 1B ENHANCED DRAIN (GERMAN DRAIN)
- 1C TARGETED SEEP DRAINS
- 1D BLEEDER DRAIN
- 1F ARMORED CHANNEL WITH DRAIN PIPE
- 1H STEEP CONVEYANCE CHANNEL
- 1I CHANGED SEEP CHARACTERISTICS
- 1J SINGLE TARGETED SEEP COLLECTOR
- 1K ENERGY DISSIPATION BASIN
- 2A GRADING TEMPORARY ROW SURFACE
- 2B GRADING TRENCH WITH OUTBOARD WEDGE
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- 2E REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL
- 2F ROCK BACKFILL
- 2G GRADING TO MATCH EXISTING CONTOURS
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- 2J SPOILS MANAGEMENT
- 2O BENCH AND REGRADE WITH BACKFILL
- 2P CUT AND FILL CONSTRUCTION
- 2Q TYP SIDE HILL CUT AND FILL
- 2R TYP FILL WITH ROCK UNDER DRAIN
- 2S TYP BENCH AND REGRADE BACKFILL WITH ROCK OR SACKCRETE KEYS
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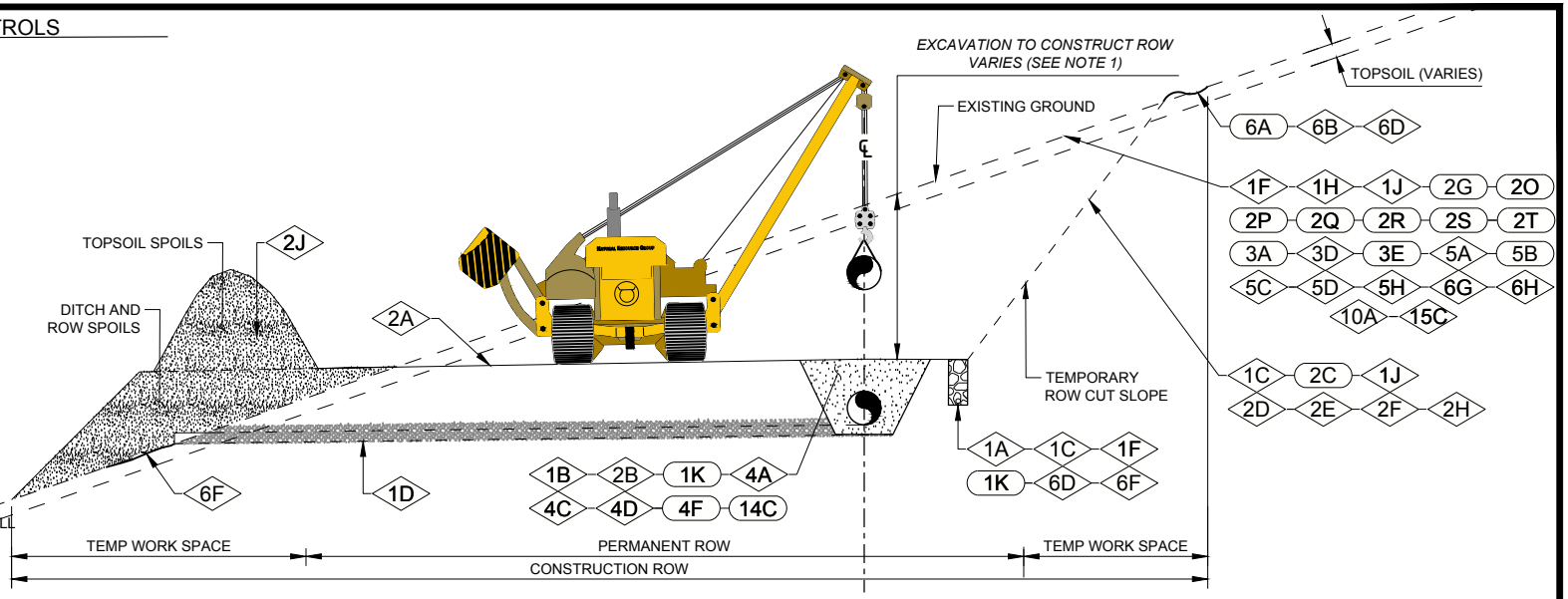
- 5D ACCESS ROADS
- 5E TEMPORARY SLOPE BREAKER WITH DRAIN PIPE
- 5G NO WOOD CHIPS IN ROW



BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 5H SURFACE WATER DIVERSIONS
- 6A COIR-LINED VEGETATED DIVERSION CHANNEL
- 6B BROW DITCH
- 6D ARMORED CHANNEL
- 6F RIPRAP GRADATIONS
- 6G ARMORED V-SHAPED AND U-SHAPED CHANNELS
- 6H TYP SURFACE WATER CONTROL LAYOUT
- 10A BENCH RE-CONSTRUCTION THROUGH NATURAL STEPS
- 11F AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS
- 14C BLASTING PLAN(S)
- 15C ACCESS TO REMOTE ROW LOCATIONS

NOTES

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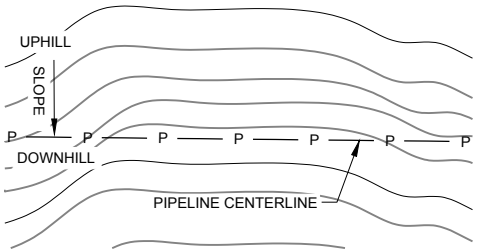

SIDESLOPE ORIENTATION (N.T.S.)

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
A	2017-02-28	FINAL	DBC	THR	-	AQK

NOTES

PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

A2 - STEEP SLOPES WITHOUT EVIDENCE OF PREVIOUS MOVEMENT (SIDESLOPE)

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios1
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	
CHECK	-	2017-02-28		2 OF 2
REVIEW	AQK	2017-02-28		

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- 1J SINGLE TARGETED SEEP COLLECTOR
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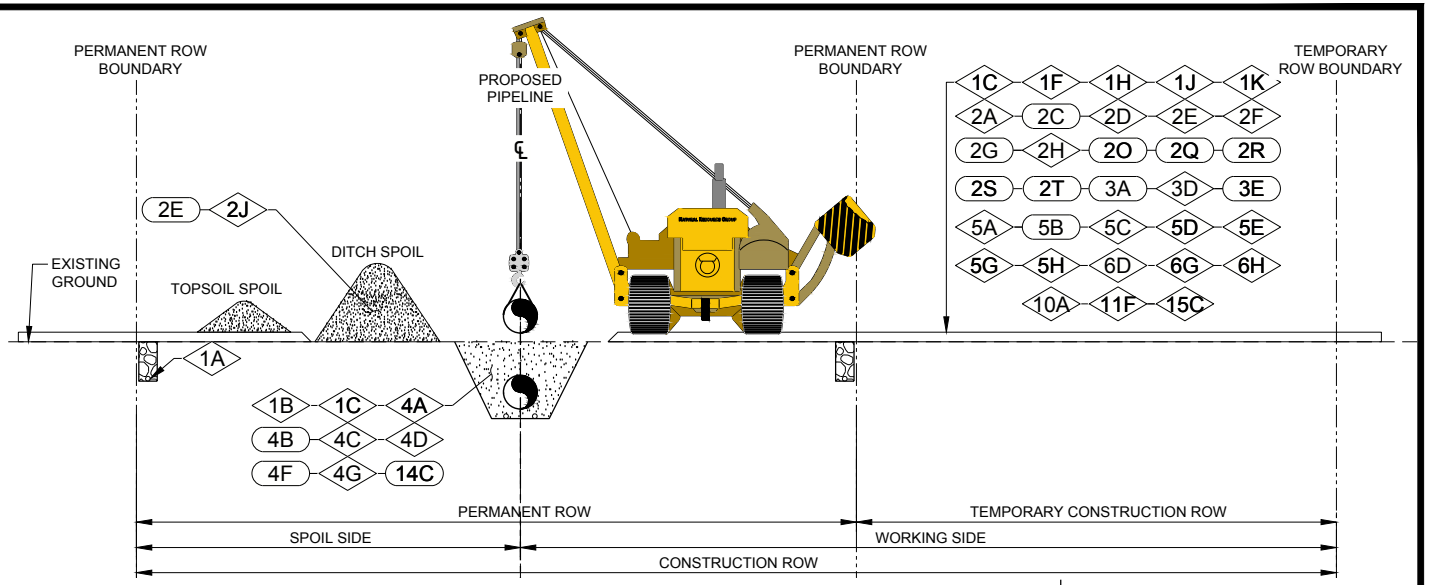

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- 10A BENCH RE-CONSTRUCTION THROUGH NATURAL STEPS,
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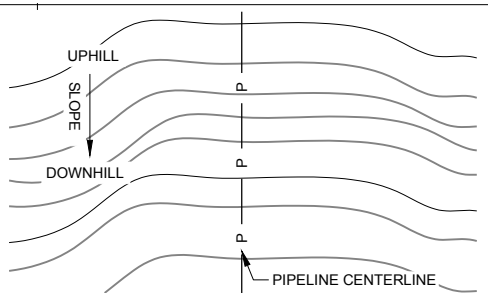

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PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

B1 - STEEP SLOPES WITH EVIDENCE OF ACTIVE MOVEMENT (PLANAR SLOPE)

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios2
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	
CHECK	-	2017-02-28		1 OF 2
REVIEW	AQK	2017-02-28		

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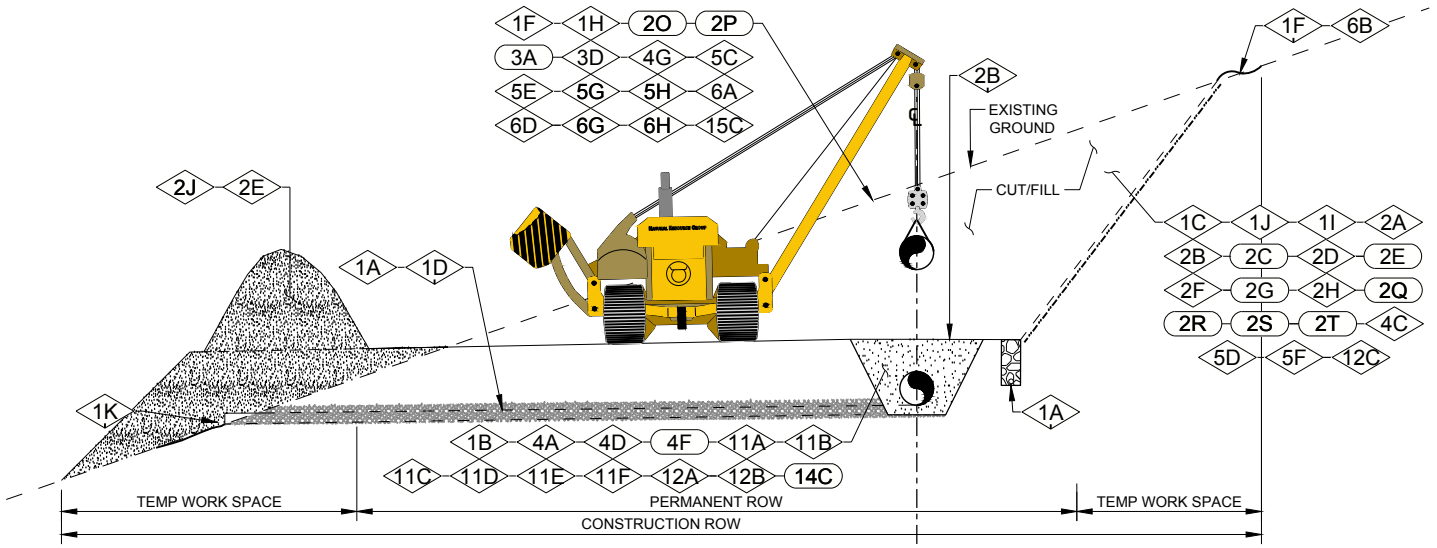

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- 6A COIR-LINED VEGETATED DIVERSION CHANNEL
- 6B BROW DITCH
- 6D ARMORED CHANNEL
- 6G ARMORED V-SHAPED AND U-SHAPED CHANNELS
- 6H TYP SURFACE WATER CONTROL LAYOUT
- 11A GEODETIC MONITORING
- 11B STRAIN GAUGE MONITORING
- 11C SLOPE INCLINOMETER MONITORING
- 11D SLOPE INCLINOMETER CASING
- 11E STANDPIPE PIEZOMETER MONITORING
- 11F AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS
- 12A STRESS RELIEF EXCAVATIONS
- 12B SELECT (DEFORMABLE) TRENCH BACKFILL
- 12C SHEAR TRENCH
- 14C BLASTING PLAN(S)
- 15C ACCESS TO REMOTE ROW LOCATIONS

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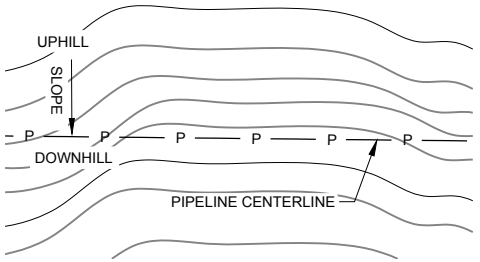

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PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

B2 - STEEP SLOPES WITH EVIDENCE OF ACTIVE MOVEMENT (SIDESLOPE)

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios3
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	
CHECK	-	2017-02-28		2 OF 2
REVIEW	AQK	2017-02-28		

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- 2G GRADING TO MATCH EXISTING CONTOURS
- 2H GRADING TO MINIMIZE BACKFILL
- 2J SPOILS MANAGEMENT
- 2L SOIL-NAIL WITH TECCO MESH
- 2M EXTERNALLY STABILIZED RETAINING WALL SYSTEMS
- 2N GEOTEXTILE REINFORCED SYSTEMS
- 2O BENCH AND REGRADE WITH BACKFILL
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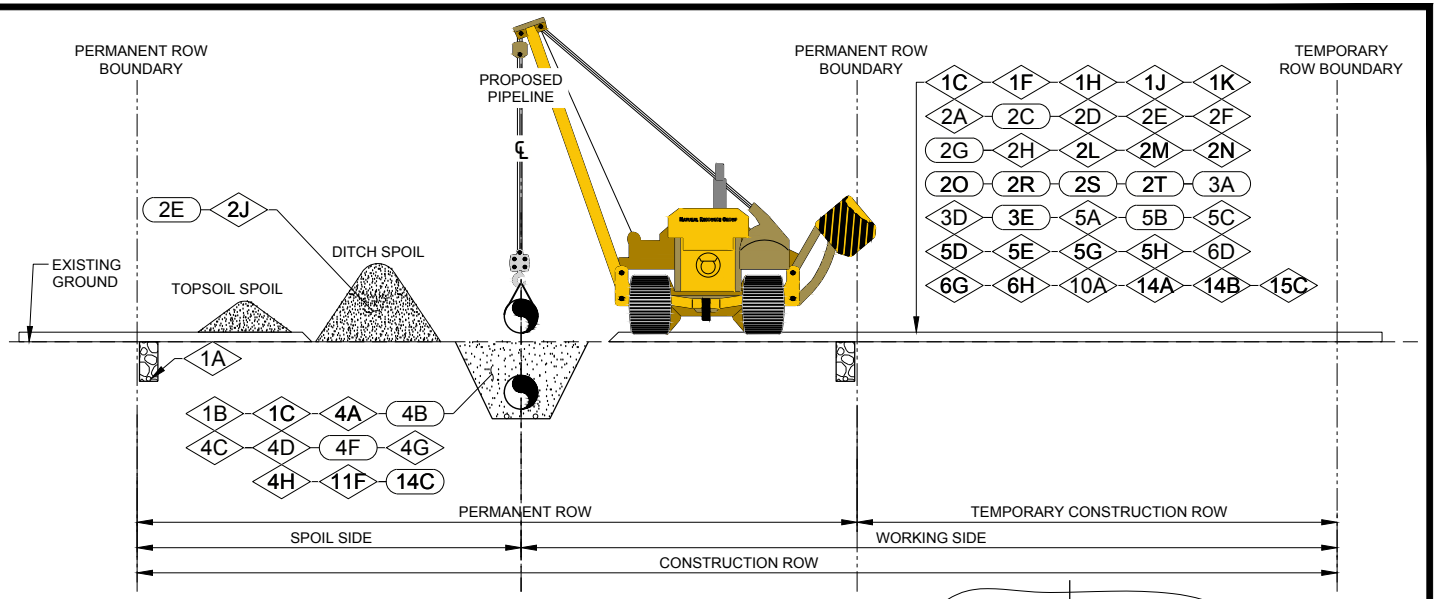
- 5G NO WOOD CHIPS IN ROW
- 5H SURFACE WATER DIVERSIONS



BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 6D ARMORED CHANNEL
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- 6H TYP SURFACE WATER CONTROL LAYOUT
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- 14B MESH ROCK FALL PROTECTION
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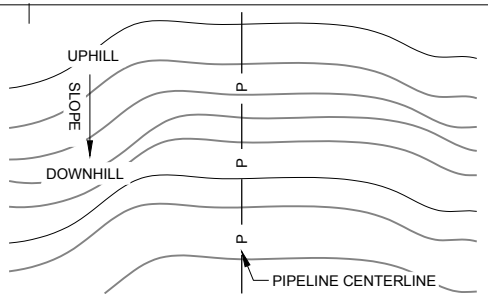


PLANAR SLOPE ORIENTATION (N.T.S.)

NOTES

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.
3. EXAMPLE SECTION SHOWS A TYPICAL SCENARIO. ACTUAL CUT/FILL CONDITIONS MAY VARY FOR EACH SITE.

LEGEND

- XX SCHEDULE A
- XX SCHEDULE B

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
A	2017-02-28	FINAL	DBC	THR	-	AQK

NOTES

PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

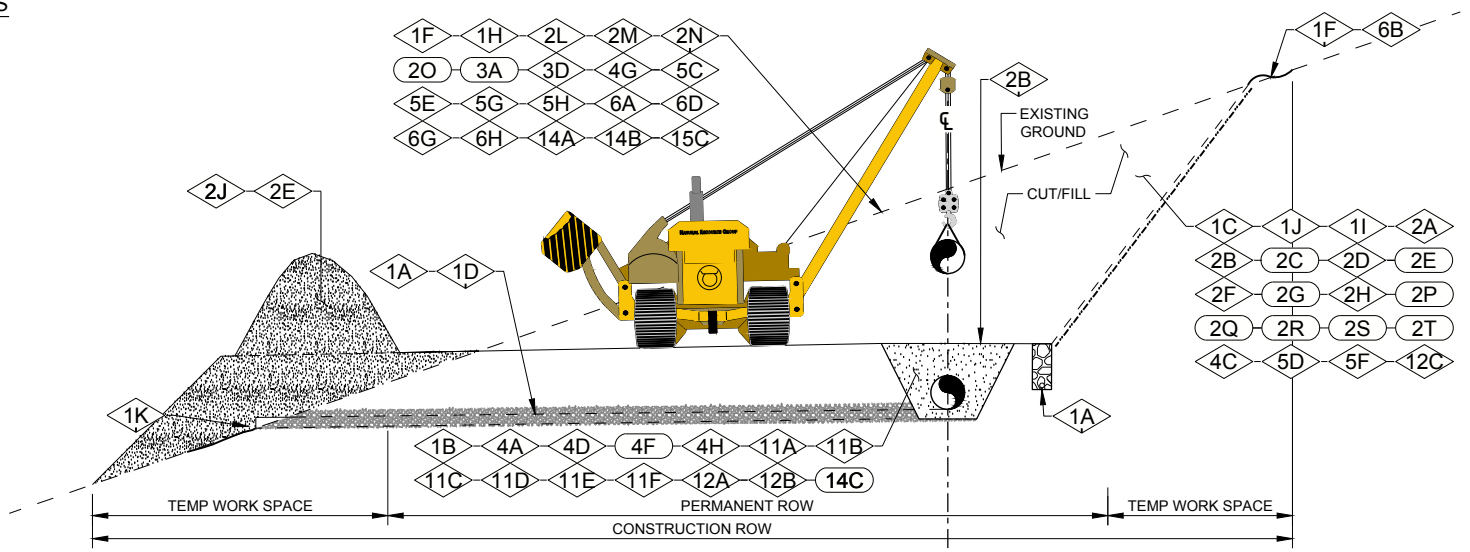
C1 – STEEP SLOPES WITH INCREASED POTENTIAL FOR INSTABILITY WHEN DISTURBED (PLANAR SLOPE)

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios2
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	
CHECK	-	2017-02-28		1 OF 2
REVIEW	AQK	2017-02-28		

BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 1A FRENCH DRAIN (SIMPLE)
- 1B ENHANCED DRAIN (GERMAN DRAIN)
- 1C TARGETED SEEP DRAINS
- 1D BLEEDER DRAIN
- 1F ARMORED CHANNEL WITH DRAIN PIPE
- 1H STEEP CONVEYANCE CHANNEL
- 1I CHANGED SEEP CHARACTERISTICS
- 1J SINGLE TARGETED SEEP COLLECTOR
- 1K ENERGY DISSIPATION BASIN
- 2A GRADING TEMPORARY ROW SURFACE
- 2B GRADING TRENCH WITH OUTBOARD WEDGE
- 2C COMPACT BACKFILL
- 2D DRY SOILS AND BACKFILL
- 2E REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL
- 2F ROCK BACKFILL
- 2G GRADING TO MATCH EXISTING CONTOURS
- 2H GRADING TO MINIMIZE BACKFILL
- 2J SPOILS MANAGEMENT
- 2L SOIL-NAIL WITH TECCO MESH
- 2M EXTERNALLY STABILIZED RETAINING WALL SYSTEMS
- 2N GEOTEXTILE REINFORCED SYSTEMS
- 2O BENCH AND REGRADE WITH BACKFILL
- 2P CUT AND FILL CONSTRUCTION
- 2Q TYP SIDE HILL CUT AND FILL
- 2R TYP FILL WITH ROCK UNDER DRAIN
- 2S TYP BENCH AND REGRADE BACKFILL WITH ROCK OR SACKCRETE KEYS
- 2T TYP FILL WITH MULTIPLE ROCK CHANNELS
- 3A TRACK DISTURBED SLOPES
- 3D ROCK ARMORING ON DISTURBED SLOPES
- 3E COIR LOGS ON DISTURBED SLOPES
- 4A TRENCH BREAKERS (FOAM AND SANDBAGS), MODIFIED SPACING
- 4B TRENCH DAMS (FOAM BAGS OR FINE GRAINED SOILS)
- 4C SACK-CRETE BREAKERS (STRUCTURAL BREAKER)
- 4D SLEEVE INTERFACE BETWEEN PIPELINE AND BREAKER
- 4F TRENCH BREAKER WITH DRAINAGE
- 4G SACK-CRETE ARMOR WITH BREAKERS
- 4H FLOWABLE FILL FOR TRENCH BACKFILL
- 5A SLOPE BREAKERS (TEMP AND PERMANENT), MODIFIED SPACING
- 5C SLOPE BREAKERS WITH DIVERSION CHANNELS



BEST IN CLASS (BIC) INCREMENTAL CONTROLS

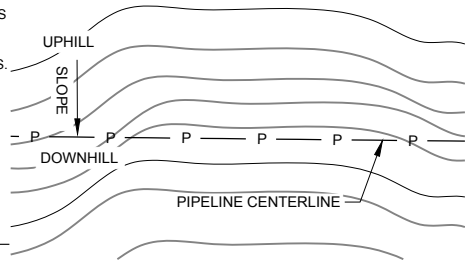
- 5D ACCESS ROADS
- 5E TEMPORARY SLOPE BREAKER WITH DRAIN PIPE
- 5F SACK-CRETE WEDGE
- 5G NO WOOD CHIPS IN ROW
- 5H SURFACE WATER DIVERSIONS
- 6A COIR-LINED VEGETATED DIVERSION CHANNEL
- 6B BROW DITCH
- 6D ARMORED CHANNEL
- 6G ARMORED V-SHAPED AND U-SHAPED CHANNELS
- 6H TYP SURFACE WATER CONTROL LAYOUT
- 11A GEODETIC MONITORING
- 11B STRAIN GAUGE MONITORING
- 11C SLOPE INCLINOMETER MONITORING
- 11D SLOPE INCLINOMETER CASING
- 11E STANDPIPE PIEZOMETER MONITORING
- 11F AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS
- 12A STRESS RELIEF EXCAVATIONS
- 12B SELECT (DEFORMABLE) TRENCH BACKFILL
- 12C SHEAR TRENCH
- 14A SITE SPECIFIC DETAILED ENGINEERING
- 14B MESH ROCK FALL PROTECTION
- 14C BLASTING PLAN(S)
- 15C ACCESS TO REMOTE ROW LOCATIONS

NOTES

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.
3. EXAMPLE SECTION SHOWS A TYPICAL SCENARIO. ACTUAL CUT/FILL CONDITIONS MAY VARY FOR EACH SITE.

LEGEND

- XX SCHEDULE A
- XX SCHEDULE B



SIDESLOPE ORIENTATION (N.T.S.)

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
1	2017-02-28	FINAL	DBC	THR	-	AQK

NOTES

PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

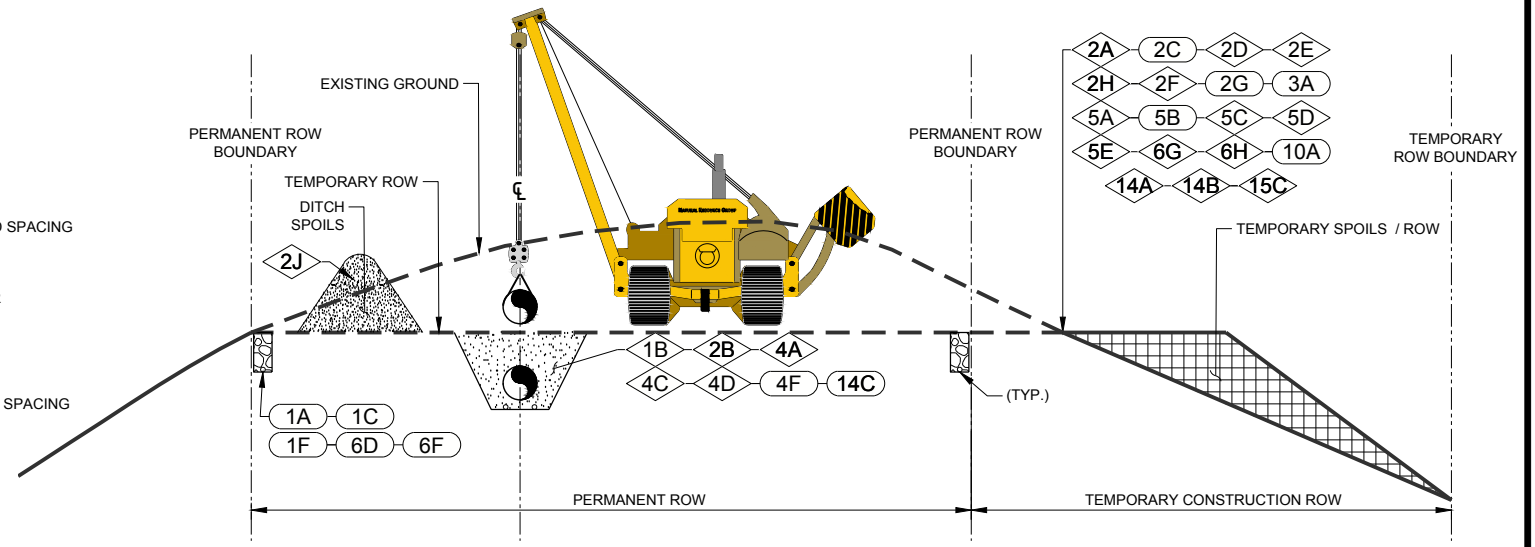
C2 – STEEP SLOPES WITH INCREASED POTENTIAL FOR INSTABILITY WHEN DISTURBED (SIDE SLOPE)

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios3
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	2 OF 2
CHECK	-	2017-02-28		
REVIEW	AQK	2017-02-28		

BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 1B ENHANCED DRAIN (GERMAN DRAIN)
- 2A GRADING TEMPORARY ROW SURFACE
- 2B GRADING TRENCH WITH OUTBOARD WEDGE
- 2C COMPACT BACKFILL
- 2D DRY SOILS AND BACKFILL
- 2E REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL
- 2F ROCK BACKFILL
- 2G GRADING TO MATCH EXISTING CONTOURS
- 2H GRADING TO MINIMIZE BACKFILL
- 2J SPOILS MANAGEMENT
- 3A TRACK DISTURBED SLOPES
- 4A TRENCH BREAKERS (FOAM AND SANDBAGS), MODIFIED SPACING
- 4C SACK-CRETE BREAKERS (STRUCTURAL BREAKER)
- 4D SLEEVE INTERFACE BETWEEN PIPELINE AND BREAKER
- 4F TRENCH BREAKER WITH DRAINAGE
- 4H FLOWABLE FILL FOR TRENCH BACKFILL
- 5A SLOPE BREAKERS (TEMP AND PERMANENT), MODIFIED SPACING
- 5B SLOPE BREAKER ARMORED OUTLET
- 5C SLOPE BREAKERS WITH DIVERSION CHANNELS
- 5D ACCESS ROADS
- 5E TEMPORARY SLOPE BREAKER WITH DRAIN PIPE
- 5G NO WOOD CHIPS IN ROW
- 6G ARMORED V-SHAPED AND U-SHAPED CHANNELS
- 6H TYP SURFACE WATER CONTROL LAYOUT
- 10A BENCH RE-CONSTRUCTION THROUGH NATURAL STEPS
- 11F AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS
- 14A SITE SPECIFIC DETAILED ENGINEERING
- 14B MESH ROCK FALL PROTECTION
- 14C BLASTING PLAN(S)
- 15C ACCESS TO REMOTE ROW LOCATIONS



NOTES

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.
3. SCENARIO SHOWN WHERE RIDGE TOP IS GENERALLY CENTERED, BUT MAY VARY WITH CUT/FILL TO ONE SIDE OR THE OTHER.

LEGEND

- XX SCHEDULE A
- XX SCHEDULE B

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
A	2017-02-28	FINAL	DBC	THR	-	AQK

NOTES

PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

D - STEEP SLOPES NEAR NARROW RIDGE TOPS

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios1
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	
CHECK	-	2017-02-28		1 OF 1
REVIEW	AQK	2017-02-28		

BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 1A FRENCH DRAIN (SIMPLE)
- 1B ENHANCED DRAIN (GERMAN DRAIN), IN PIPELINE TRENCH
- 1C TARGETED SEEP DRAINS, AT INTERSEPTED SEEPS
- 1D BLEEDER DRAIN
- 1F ARMORED CHANNEL WITH DRAIN PIPE
- 1G DEWATERING
- 1H STEEP CONVEYANCE CHANNEL
- 1I CHANGED SEEP CHARACTERISTICS
- 1J SINGLE TARGETED SEEP COLLECTOR
- 1K ENERGY DISSIPATION BASIN
- 1L DEWATERING DISCHARGE BAG
- 1M DEWATERING DISCHARGE IN UPLAND AREA
- 2A GRADING TEMPORARY ROW SURFACE
- 2C COMPACT BACKFILL
- 2D DRY SOILS AND BACKFILL
- 2E REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL
- 2F ROCK BACKFILL
- 2G GRADING TO MATCH EXISTING CONTOURS
- 2J SPOILS MANAGEMENT
- 2K GABIONS
- 2L SOIL-NAIL WITH TECCO MESH
- 2M EXTERNALLY STABILIZED RETAINING WALL SYSTEMS
- 2N GEOTEXTILE REINFORCED SYSTEMS
- 2O BENCH AND REGRADE WITH BACKFILL
- 2P CUT AND FILL CONSTRUCTION
- 2Q TYP SIDE HILL CUT AND FILL
- 2R TYP FILL WITH ROCK UNDER DRAIN
- 2S TYP BENCH AND REGRADE BACKFILL WITH ROCK OR SACKCRETE KEYS
- 2T TYP FILL WITH MULTIPLE ROCK CHANNELS

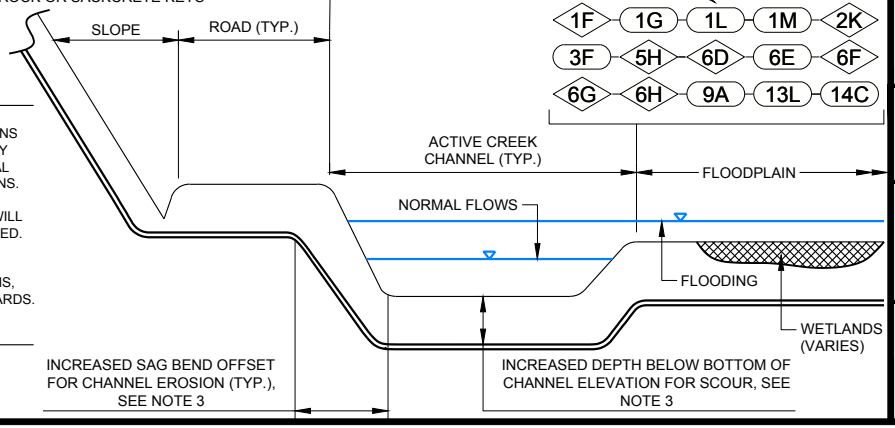
- 3A TRACK DISTURBED SLOPES
- 3D ROCK ARMORING ON DISTURBED SLOPES
- 3E COIR LOGS ON DISTURBED SLOPES
- 3F SUBMAR MATTS
- 4A TRENCH BREAKERS (FOAM AND SANDBAGS), MODIFIED SPACING
- 4B TRENCH DAMS (FOAM BAGS OR FINE GRAINED SOILS)
- 4C SACK-CRETE BREAKERS (STRUCTURAL BREAKER)
- 4D SLEEVE INTERFACE BETWEEN PIPELINE AND BREAKER
- 4F TRENCH BREAKER WITH DRAINAGE
- 4G SACK-CRETE ARMOR WITH BREAKERS
- 4H FLOWABLE FILL FOR TRENCH BACKFILL
- 5A SLOPE BREAKERS (TEMP AND PERMANENT), MODIFIED SPACING
- 5B SLOPE BREAKER ARMORED OUTLET
- 5C SLOPE BREAKERS WITH DIVERSION CHANNELS
- 5D ACCESS ROADS
- 5E TEMPORARY SLOPE BREAKER WITH DRAIN PIPE
- 5G NO WOOD CHIPS IN ROW
- 5H SURFACE WATER DIVERSIONS

- 6D ARMORED CHANNEL
- 6E TYP STREAM BANK STABILIZATION WITH VARIOUS CONCEPTUAL CONTROLS
- 6F RIPRAP GRADATIONS
- 6G ARMORED V-SHAPED AND U-SHAPED CHANNELS
- 6H TYP SURFACE WATER CONTROL LAYOUT
- 9A BUOYANCY MITIGATION
- 10A BENCH RE-CONSTRUCTION THROUGH NATURAL STEPS
- 11F AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS
- 13A TYP WATERBODY OPEN CUT
- 13B TYP WATERBODY FLUME METHOD
- 13C TYP WATERBODY DAM AND PUMP
- 13D TYP WATERBODY HDD METHOD
- 13E TYP ADDITIONAL WORKSPACE AT WATERBODY ACP SHP
- 13F TYP WETLAND OPEN CUT METHOD ACP AP-1 AP-2 AP-3 AP-4 AP-5
- 13G TYP CONSTRUCTION ROW IN WETLANDS ACP SHP
- 13H TYP ADDITIONAL WORKSPACE AT WETLAND CROSSINGS ACP SHP
- 13I TYP ADDITIONAL WORKSPACE AT BORED CROSSINGS FOR TWO-LANE ROADS AND RAILROADS ACP SHP
- 13J TYP CONSTRUCTION ROW IN NON-AG AREAS ACP SHP
- 13K TYP CONSTRUCTION ROW IN AG AREAS ACP SHP
- 13L TYP COFFERDAM CROSSING
- 14A SITE SPECIFIC DETAILED ENGINEERING
- 14B MESH ROCK FALL PROTECTION
- 14C BLASTING PLAN(S)
- 15C ACCESS TO REMOTE ROW LOCATIONS

1A 1B 1C 1D 1H 1I 1J 1K
2A 2C 2D 2E 2F 2G 2J 2L
2M 2N 2O 2P 2Q 2R 2S 2T
3A 3D 3E 4A 4B 4C 4D 4F
4G 4H 5A 5B 5C 5D 5E 5G
10A 11F 14A 14B 15C

13A THROUGH 13K

1F 1G 1L 1M 2K
3F 5H 6D 6E 6F
6G 6H 9A 13L 14C



NOTES

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2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.
3. SEPARATE TECHNICAL STUDY MAY BE NEEDED TO DETERMINE SAGBEND SETBACKS AND BURIAL DEPTHS, BASED ON SITE SPECIFIC EROSION AND SCOUR HAZARDS.

LEGEND

- XX SCHEDULE A
- XX SCHEDULE B

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
A	2017-02-28	FINAL	DBC	THR	-	AQK

NOTES

PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

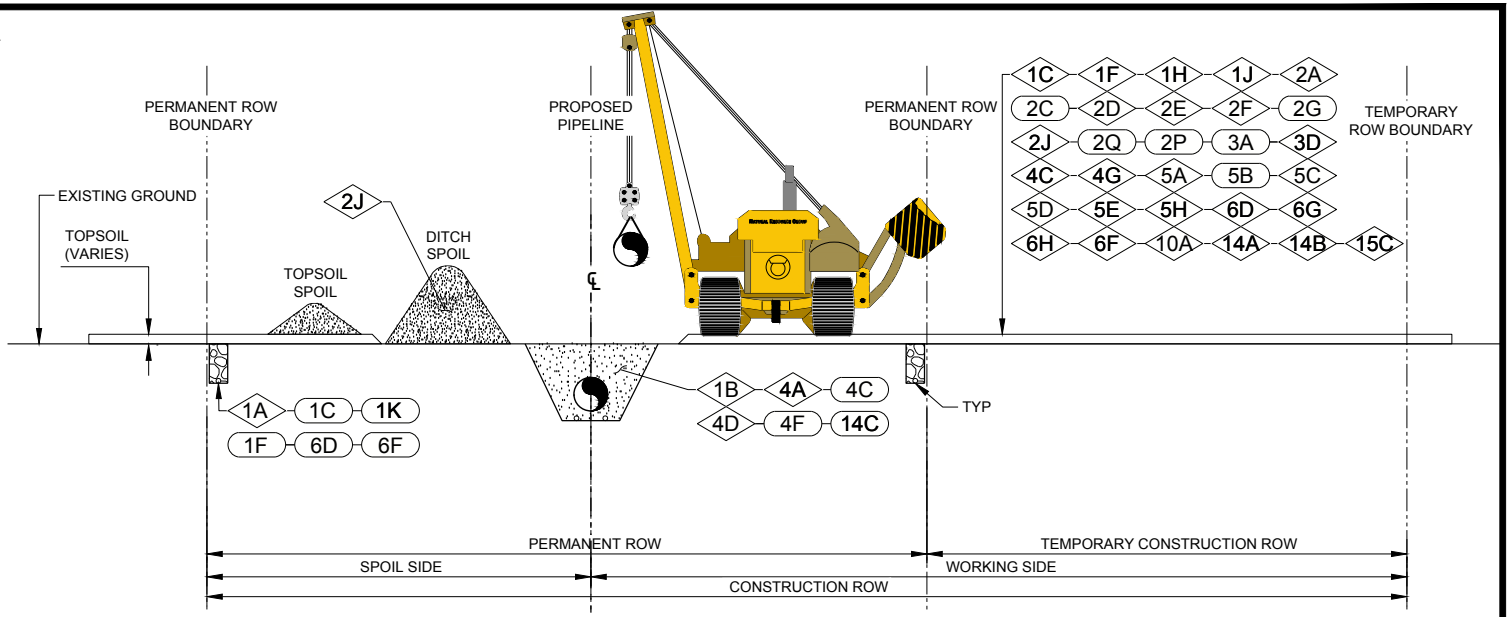
E - STEEP SLOPES WITH A SENSITIVE RESOURCE AT TOE (I.E. STREAM, WETLAND, ROAD)

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.		TypScenarios1
DESIGN	DBC	2017-02-28	SCALE		AS SHOWN
CADD	THR	2017-02-28	FIGURE		
CHECK	-	2017-02-28			1 OF 1
REVIEW	AQK	2017-02-28			

BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 1A FRENCH DRAIN (SIMPLE)
- 1B ENHANCED DRAIN (GERMAN DRAIN), IN PIPELINE TRENCH
- 1C TARGETED SEEP DRAINS, AT INTERSEPTED SEEPS
- 1F ARMORED CHANNEL WITH DRAIN PIPE
- 1H STEEP CONVEYANCE CHANNEL
- 1J SINGLE TARGETED SEEP COLLECTOR
- 1K ENERGY DISSIPATION BASIN
- 2A GRADING TEMPORARY ROW SURFACE
- 2C COMPACT BACKFILL
- 2D DRY SOILS AND BACKFILL
- 2E REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL
- 2F ROCK BACKFILL
- 2G GRADING TO MATCH EXISTING CONTOURS
- 2J SPOILS MANAGEMENT
- 2K GABIONS
- 2L SOIL-NAIL WITH TECCO MESH
- 2M EXTERNALLY STABILIZED RETAINING WALL SYSTEMS
- 2N GEOTEXTILE REINFORCED SYSTEMS
- 2O BENCH AND REGRADE WITH BACKFILL
- 2P CUT AND FILL CONSTRUCTION
- 2Q TYP SIDE HILL CUT AND FILL
- 3A TRACK DISTURBED SLOPES
- 3D ROCK ARMORING ON DISTURBED SLOPES
- 3E COIR LOGS ON DISTURBED SLOPES
- 4A TRENCH BREAKERS (FOAM AND SANDBAGS), MODIFIED SPACING
- 4C SACK-CRETE BREAKERS (STRUCTURAL BREAKER), SEE NOTE 1 FOR UNSTABLE FILL
- 4D SLEEVE INTERFACE BETWEEN PIPELINE AND BREAKER
- 4F TRENCH BREAKER WITH DRAINAGE
- 4G SACK-CRETE ARMOR WITH BREAKERS
- 4H FLOWABLE FILL FOR TRENCH BACKFILL
- 5A SLOPE BREAKERS (TEMP AND PERMANENT), MODIFIED SPACING
- 5B SLOPE BREAKER ARMORED OUTLET
- 5C SLOPE BREAKERS WITH DIVERSION CHANNELS
- 5D ACCESS ROADS
- 5E TEMPORARY SLOPE BREAKER WITH DRAIN PIPE
- 5G NO WOOD CHIPS IN ROW
- 5H SURFACE WATER DIVERSIONS
- 6D ARMORED CHANNEL
- 6F RIPRAP GRADATIONS



BEST IN CLASS (BIC) INCREMENTAL CONTROLS

- 6G ARMORED V-SHAPED AND U-SHAPED CHANNELS
- 6H TYP SURFACE WATER CONTROL LAYOUT
- 10A BENCH RE-CONSTRUCTION THROUGH NATURAL STEPS
- 11F AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS
- 14A SITE SPECIFIC DETAILED ENGINEERING
- 14B MESH ROCK FALL PROTECTION
- 14C BLASTING PLAN(S)
- 15C ACCESS TO REMOTE ROW LOCATIONS

NOTES

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
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3. EXAMPLE SECTION SHOWS A TYPICAL SCENARIO. ACTUAL CUT/FILL CONDITIONS MAY VARY FOR EACH SITE.

LEGEND

- XX SCHEDULE A
- XX SCHEDULE B

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
F	2017-02-28	FINAL	DBC	THR	-	AQK

NOTES

PROJECT

BIC STEEP SLOPE
HAZARD MITIGATION PROGRAM

TITLE

F - STEEP SLOPES PREVIOUSLY MODIFIED BY CUTTING AND FILLING

Atlantic Coast Pipeline

PROJECT No.		1535050	FILE No.	TypScenarios4
DESIGN	DBC	2017-02-28	SCALE	AS SHOWN
CADD	THR	2017-02-28	FIGURE	
CHECK	-	2017-02-28		1 OF 1
REVIEW	AQK	2017-02-28		

Best-In-Class Incremental Controls

DOMINION BIC PROGRAM FOR ACP/SHP
SUMMARY LISTING OF INCREMENTAL CONTROLS (SUPPORTING TYPICAL SCENARIOS)
REVISED Feb 28, 2017

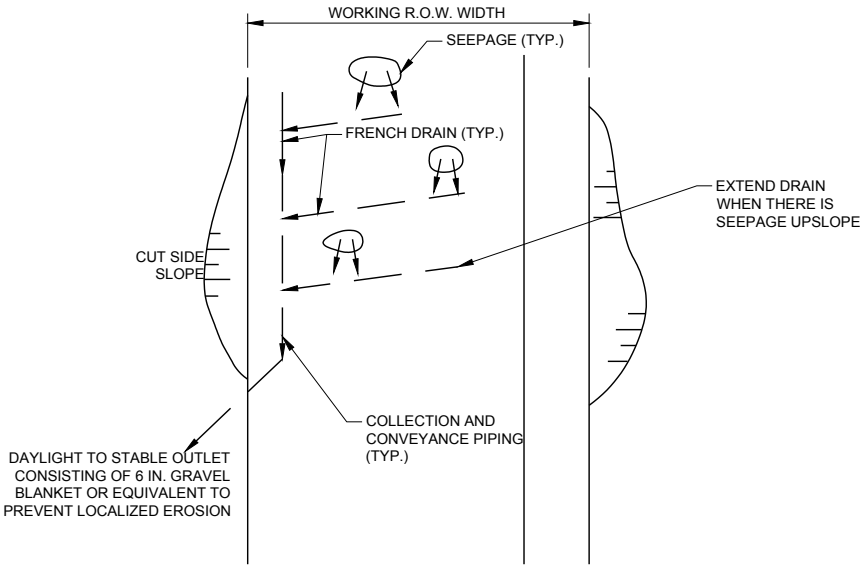
No.	GROUP	GROUP NO.	INCREMENTAL CONTROL SHEET TITLE	REV.	DATE	SHEET NO.	(C)omplete/(P)ending/(U)pdated	SOURCE DOCUMENT:
1	COVER	0	COVER SHEET	F	2/28/2017	0	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
2	SUBSURFACE DRAINAGE	1	FRENCH DRAIN (SIMPLE)	F	2/28/2017	1A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
3			ENHANCED DRAIN (GERMAN DRAIN)	F	2/28/2017	1B	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
4			TARGETED SEEP DRAINS	F	2/28/2017	1C	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
5			BLEEDER DRAIN	F	2/28/2017	1D	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
6			DRAIN PIPE OUTFALL RIPRAP APRON	F	2/28/2017	1E	C	2017 ANNUAL STANDARDS AND SPECIFICATIONS, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT FOR CONSTRUCTION AND MAINTENANCE OF PIPELINE PROJECTS IN VIRGINIA, DOMINION TRANSMISSION, INC. (FEBRUARY 2017)
7			ARMORED CHANNEL WITH DRAIN PIPE	F	2/28/2017	1F	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
8			DEWATERING	F	2/28/2017	1G	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
9			STEEP CONVEYANCE CHANNEL	F	2/28/2017	1H	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
10			CHANGED SEEP CHARACTERISTICS	F	2/28/2017	1I	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
11			TARGETED SEEP COLLECTOR	F	2/28/2017	1J	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
12			ENERGY DISSIPATION BASIN	F	2/28/2017	1K	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
13			DEWATERING DISCHARGE BAG	F	2/28/2017	1L	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
14			DEWATERING DISCHARGE IN UPLAND AREA	F	2/28/2017	1M	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
15	GRADING, BACKFILL, MECH STABILIZE, CUT/FILL	2	GRADING TEMPORARY ROW SURFACE	F	2/28/2017	2A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
16			GRADING TRENCH WITH OUTBOARD WEDGE	F	2/28/2017	2B	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
17			COMPACT BACKFILL	F	2/28/2017	2C	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
18			DRY SOILS AND BACKFILL	F	2/28/2017	2D	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
19			REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL	F	2/28/2017	2E	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
20			ROCK BACKFILL (WITH DRAIN)	F	2/28/2017	2F	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
21			GRADING TO MATCH EXISTING CONTOURS	F	2/28/2017	2G	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
22			GRADING TO MINIMIZE BACKFILL OVER LANDSLIDE	F	2/28/2017	2H	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
23			TYPICAL TRENCH DIMENSIONS IN GENERALLY FLAT TERRAIN	F	2/28/2017	2I	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
24			SPOILS MANAGEMENT	F	2/28/2017	2J	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
25			GABIONS	F	2/28/2017	2K	C	2017 ANNUAL STANDARDS AND SPECIFICATIONS, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT FOR CONSTRUCTION AND MAINTENANCE OF PIPELINE PROJECTS IN VIRGINIA, DOMINION TRANSMISSION, INC. (FEBRUARY 2017)
26			SOIL NAIL TECCO MESH	F	2/28/2017	2L	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
27			EXTERNALLY STABILIZED RETAINING WALL SYSTEMS	F	2/28/2017	2M	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
28			GEOTEXTILE REINFORCED SYSTEMS	F	2/28/2017	2N	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
29			BENCH AND REGRADE WITH BACKFILL	F	2/28/2017	2O	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
30			CUT/FILL CONSTRUCTION	F	2/28/2017	2P	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
31			TYP SIDE HILL CUT AND FILL	F	2/28/2017	2Q	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
32			TYP FILL WITH ROCK UNDER DRAIN	F	2/28/2017	2R	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
33			TYP BENCH AND REGRADE BACKFILL WITH ROCK OR SACKCRETE KEYS	F	2/28/2017	2S	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
34			TYP FILL WITH MULTIPLE ROCK CHANNELS	F	2/28/2017	2T	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
35	SURFACE EROSION	3	TRACK DISTURBED SLOPES	F	2/28/2017	3A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
36			RE-VEGETATE DISTURBED SLOPES	F	2/28/2017	3B	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
37			COIR CLOTH ON DISTRUBED SLOPES	F	2/28/2017	3C	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
38			ROCK ARMORING ON DISTRUBED SLOPES	F	2/28/2017	3D	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
39			COIR LOGS ON DISTURBED SLOPES	F	2/28/2017	3E	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
40			SUBMAR MATTS	F	2/28/2017	3F	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
41	AKERS, TRENCH OVEMENTS	4	TRENCH BREAKERS (FOAM AND SANDBAGS)	F	2/28/2017	4A	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
42			TRENCH DAMS (FOAM, BAGS, OR FINE GRAINED SOILS)	F	2/28/2017	4B	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
43			SACK-CRETE BREAKERS (STRUCTURAL BREAKER)	F	2/28/2017	4C	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
44			SLEEVE INTERFACE BETWEEN PIPELINE AND BREAKER	F	2/28/2017	4D	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016

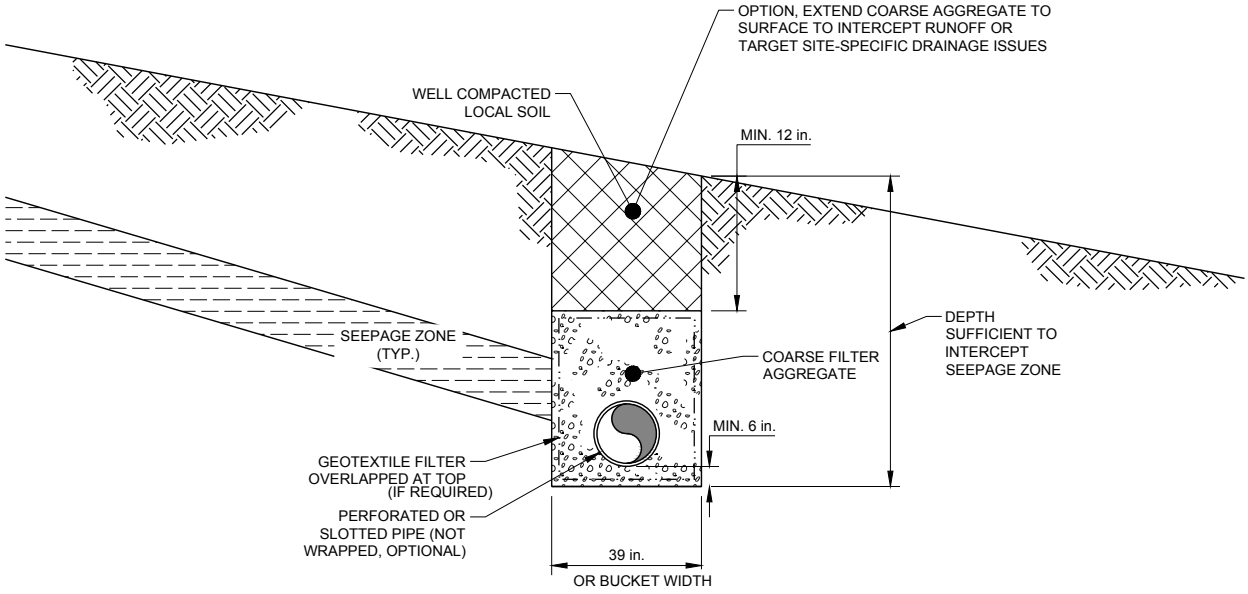
DOMINION BIC PROGRAM FOR ACP/SHP
SUMMARY LISTING OF INCREMENTAL CONTROLS (SUPPORTING TYPICAL SCENARIOS)
REVISED Feb 28, 2017

No.	GROUP	GROUP NO.	INCREMENTAL CONTROL SHEET TITLE	REV.	DATE	SHEET NO.	(C)omplete/(P)ending/(U)pdated	SOURCE DOCUMENT:
45	TRENCH BRE IMPRO		SEAL BOTTOM OF TRENCH WITH SANDBAGS	F	2/28/2017	4E	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
46			TRENCH BREAKER WITH DRAINAGE	F	2/28/2017	4F	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
47			SACK-CRETE ARMOR WITH BREAKERS	F	2/28/2017	4G	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
48			FLOWABLE FILL FOR TRENCH BACKFILL	F	2/28/2017	4H	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
49	ROW SURFACE, SLOPE BREAKERS	5	SLOPE BREAKERS (TEMP AND PERMANENT)	F	2/28/2017	5A	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
50			SLOPE BREAKER ARMORED OUTLET	F	2/28/2017	5B	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
51			SLOPE BREAKERS WITH DIVERSION CHANNELS	F	2/28/2017	5C	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
52			ACCESS ROADS	F	2/28/2017	5D	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
53			TEMPORARY SLOPE BREAKER WITH DRAIN PIPE	F	2/28/2017	5E	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
54			SACK-CRETE WEDGE	F	2/28/2017	5F	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
55			NO WOOD CHIPS IN ROW	F	2/28/2017	5G	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
56			SURFACE WATER DIVERSIONS	F	2/28/2017	5H	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
57	ROW DIVERSIONS	6	COIR-LINED VEGETATED DIVERSION CHANNEL	F	2/28/2017	6A	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
58			BROW DITCH	F	2/28/2017	6B	C	SLOPE STABILITY POLICY AND PROCEEDURE FOR PIPELINE DESIGN, CONSTRUCTION AND RIGHT OF WAY MAINTENANCE, DOMINION TRANSMISSION, INC., ENGINEERING SERVICES REFERENCE MANUAL (SEPTEMBER 28, 2016)
59			ROCK FILTER IN TRENCH	F	2/28/2017	6C	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
60			ARMORED CHANNELS	F	2/28/2017	6D	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
61			TYP BANK ARMORING	F	2/28/2017	6E	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
62			RIPRAP GRADATIONS	F	2/28/2017	6F	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
63			ARMORED V-SHAPED AND U-SHAPED CHANNELS	F	2/28/2017	6G	C	2017 ANNUAL STANDARDS AND SPECIFICATIONS, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT FOR CONSTRUCTION AND MAINTENANCE OF PIPELINE PROJECTS IN VIRGINIA, DOMINION TRANSMISSION, INC. (FEBRUARY 2017)
64			TYP SURFACE WATER CONTROL LAYOUT	F	2/28/2017	6H	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
65	SILT FENCE	7	SILT FENCE	F	2/28/2017	7A	C	2017 ANNUAL STANDARDS AND SPECIFICATIONS, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT FOR CONSTRUCTION AND MAINTENANCE OF PIPELINE PROJECTS IN VIRGINIA, DOMINION TRANSMISSION, INC. (FEBRUARY 2017)
66			SUPER SILT FENCE	F	2/28/2017	7B	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
67	PL	8	ROCK GUARD ON PIPELINE	F	2/28/2017	8A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
68	PL	9	BUOYANCY MITIGATION	F	2/28/2017	9A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
69	BENCHES	10	TYP BENCH RE-CONSTRUCTION	F	2/28/2017	10A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
70	MONITORING	11	GEODETIC MONITORING	F	2/28/2017	11A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
71			STRAIN GAUGE MONITORING	F	2/28/2017	11B	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
72			SLOPE INCLINOMETER MONITORING	F	2/28/2017	11C	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
73			SLOPE INCLINOMETER CASING	F	2/28/2017	11D	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
74			STANDPIPE PIEZOMETER MONITORING	F	2/28/2017	11E	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
75			AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS	F	2/28/2017	11F	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
76	STRESS RELIEF	12	STRESS RELIEF EXCAVATIONS	F	2/28/2017	12A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
77			SELECT (DEFORMABLE) BACKFILL AROUND PIPELINE IN LANDSLIDE	F	2/28/2017	12B	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
78			SHEAR TRENCH	F	2/28/2017	12C	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
79	ONAL WORKSPACE, TYP CROSSING METHODS	13	TYP WATERBODY OPEN CUT	F	2/28/2017	13A	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
80			TYP WATERBODY FLUME METHOD	F	2/28/2017	13B	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
81			TYP WATERBODY DAM AND PUMP	F	2/28/2017	13C	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
82			TYP WATERBODY HDD METHOD	F	2/28/2017	13D	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
83			TYP ADDITIONAL WORKSPACE AT WATERBODY ACP AP-1	F	2/28/2017	13E-1	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
84			TYP ADDITIONAL WORKSPACE AT WATERBODY ACP AP-1 AP-2 AP-3 AP-4 AP-5	F	2/28/2017	13E-2	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
85			TYP ADDITIONAL WORKSPACE AT WATERBODY SHP TL-635 TL-636	F	2/28/2017	13E-3	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
86			TYP WETLAND OPEN CUT METHOD ACP AP-1 AP-2 AP-3 AP-4 AP-5	F	2/28/2017	13F	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
87			TYP CONSTRUCTION ROW IN WETLANDS ACP AP-1	F	2/28/2017	13G-1	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
88			TYP CONSTRUCTION ROW IN WETLANDS ACP AP-2	F	2/28/2017	13G-2	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
89			TYP CONSTRUCTION ROW IN WETLANDS COLLOCATED SHP TL-635 TL-636	F	2/28/2017	13G-3	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
90			TYP CONSTRUCTION ROW IN WETLANDS NOT-COLLOCATED SHP TL-635 TL-636	F	2/28/2017	13G-4	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
91			TYP ADDITIONAL WORKSPACE AT WETLAND CROSSINGS ACP AP-1	F	2/28/2017	13H-1	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
92			TYP ADDITIONAL WORKSPACE AT WETLAND CROSSINGS ACP AP-2 AP-3 AP-4 AP-5	F	2/28/2017	13H-2	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
93			TYP ADDITIONAL WORKSPACE AT WETLAND CROSSINGS SHP TL-635 TL-636	F	2/28/2017	13H-3	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)

DOMINION BIC PROGRAM FOR ACP/SHP
SUMMARY LISTING OF INCREMENTAL CONTROLS (SUPPORTING TYPICAL SCENARIOS)
REVISED Feb 28, 2017

No.	GROUP	GROUP NO.	INCREMENTAL CONTROL SHEET TITLE	REV.	DATE	SHEET NO.	(C)omplete/(P)ending/(U)pdated	SOURCE DOCUMENT:
94	TYP ROW CONFIGURATIONS, ADDITIC		TYP ADDITIONAL WORKSPACE AT BORED CROSSINGS FOR TWO-LANE ROADS AND RAILROADS ACP AP-1	F	2/28/2017	13I-1	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
95			TYP ADDITIONAL WORKSPACE AT SINGLE-LANE ROADS AND BORED ROADS ACP AP-1 AP-2 AP-3 AP-4 AP-5	F	2/28/2017	13I-2	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
96			TYP ADDITIONAL WORKSPACE AT ALL BORED ROADS SHP TL-635 TL-636	F	2/28/2017	13I-3	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
97			TYP CONSTRUCTION ROW IN NON-AG AREAS ACP AP-2	F	2/28/2017	13J-1	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
98			TYP CONSTRUCTION ROW IN NON-AG AREAS AND WETLANDS ACP AP-3 AP-4 AP-5	F	2/28/2017	13J-2	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
99			TYP CONSTRUCTION ROW IN COLLOCATED NON-AG AREAS SHP TL-635 TL-636	F	2/28/2017	13J-3	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
100			TYP CONSTRUCTION ROW NOT-COLLOCATED IN NON-AG AREAS SHP TL-635 TL-636	F	2/28/2017	13J-4	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
101			TYP CONSTRUCTION ROW IN AG AREAS ACP AP-2	F	2/28/2017	13K-1	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
102			TYP CONSTRUCTION ROW IN AG AREAS ACP AP-3 AP-4 AP-5	F	2/28/2017	13K-2	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
103			TYP CONSTRUCTION ROW COLLOCATED IN AG AREAS SHP TL-635 TL-636	F	2/28/2017	13K-3	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
104			TYP CONSTRUCTION ROW NOT-COLLOCATED IN AG AREAS SHP TL-635 TL-636	F	2/28/2017	13K-4	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
105			TYP COFFERDAM CROSSING	F	2/28/2017	13L	C	EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL, WEST VIRGINIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF WATER AND WASTE MANAGEMENT (2016)
106	DETAILED ENG	14	SITE SPECIFIC DETAILED ENGINEERING	F	2/28/2017	14A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
107			MESH ROCK FALL PROTECTION	F	2/28/2017	14B	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
108			BLASTING PLANS	F	2/28/2017	14C	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1F (NOVEMBER 2016 REV 3)
109	PLANNING	15	AVOIDANCE	F	2/28/2017	15A	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
110			EXCAVATION REMOVAL OF HAZARD	F	2/28/2017	15B	C	ACP/SHP FERC RESOURCE REPORT 1, APPENDIX 1D (SEPTEMBER 2015)
111			ACCESS TO REMOTE ROW LOCATIONS	F	2/28/2017	15C	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016
112	SPECIAL HAZARD	16	KARST HAZARDS	F	2/28/2017	16A	C	GOLDER, "GEOTECHNICAL AND GEOLOGICAL ENGINEERING SUPPORT FOR PIPELINES IN STEEPLY SLOPING TERRAIN", MARCH 2016





NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

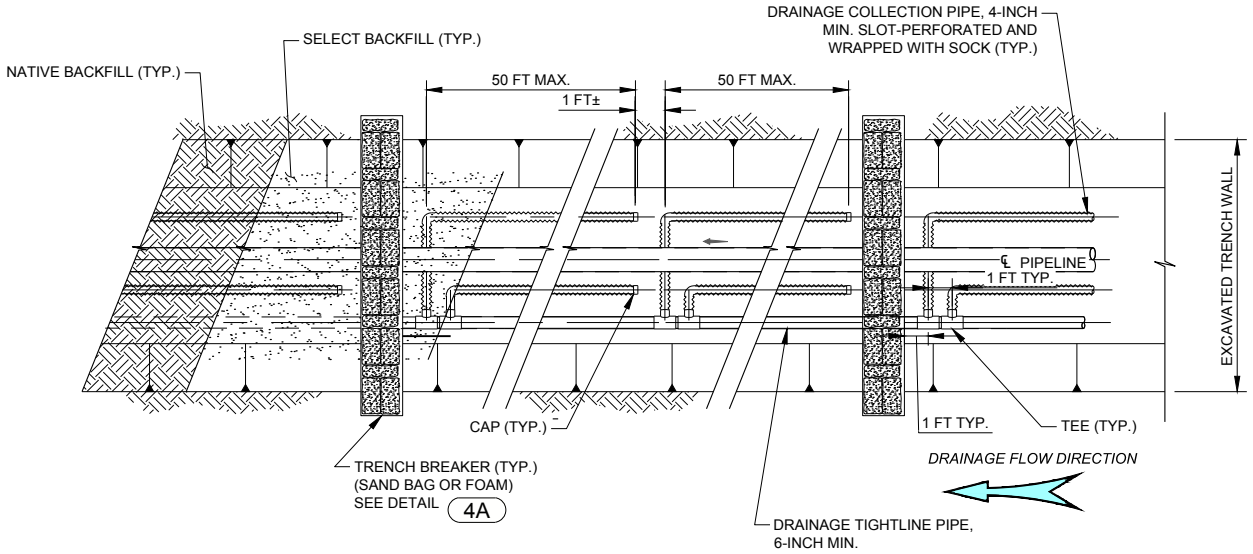
CONSULTANT

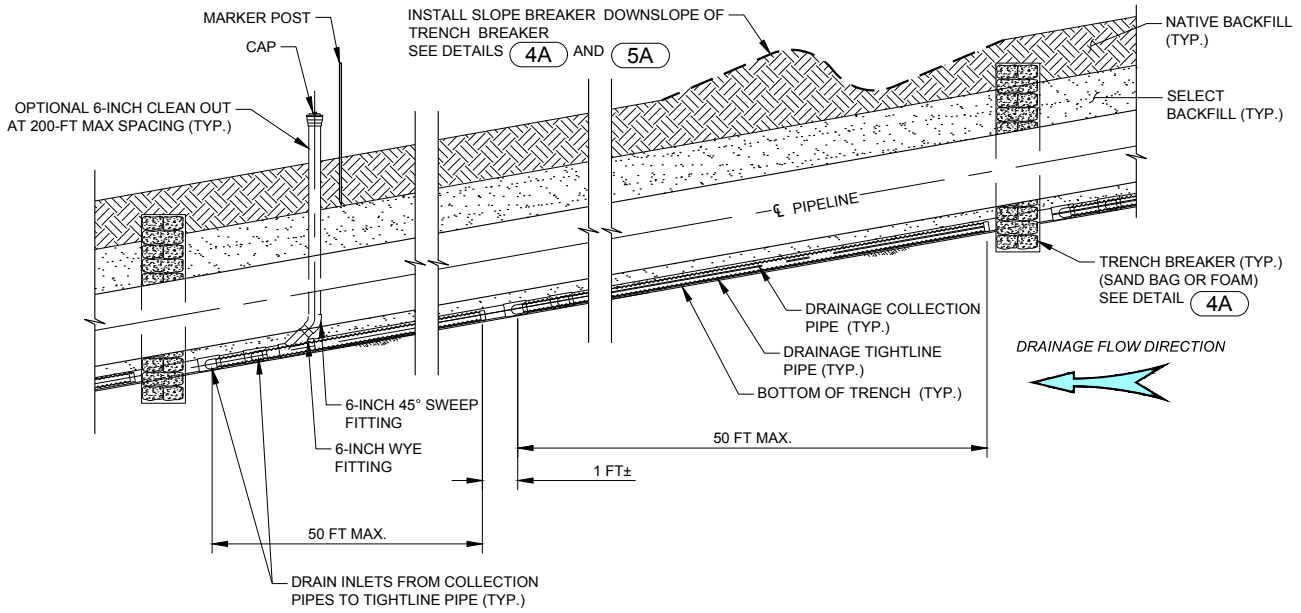
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
FRENCH DRAIN (SIMPLE)

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1A





NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. SPACING OF CLEAN-OUTS TO BE DETERMINED BASED ON SITE CONDITIONS AND OPERATION AND MAINTENANCE REQUIREMENTS.

CLIENT
DOMINION

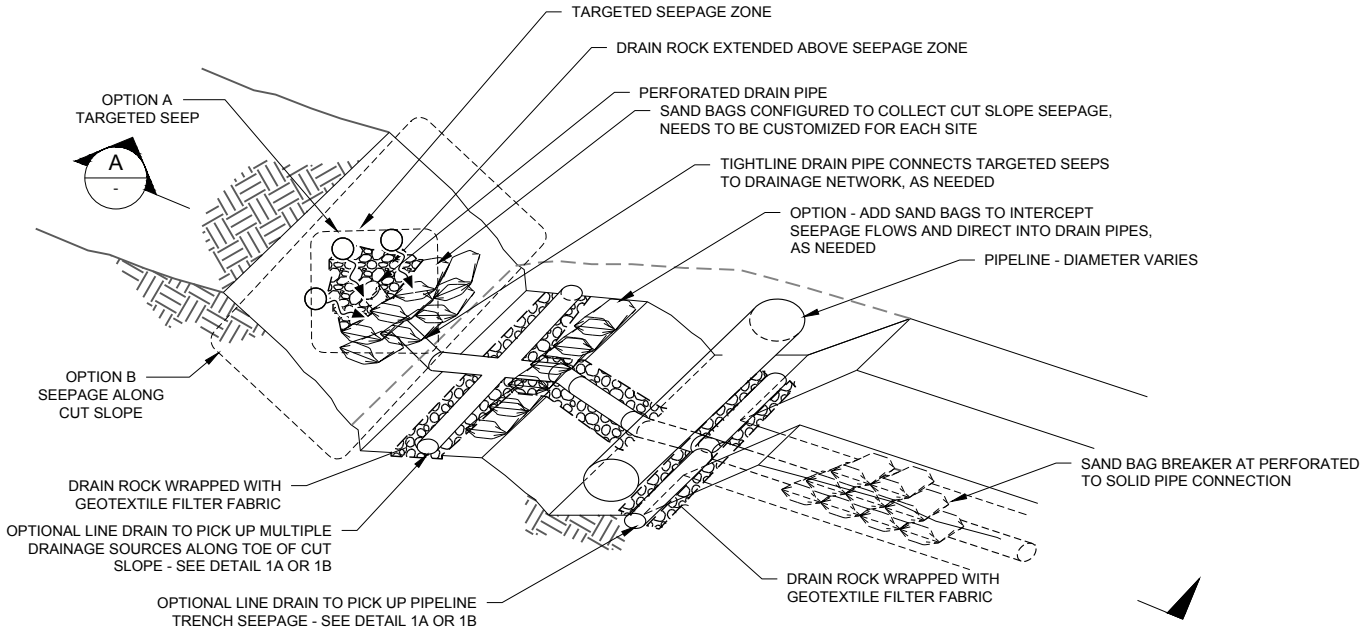
PROJECT
BIC/INCREMENTAL CONTROLS

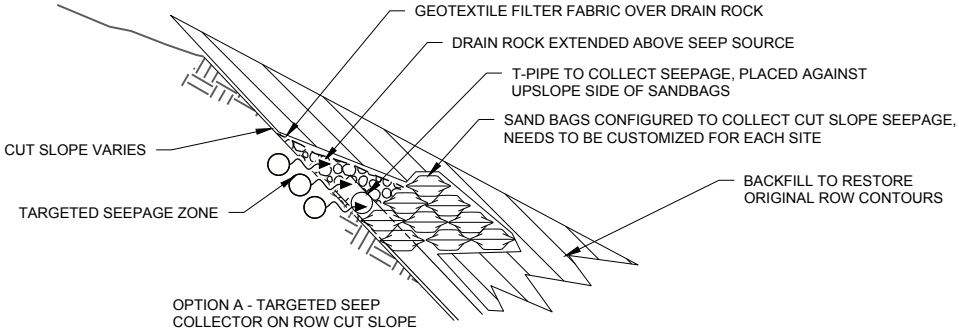
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

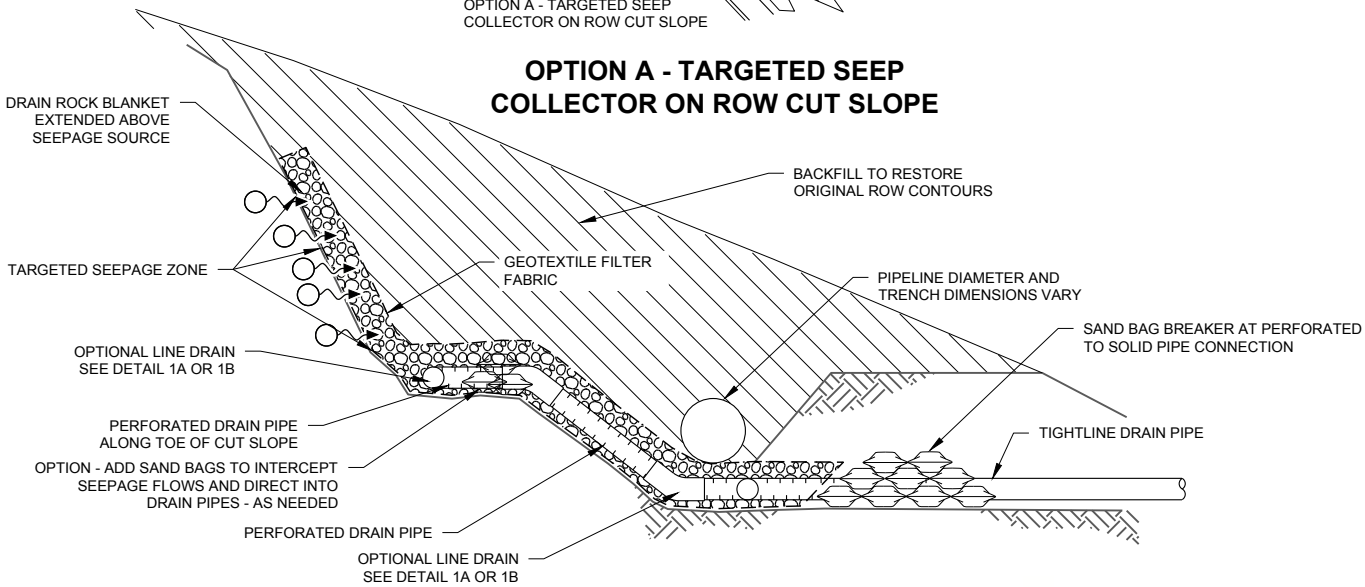
TITLE
ENHANCED DRAIN (GERMAN DRAIN)

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1B





OPTION A - TARGETED SEEP COLLECTOR ON ROW CUT SLOPE



OPTION B - TARGETED SEEP COLLECTOR ON ROW CUT SLOPE

A
-

CLIENT
DOMINION

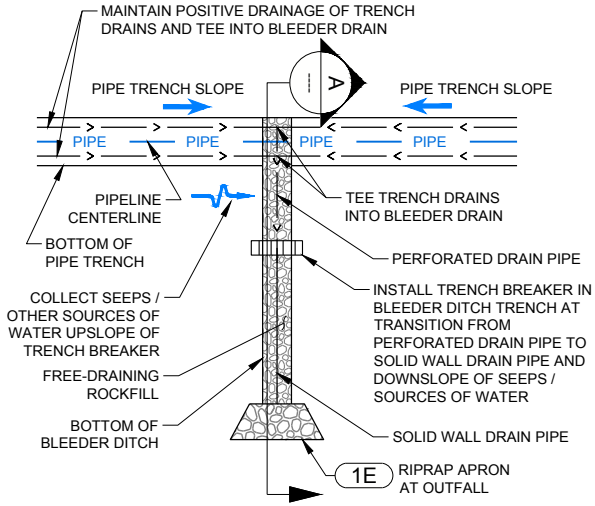
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

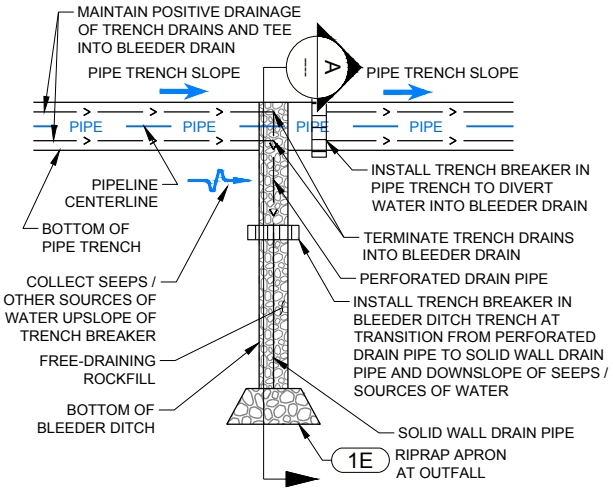
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TARGETED SEEP DRAINS

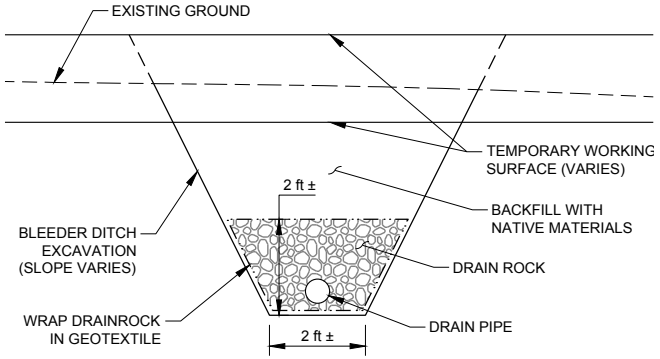
PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1C



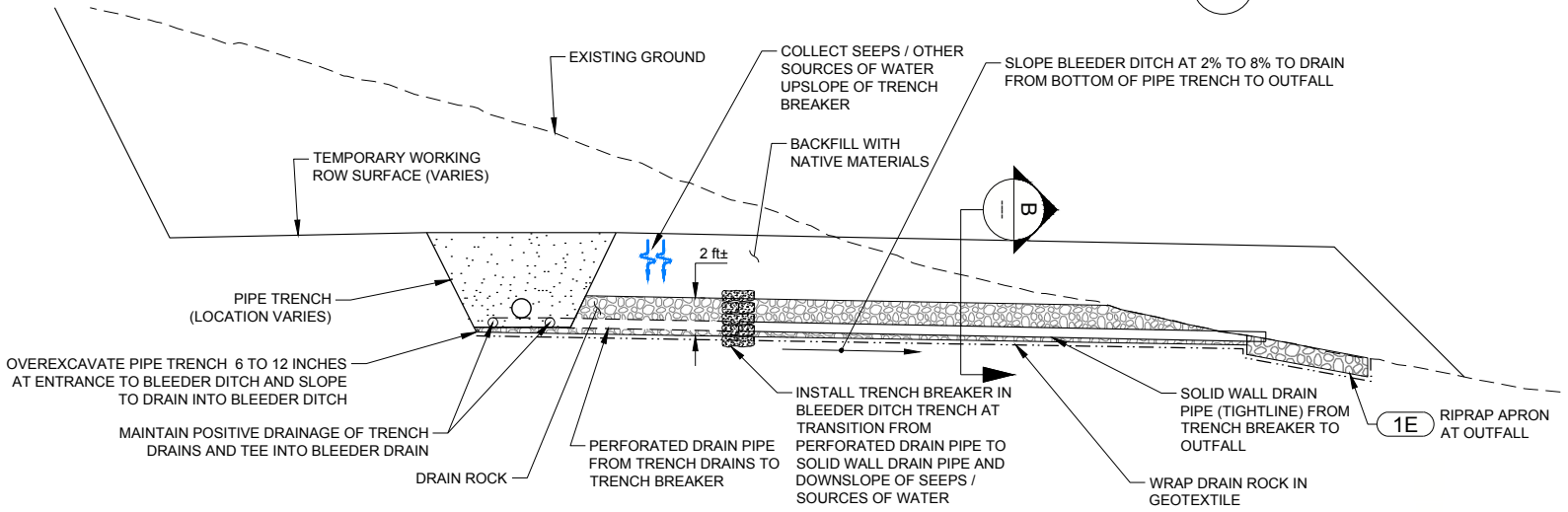
BLEEDER DRAIN WITH FLAT PIPE TRENCH



BLEEDER DRAIN WITH SLOPED PIPE TRENCH



B BLEEDER DRAIN DITCH SECTION



A BLEEDER DRAIN PROFILE

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. INSTALL BLEEDER DITCH IN SIDESLOPE SCENARIOS AT 100 FT INTERVALS, AT LOW POINTS IN THE PIPELINE TRENCH, OR AS NEEDED TO COLLECT SEEPS, SOURCES OF WATER, OR OTHER DRAINS.
3. NATIVE MATERIALS MAY BE USED DOWNSLOPE OF BLEEDER DITCH TRENCH BREAKER INSTEAD OF DRAINFILL PROVIDED THAT NATIVE BACKFILL MATERIALS ARE FREE-DRAINING AND NO SEEPS OR SOURCES OF WATER ARE IDENTIFIED DOWNSLOPE OF THE PIPE TRENCH.
4. LENGTH OF BLEEDER DRAIN WILL VARY AS NEEDED TO MAINTAIN POSITIVE DRAINAGE IN DITCH TO OUTFALL.

CLIENT
DOMINION

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
DESIGNED	DBC
PREPARED	REDMOND
REVIEWED	-
APPROVED	AQK

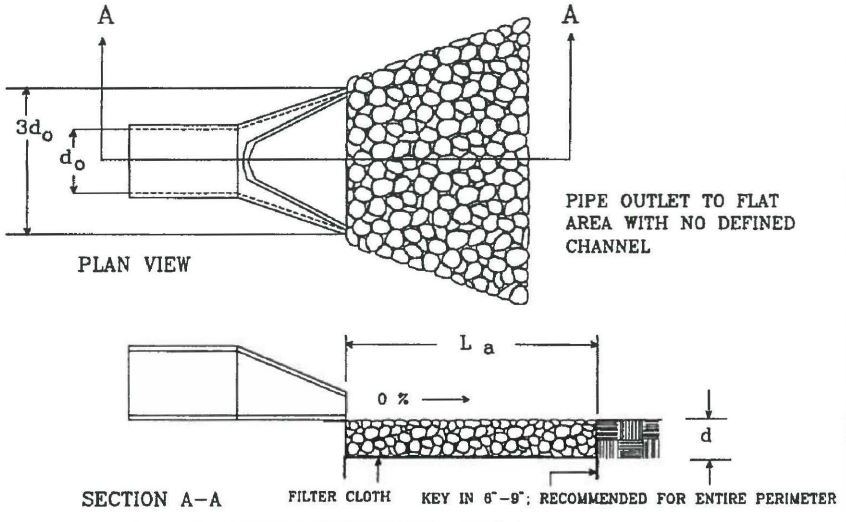
PROJECT
BIC/INCREMENTAL CONTROLS

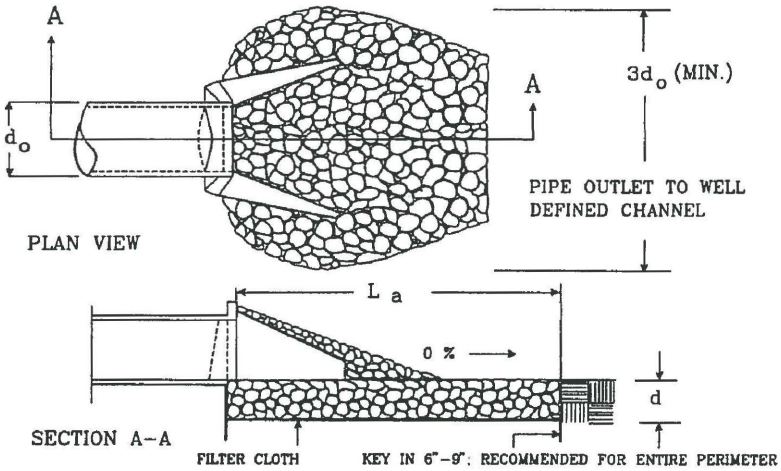
TITLE
BLEEDER DRAIN

PROJECT NO.	PHASE	REV.	FIGURE
1535050	500	F	1D

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
1 in
0

PIPE OUTLET CONDITIONS





NOTES: 1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
2. La IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18–3 AND 3.18–4.
3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.

CLIENT
DOMINION

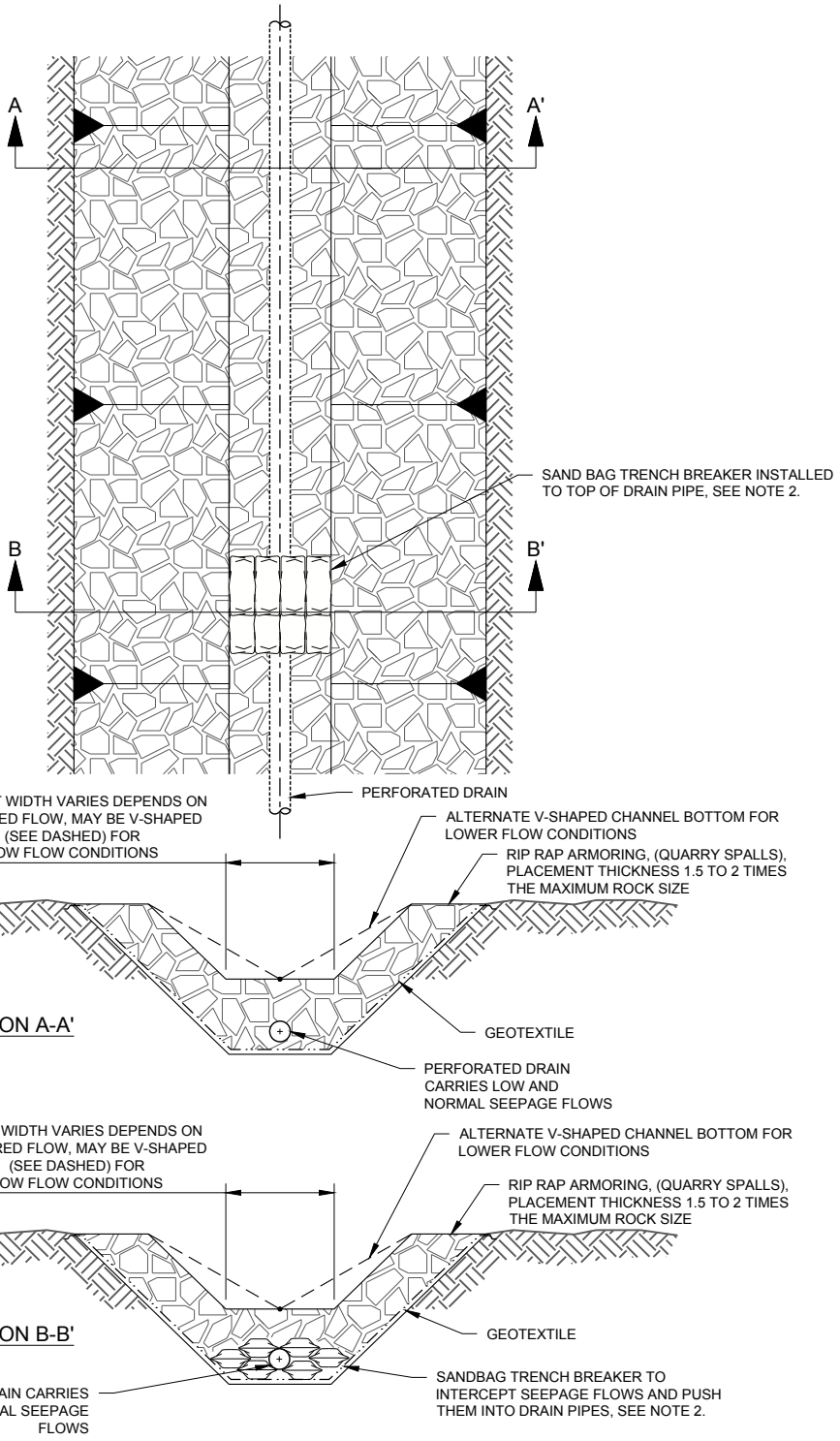
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
DRAIN PIPE OUTFALL RIPRAP APRON

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1E



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. 100-FT MAX SPACING FOR BREAKERS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ARMORED CHANNEL WITH DRAIN PIPE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1F

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. SPECIAL STUDIES MAY BE REQUIRED TO SUPPORT DESIGN AND IMPLEMENTATION OF SUBSURFACE DEWATERING MEASURES, WHICH MAY INCLUDE USING WELL POINTS, SUMPS, WELLS, DRAINS, DIVERSIONS, ETC.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

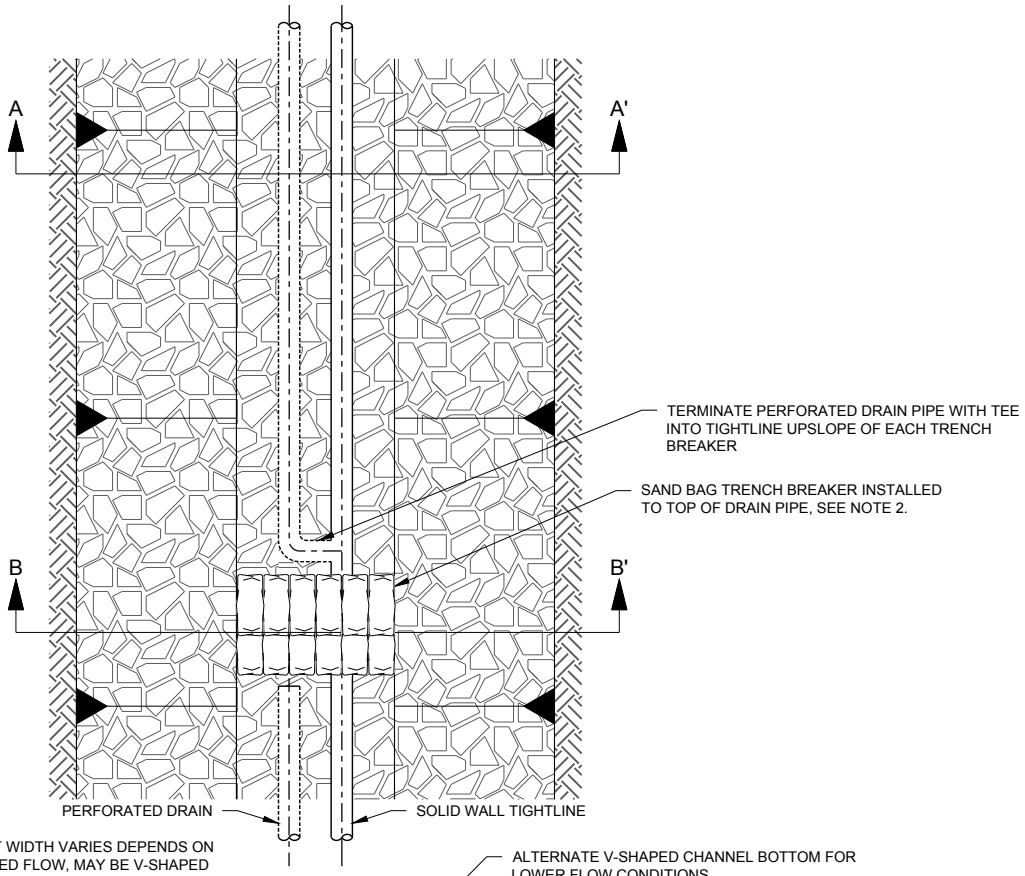
CONSULTANT
Golder Associates

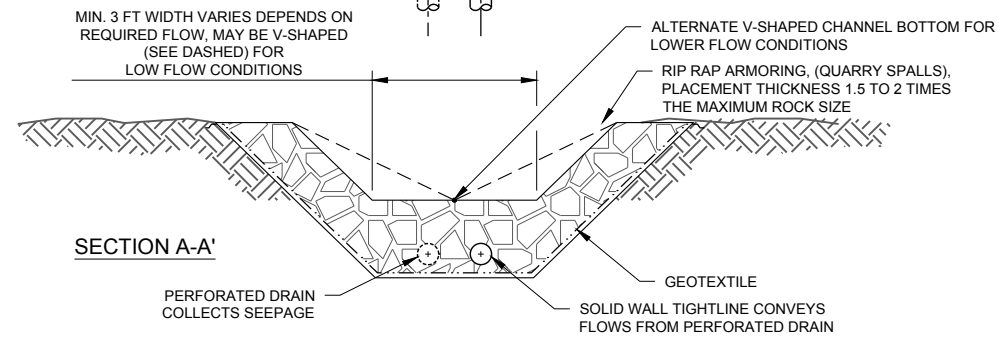
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

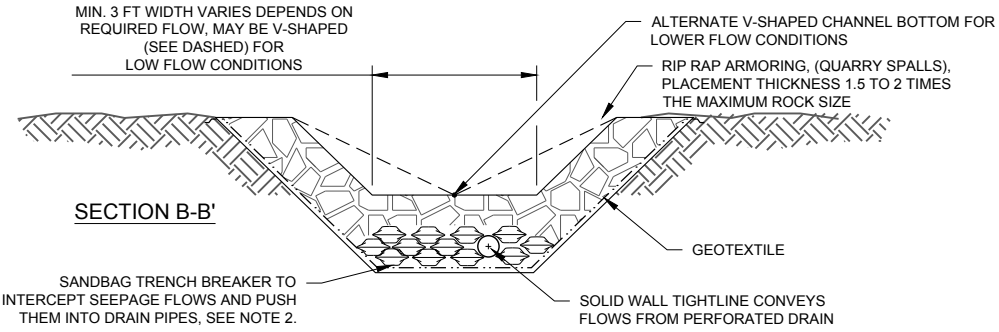
TITLE
DEWATERING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1G

0 1m
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A







NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. 100-FT MAX SPACING FOR BREAKERS.

CLIENT
DOMINION

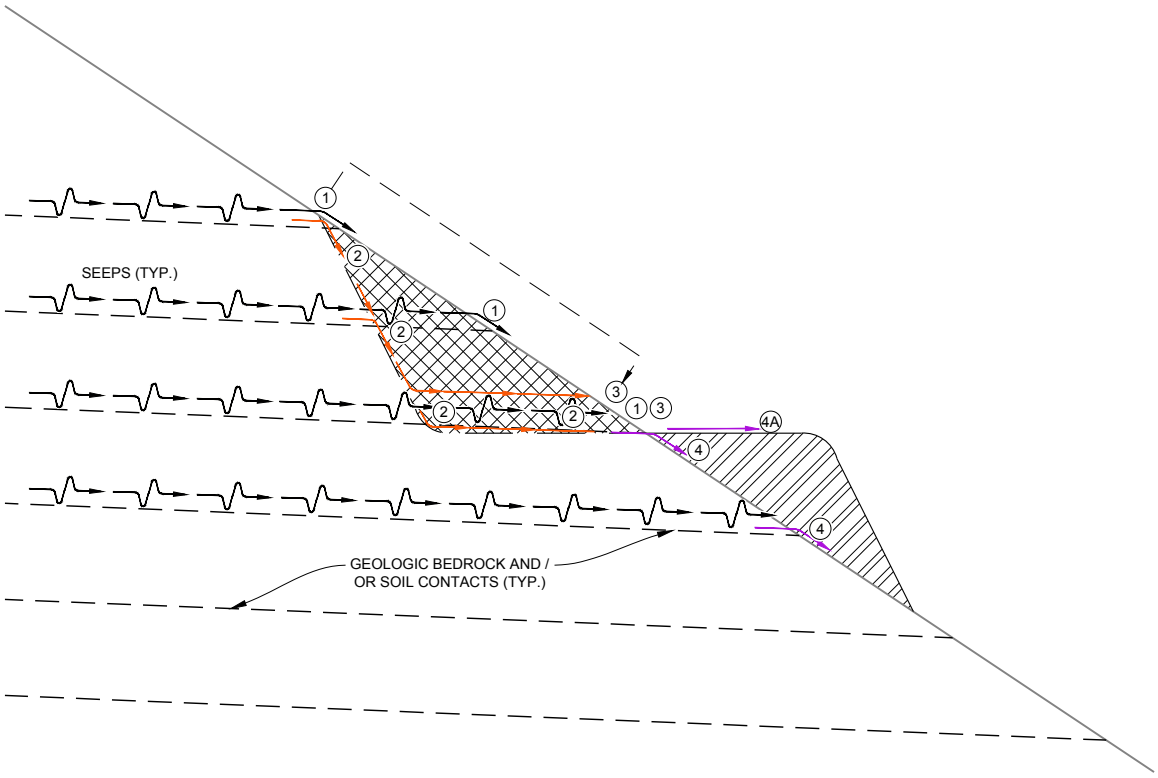
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
STEEP CONVEYANCE CHANNEL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1H



NOTE(S)

1. INSTALL PERMANENT AND / OR TEMPORARY SEEP COLLECTORS AT THE LOWEST OR DEEPEST CUT INTO NATIVE GROUND, AND AT CONTACTS AND TRANSITIONS BETWEEN BEDROCK OR SOIL UNITS (SEE (2)).
2. INSTALL TEMPORARY SEEP COLLECTORS TO PROTECT AGAINST SATURATION OF SPOILS (SEE (4)).
3. SEEP COLLECTORS SHOULD NOT BE LOCATED AT BACKFILL FACE AFTER RIGHT-OF-WAY RESTORATION (SEE (1)), UNLESS THAT IS THE LOWEST OR DEEPEST LOCATION OF DISTRIBUTION IN THE FINAL RIGHT-OF-WAY RESTORATION (SEE (5)).
4. ADDITIONAL MITIGATION MEASURES MAY BE NEEDED TO ADDRESS SATURATED BACKFILL AND / OR SPOILS, BASED ON SITE SPECIFIC CONDITIONS.

KEY

(1) SEEPS EXPOSED AT SURFACE BEFORE RIGHT-OF-WAY CONSTRUCTION.

(2) SEEP EXPOSED AFTER CONSTRUCTION OF THE RIGHT-OF-WAY, WITH POTENTIAL TO SATURATE BACKFILL, AND EXPRESSED IN DIFFERENT LOCATIONS AFTER CONSTRUCTION RESTORATION OF RIGHT-OF-WAY (3).

(4) SATURATES TEMPORARY SPOILS DURING CONSTRUCTION OF TEMPORARY RIGHT-OF-WAY, FROM BENEATH OR FROM SURFACE FLOWS (4A).

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PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
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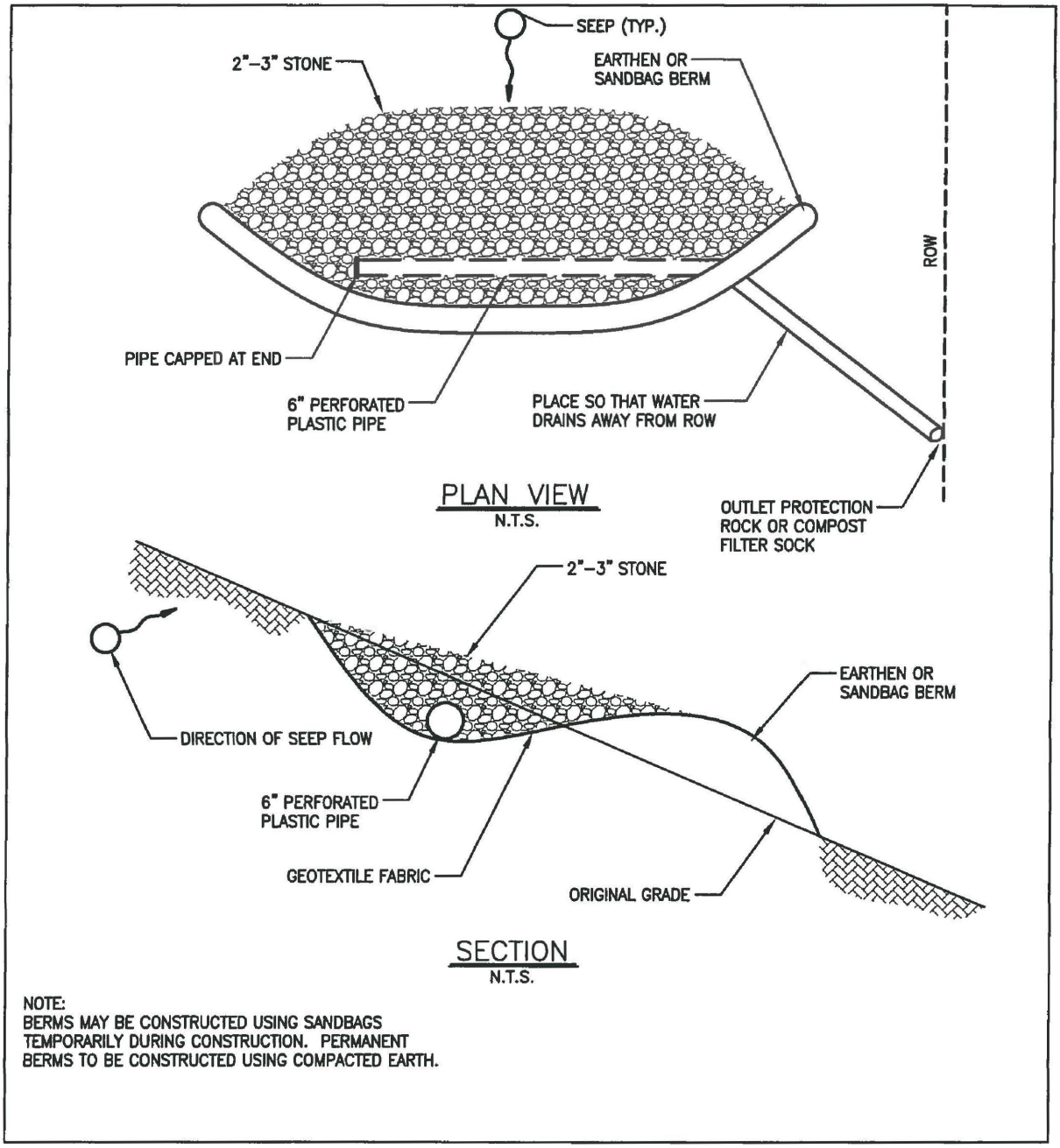
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
CHANGED SEEP CHARACTERISTICS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1l



NOTE:
BERMS MAY BE CONSTRUCTED USING SANDBAGS TEMPORARILY DURING CONSTRUCTION. PERMANENT BERMS TO BE CONSTRUCTED USING COMPACTED EARTH.

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PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
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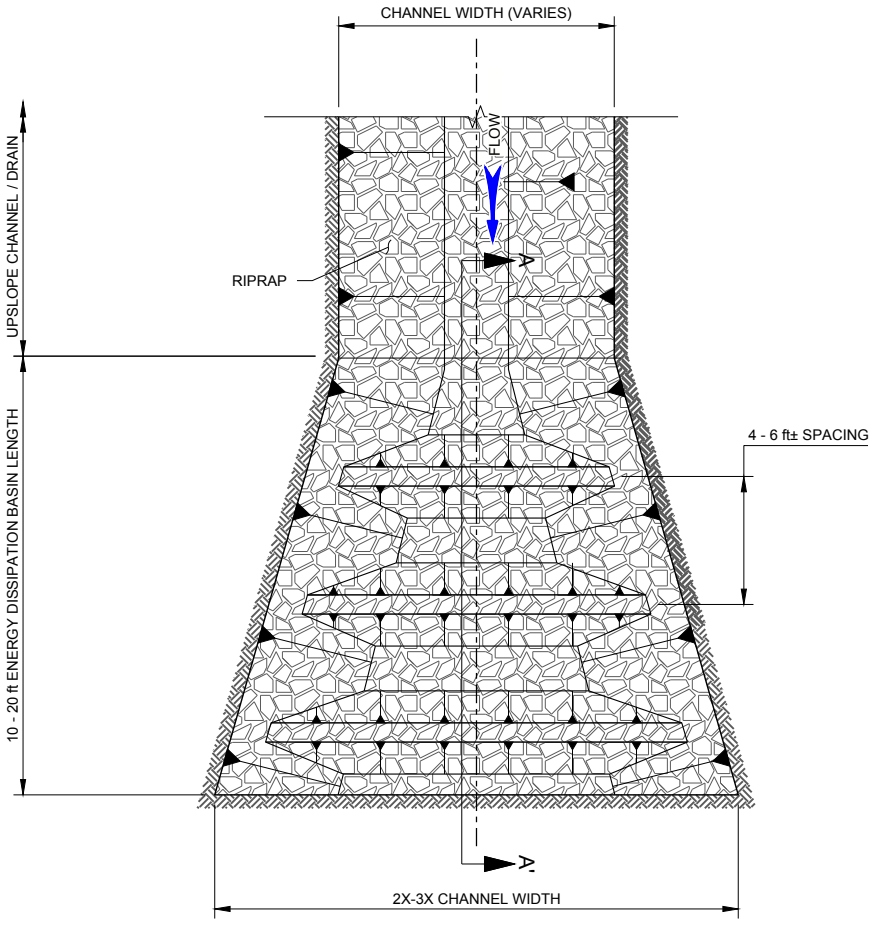
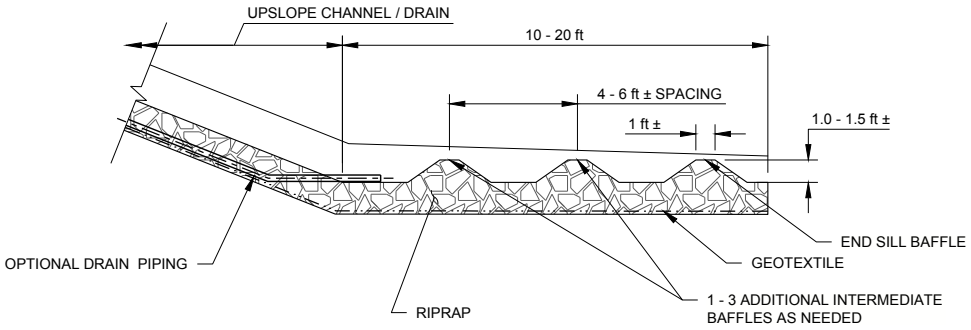
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TARGETED SEEP COLLECTOR

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1J





NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. ENERGY DISSIPATION BASIN SHOULD BE CONSTRUCTED AT THE DOWNSTREAM END OF CHANNELS AND DRAINS WHERE HIGH WATER VELOCITY MAY BE EXPECTED AND/OR DEBRIS MAY TRAVEL DOWN THE CHANNEL.
3. INTERMEDIATE BAFFLES SHOULD BE CONSTRUCTED AS NEEDED TO INTERCEPT DEBRIS FROM THE CHANNEL AND BELOW STEEP CHANNELS.

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PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

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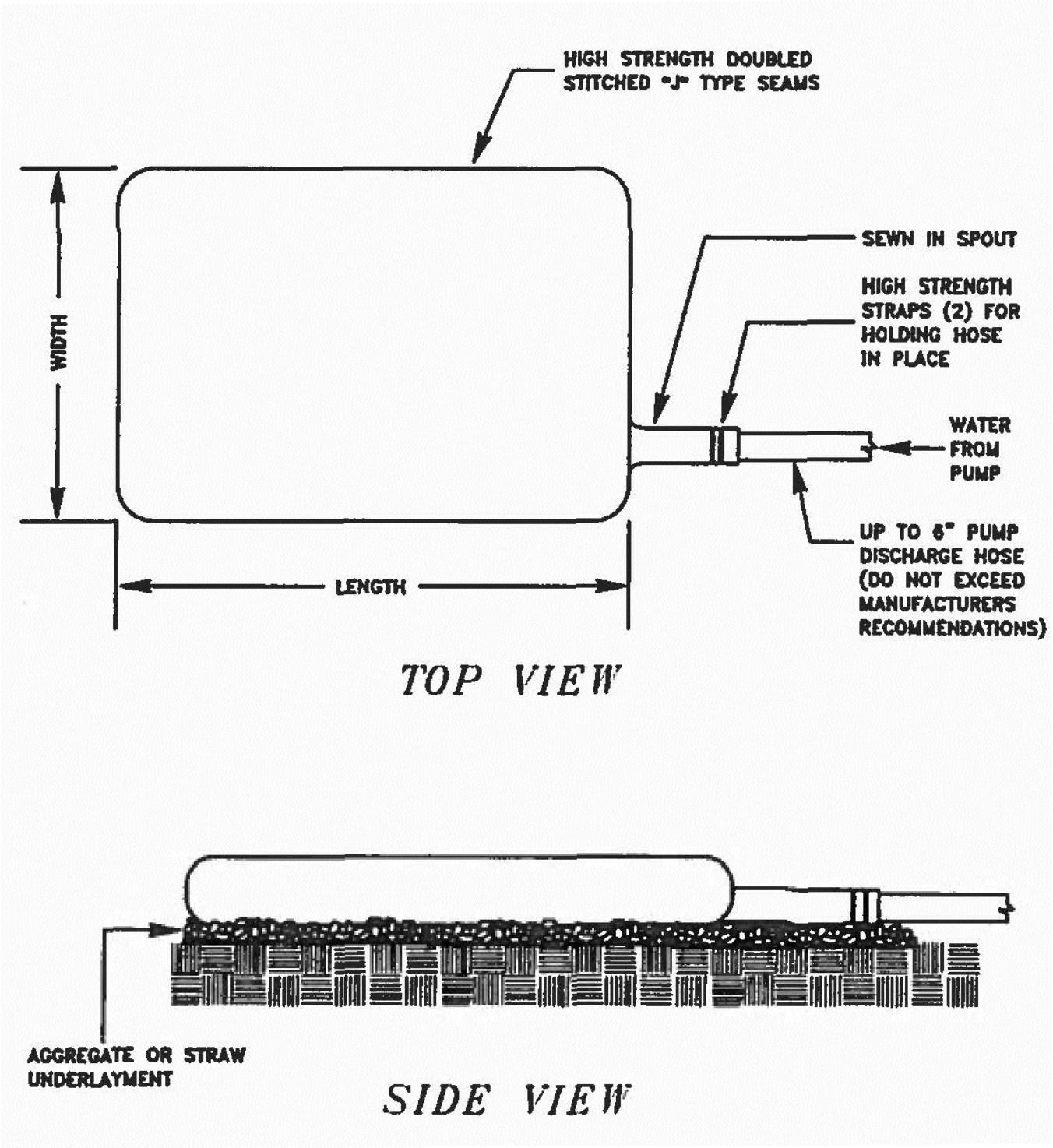
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ENERGY DISSIPATION BASIN

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1K



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DOMINION

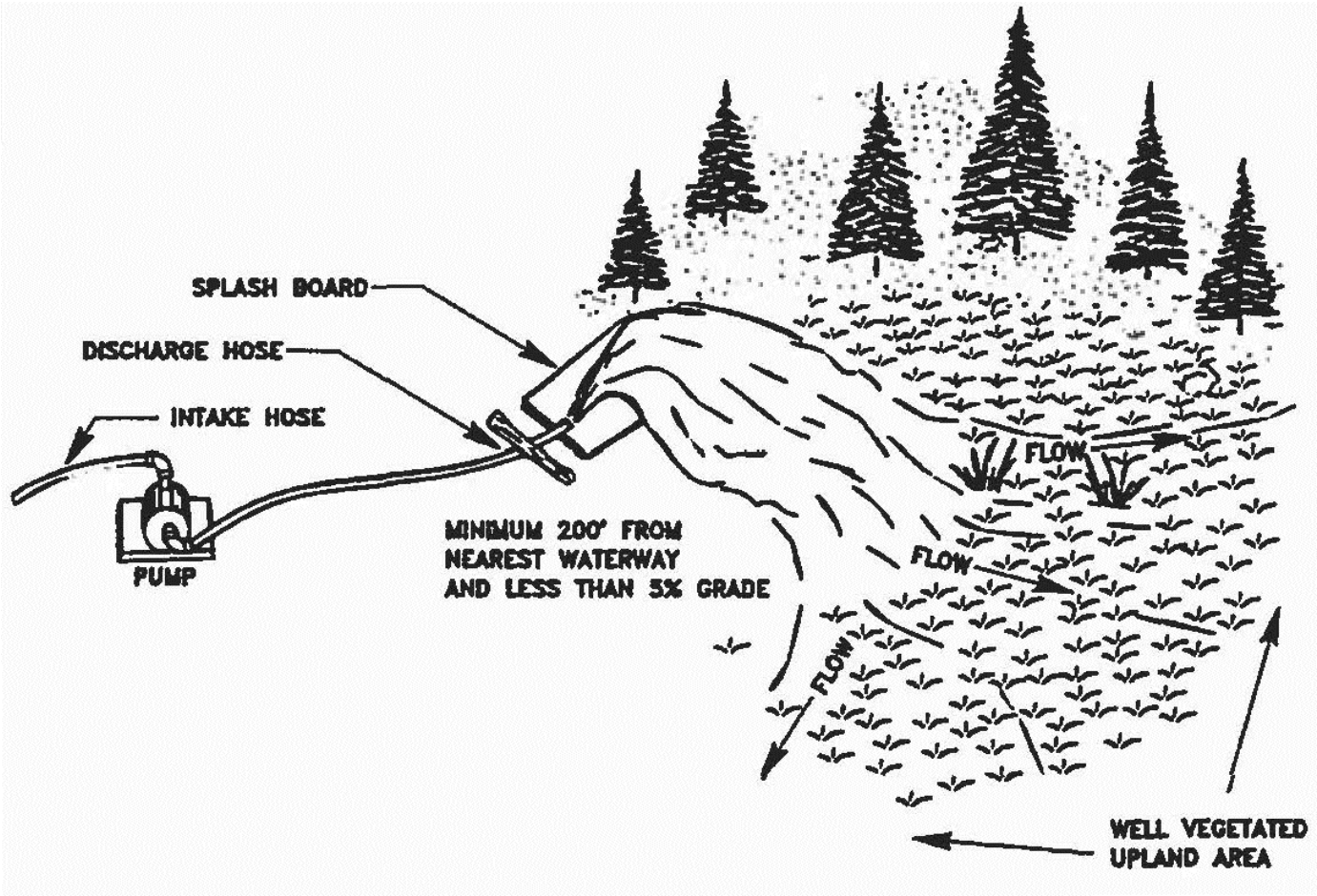
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
DEWATERING DISCHARGE BAG

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1L



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

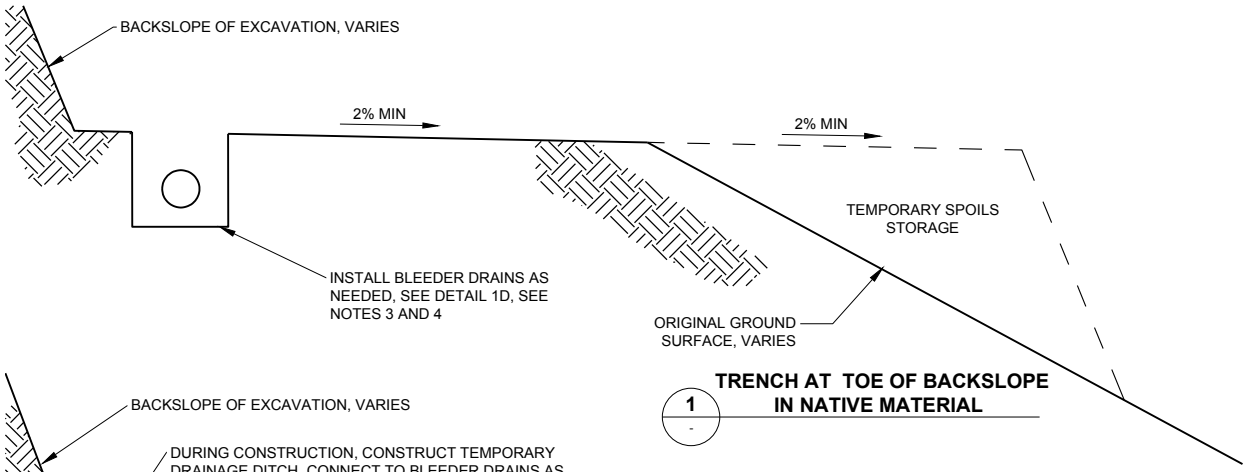
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

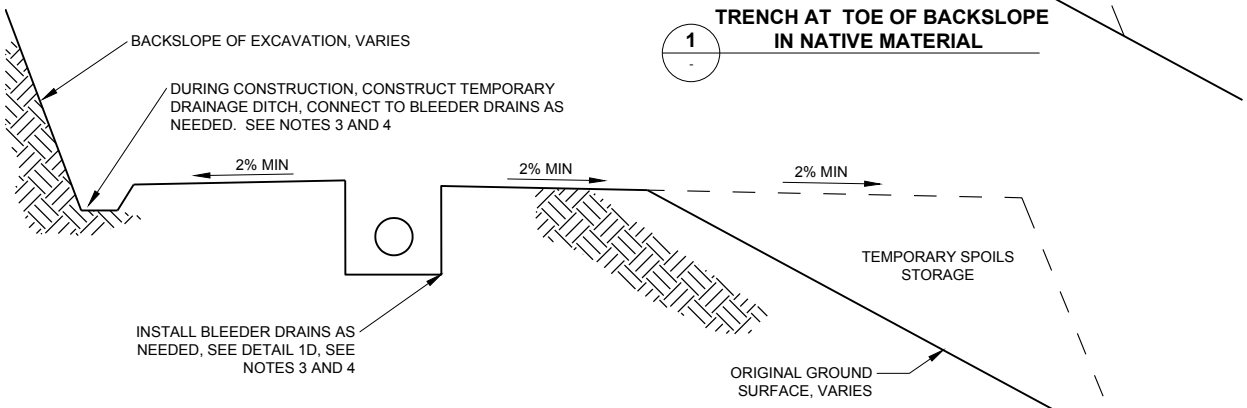
TITLE
DEWATERING DISCHARGE IN UPLAND AREA

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	1M

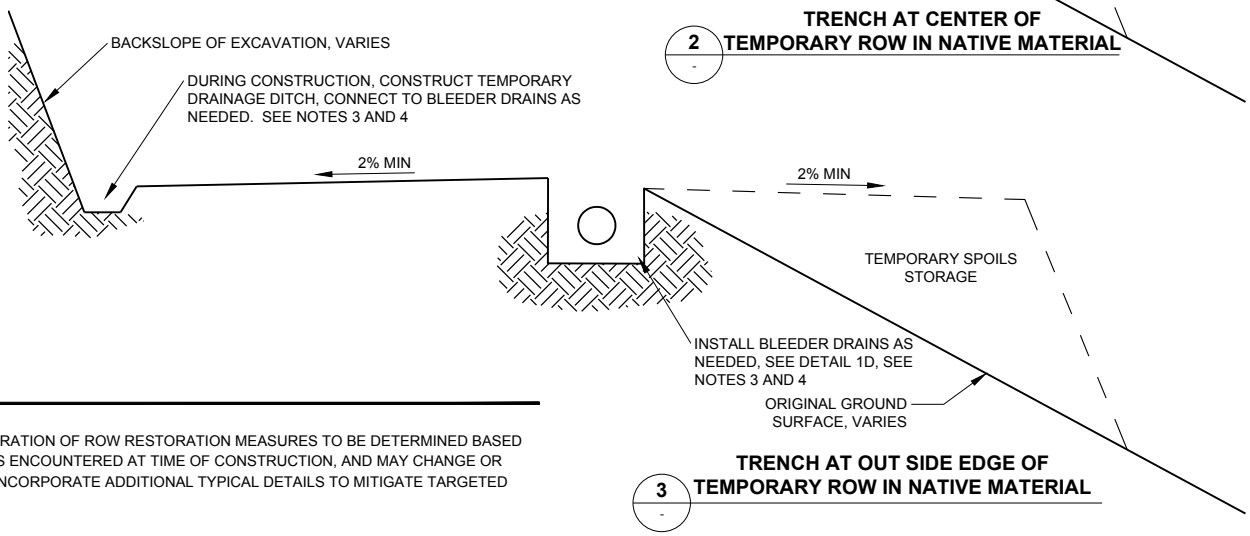
0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



1 - TRENCH AT TOE OF BACKSLOPE IN NATIVE MATERIAL



2 - TRENCH AT CENTER OF TEMPORARY ROW IN NATIVE MATERIAL



3 - TRENCH AT OUT SIDE EDGE OF TEMPORARY ROW IN NATIVE MATERIAL

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. THE TEMPORARY ROW SURFACE, WHEN IT IS INITIALLY CONSTRUCTED, ACTS AS A SURFACE THAT DIRECTS AND CONTROLS RUNOFF DURING CONSTRUCTION AS WELL AS CONTROLLING SEEPAGE AND SUBSURFACE FLOWS AFTER THE ROW IS RESTORED AND BACKFILLED. THEREFORE, CONSTRUCTION AND GRADING OF THE TEMPORARY ROW SURFACE SHOULD BE COMPLETED TO SO AS TO MAINTAIN POSITIVE DRAINAGE (I.E. APPROXIMATELY 2% SLOPE) AWAY FROM THE PIPELINE TRENCH, AND TO OUTBOARD SIDES OF THE ROW THAT DISCHARGE ONTO NATURAL SLOPES DIRECTED AWAY FROM THE ROW, SO THAT RUNOFF ON THE TEMPORARY ROW SURFACE DOES NOT ACCUMULATE OR POND.

3. FOR TEMPORARY CONSTRUCTION WORK PERIOD, WHERE THE TEMPORARY ROW SURFACE MUST SLOPE TO AN INSIDE AREA, WHERE ACCUMULATED RUNOFF CAN POND, THEN DRAINAGE MEASURES SHOULD BE IMPLEMENTED THAT COLLECT AND EVACUATE THE PONDED WATER DURING TEMPORARY CONSTRUCTION PERIODS AND FOR PERMANENT RESTORATION.

4. FOR PERMANENT RESTORATION, CONVERT TEMPORARY DRAINAGE DITCH TO FRENCH DRAINS AND/OR TARGETED SEEP COLLECTORS, AS NEEDED. SEE DETAILS 1A, 1C, 1D AND 1E.

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PROJECT
BIC/INCREMENTAL CONTROLS

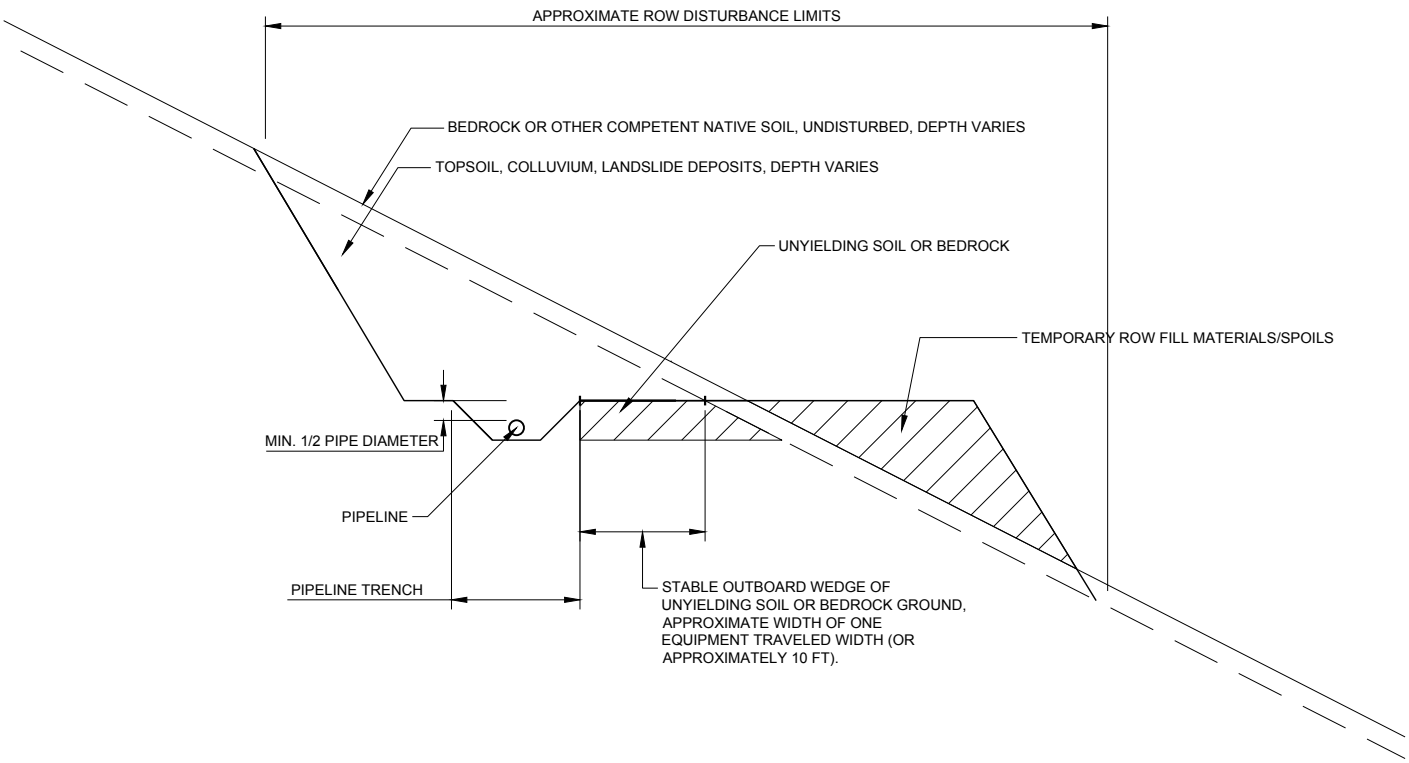
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
GRADING TEMPORARY ROW SURFACE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2A

0 1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

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DOMINION

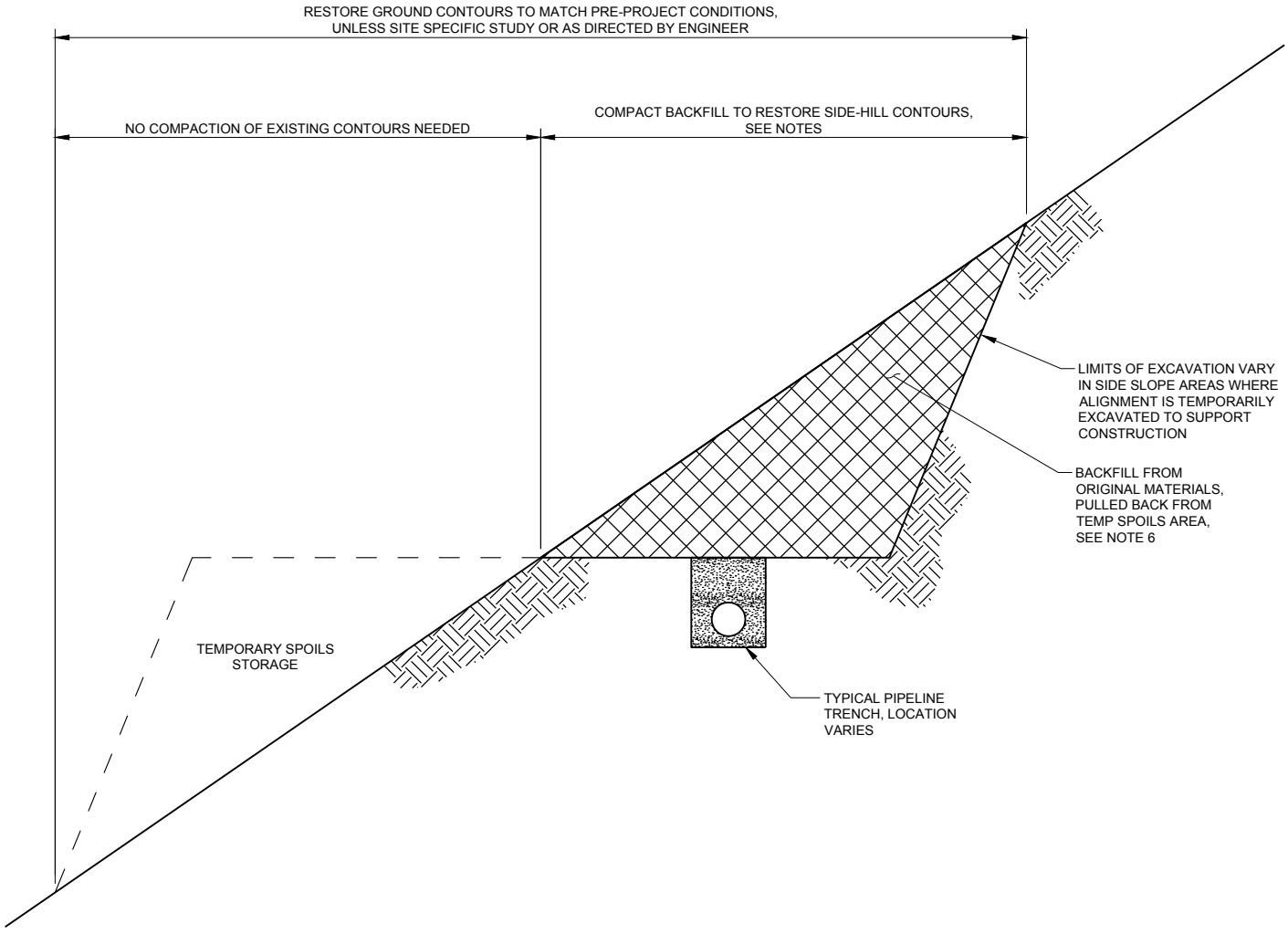
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
GRADING TRENCH WITH STABLE OUTBOARD WEDGE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2B



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. RECOMMEND COMPACTING SIDE SLOPE AREAS USING “SHEEP’S FOOT” COMPACTION EQUIPMENT IN HORIZONTAL LAYERS.
3. BACKFILL MATERIALS SHOULD BE AT OR NEAR OPTIMUM MOISTURE CONTENT (DRYING SOILS OR ADDING WATER AS NECESSARY), VISUALLY DETERMINED BY A COMPETENT ON-SITE REPRESENTATIVE. SEE TYPICAL DETAIL 2D FOR DRYING BACKFILL.
4. SOILS COMPACTION SHOULD BE COMPLETED IN LIFTS SUCH THAT BACKFILL MATERIALS ARE STABLE, SHED WATER AND DO NOT EASILY BECOME SATURATED, AND ARE AT APPROXIMATELY THE MAXIMUM DRY DENSITY, VISUALLY DETERMINED BY A COMPETENT ON-SITE REPRESENTATIVE.
5. ADDITIONAL COMPACTION REQUIREMENTS MAY APPLY AT ROAD CROSSINGS, AREAS IDENTIFIED BY THE ENGINEER, OR AT OTHER LOCATIONS AS MAY BE REQUIRED BY LAWS AND REGULATIONS. SEE TYPICAL DETAIL 2I FOR COMPACTION REQUIREMENTS ACROSS ROADS.
6. BACKFILL CONFIGURATION MAY VARY TO FIT SITE CONDITIONS, AND MAY BE USED IN OTHER ROW CROSS-SECTION BACKFILL GEOMETRIES, AS DIRECTED BY ENGINEER.

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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
COMPACT BACKFILL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2C

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. SATURATED ON-SITE SOILS MAY NEED TO BE DRIED BEFORE RE-USE AND PLACEMENT AS BACKFILL. DRYING MAY INCLUDE WIND-ROWING AND TURNING OVER IN FURROWS TO ALLOW FOR AIR EXCHANGE AND EVAPORATION TO DRY THE MATERIALS, OR ADDITION OF ADD-MIXTURES TO DRY THE SOILS.

3. THE USE OF ADD-MIXTURES TO SATURATED SOILS SHOULD BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO USE.

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BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
DRY SOILS AND BACKFILL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2D

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. WHERE THE PLACEMENT OF SPOILS ON THE SITE MAY INITIATE OR EXACERBATE LANDSLIDES OR RESULT IN SLOPE INSTABILITY, THE MATERIALS SHOULD BE REMOVED FROM THE SITE AND SPOILED AT A SAFE AND OFF-SITE LOCATION.

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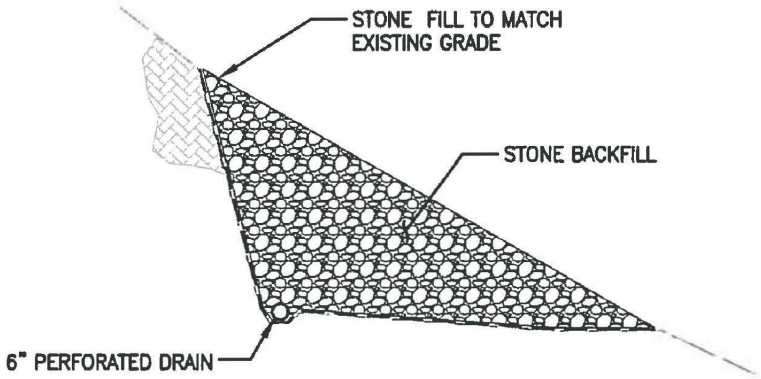
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

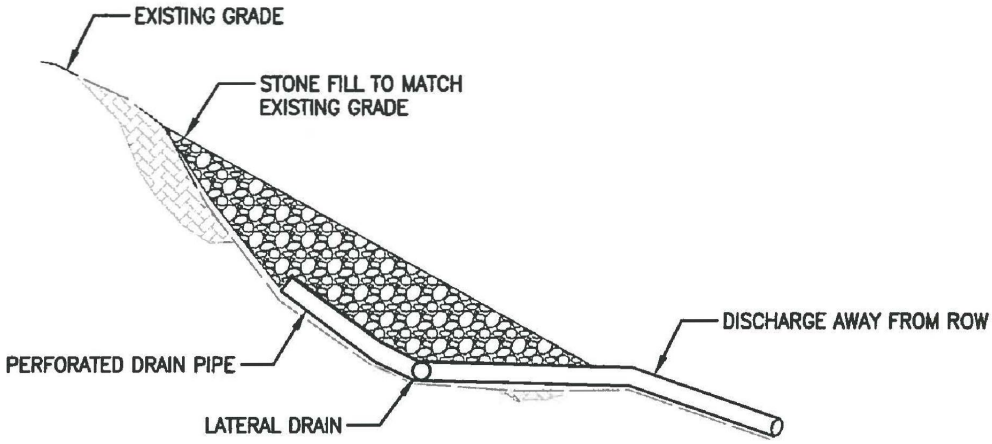
TITLE
REMOVE UNSUITABLE EXISTING SOILS AS BACKFILL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2E



STONE WITH DRAIN TO RESTORE FAILING SLOPE

N.T.S.



SMALL SLIP REPAIR WITH LATERAL

N.T.S.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ROCK BACKFILL (WITH DRAIN)

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2F

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. RESTORATION OF ROW SURFACES SHOULD GENERALLY RE-CONSTRUCT THE GROUND SURFACE TO MATCH THE PRE-PROJECT CONTOURS.

3. CHANGES IN THE FINAL GRADING MAY BE NEEDED TO ADDRESS SPECIFIC TARGETED GEOTECHNICAL OR HYDROTECHNICAL OR GEOLOGIC ENGINEERING ISSUES (I.E. CORRECT DRAINAGE PROBLEMS, MINIMIZE DELIVERY OF WATER TO LANDSLIDE SITES, ETC.).

4. FINAL GRADING TO BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO COMPLETION.

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BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
GRADING TO MATCH EXISTING CONTOURS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2G

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. MINIMIZE THE PLACEMENT OF BACKFILL MATERIALS WHEN RESTORING AND RE-CONSTRUCTING LANDSLIDE SITES, IN ORDER TO REDUCE THE IMPOSED LOAD ON LANDSLIDE SITES.

3. MINIMIZE THE PLACEMENT OF SPOILS FROM GRADING WORK IN OTHER AREAS ALONG THE ROW THAT MAY OVERLAP OTHER LANDSLIDES, IN ORDER TO REDUCE THE POTENTIAL FOR INITIATING NEW LANDSLIDES.

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PROJECT
BIC/INCREMENTAL CONTROLS

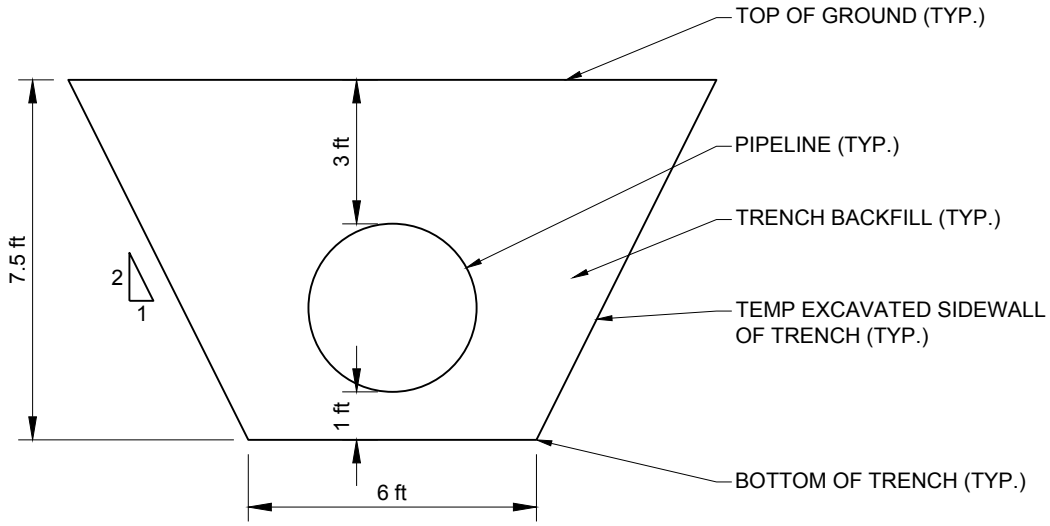
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
GRADING TO MINIMIZE BACKFILL OVER LANDSLIDE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2H



NOT TO SCALE

NOTE(S)

1. REFER TO CONTRACT SPECIFIC REQUIREMENTS, FOR TYPICAL GRADING, BACKFILL, AND TRENCHING.

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PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYPICAL TRENCH DIMENSION IN GENERALLY FLAT TERRAIN

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2I

NOTE(S)

1. DEVELOP SPOILS MANAGEMENT PLAN THAT FITS THE SITE SPECIFIC CONDITIONS, AND MEETS THE PURPOSE OF THE DESIGN AND CONSTRUCTION PLANS FOR THE TARGETED SITE. THE FOLLOWING ARE INTENDED ONLY AS GENERAL GUIDELINES, TO BE CONSISTENT WITH THE SITE SPECIFIC PLAN. ADDITIONAL MEASURES ARE ANTICIPATED.

2. MINIMIZE THE PLACEMENT OF SPOILS FROM GRADING WORK IN OTHER AREAS ALONG THE ROW THAT MAY OVERLAP OTHER POTENTIAL UNSTABLE GROUND, IN ORDER TO REDUCE THE POTENTIAL FOR INITIATING NEW SLOPE INSTABILITIES.

3. MINIMIZE THE PLACEMENT OF SPOILS MATERIALS WHEN RESTORING AND RE-CONSTRUCTING THE ROW, IN ORDER TO REDUCE THE IMPOSED LOAD ON POTENTIALLY UNSTABLE GROUND SITES.

4. EXAMPLE SPOILS MANAGEMENT MEASURES MAY INCLUDE, BUT ARE NOT LIMITED TO: STACKING SPOILS ALONG THE ROW EDGE IN DRY CONDITIONS AND WITHIN ROW OR TEWA BOUNDARIES; USE TEMPORARY PILES AND MATS TO CREATE CRIBS .TO RETAIN SPOILS; USE LOCAL LARGE BOULDERS TO BUILD TEMPORARY CRIBS TO RETAIN SPOILS; BUILD TEMPORARY PIONEER ROADS OR EXCAVATED BERMS TO RETAIN SPOILS; SHORT-HAUL OR END-HAUL SPOILS TO OFF-SITE LOCATIONS FOR TEMPORARY STORAGE OR SPOILS; STACK SPOILS IN TRAVELED WAY TO TEMPORARILY STORE; COVER SPOILS WITH PLASTIC AND/OR GEOSYNTHETIC MATERIALS; ENCASE SPOILS IN GEOSYNTHETIC MATERIALS TO IMPROVE STABILITY OF SPOILS FOR TEMPORARY STORAGE.

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PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

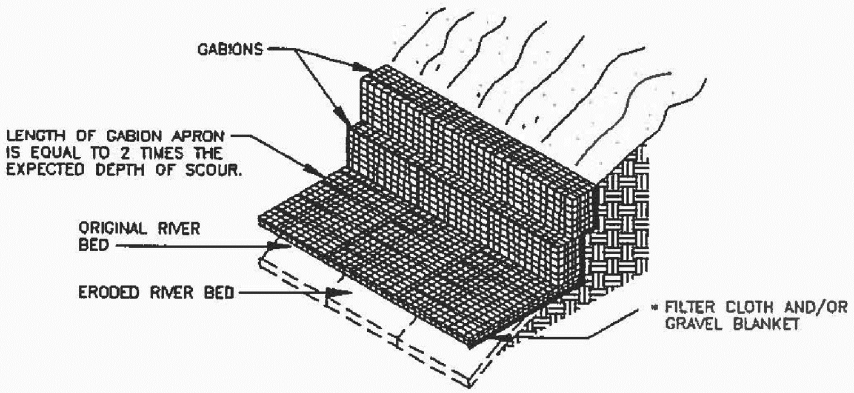
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SPOILS MANAGEMENT

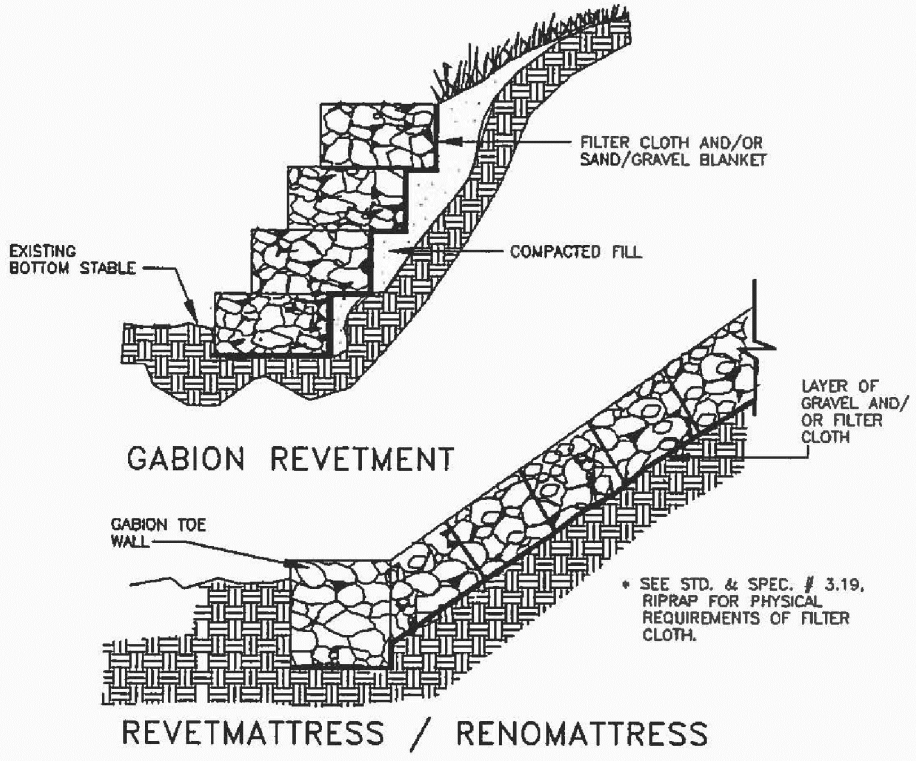
PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2J

0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

GABIONS



GABION TOE WALL



GABION REVETMENT

REVETMATTRESS / RENOMATTRESS

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATIONS MEASURES TO BE DETERMINED BASED ON CONDITION ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

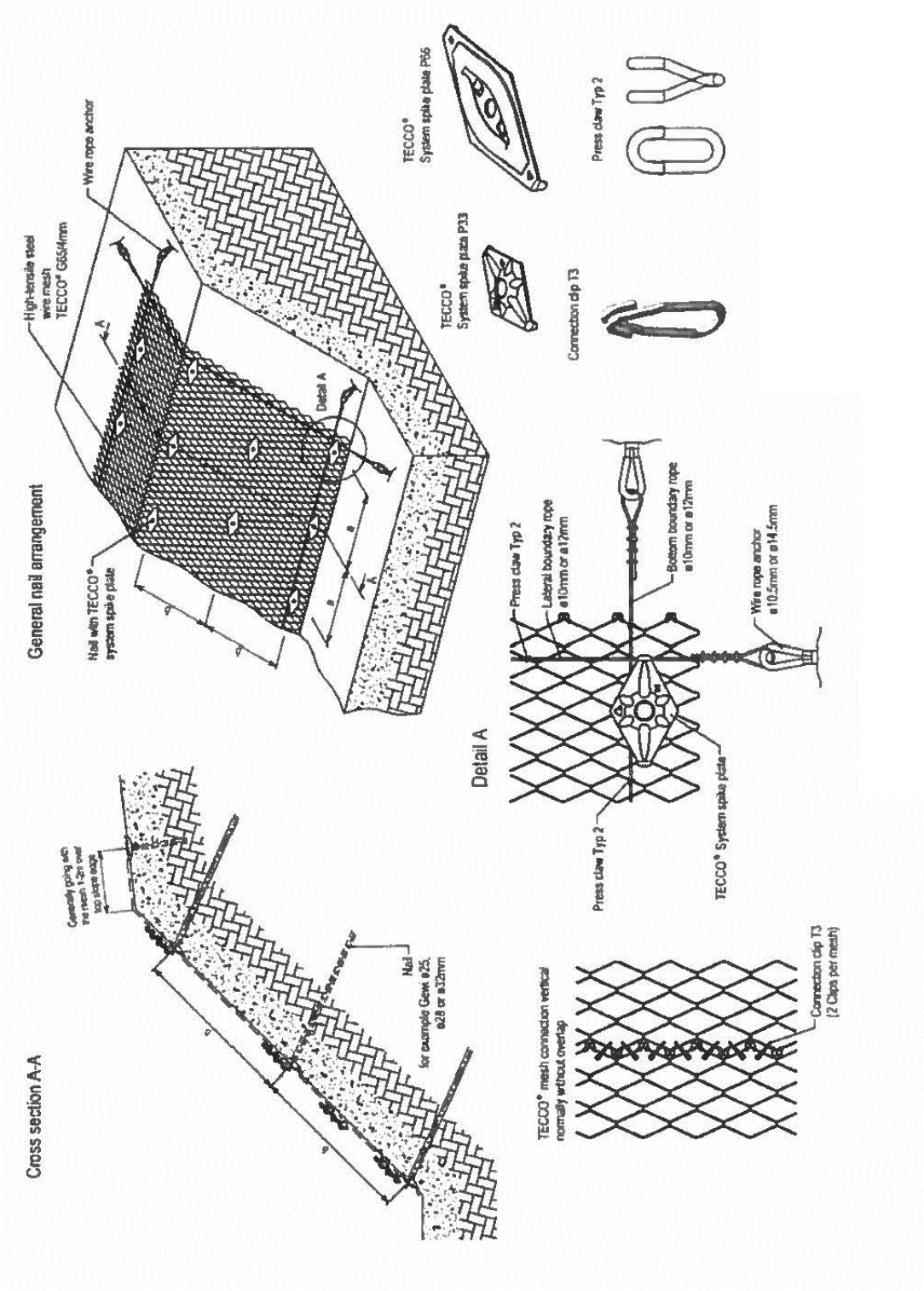
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
GABIONS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2K



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATIONS MEASURES TO BE DETERMINED BASED ON CONDITION ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SOIL-NAIL WITH TECCO MESH

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2L

0 1m
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

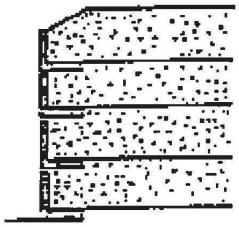
TITLE
EXTERNALLY STABILIZED RETAINING WALL SYSTEMS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2M

0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

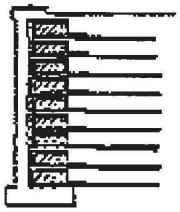
A) VERTICAL GEOTEXTILE FACING

E) SLOPING GEOTEXTILE FACING



B) VERTICAL PRECAST CONCRETE ELEMENT FACING

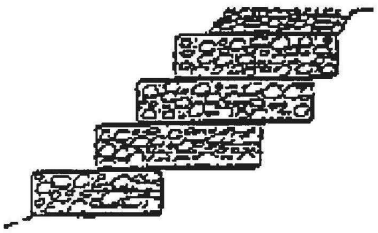
F) SLOPING GUNITE OR STRUCTURAL FACING



C) VERTICAL CAST IN-PLACE CONCRETE/MASONRY FACING

G) SLOPING SOIL AND VEGETATION FACING

D) VERTICAL MASONRY FACING



H) GEOTEXTILE GABION

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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

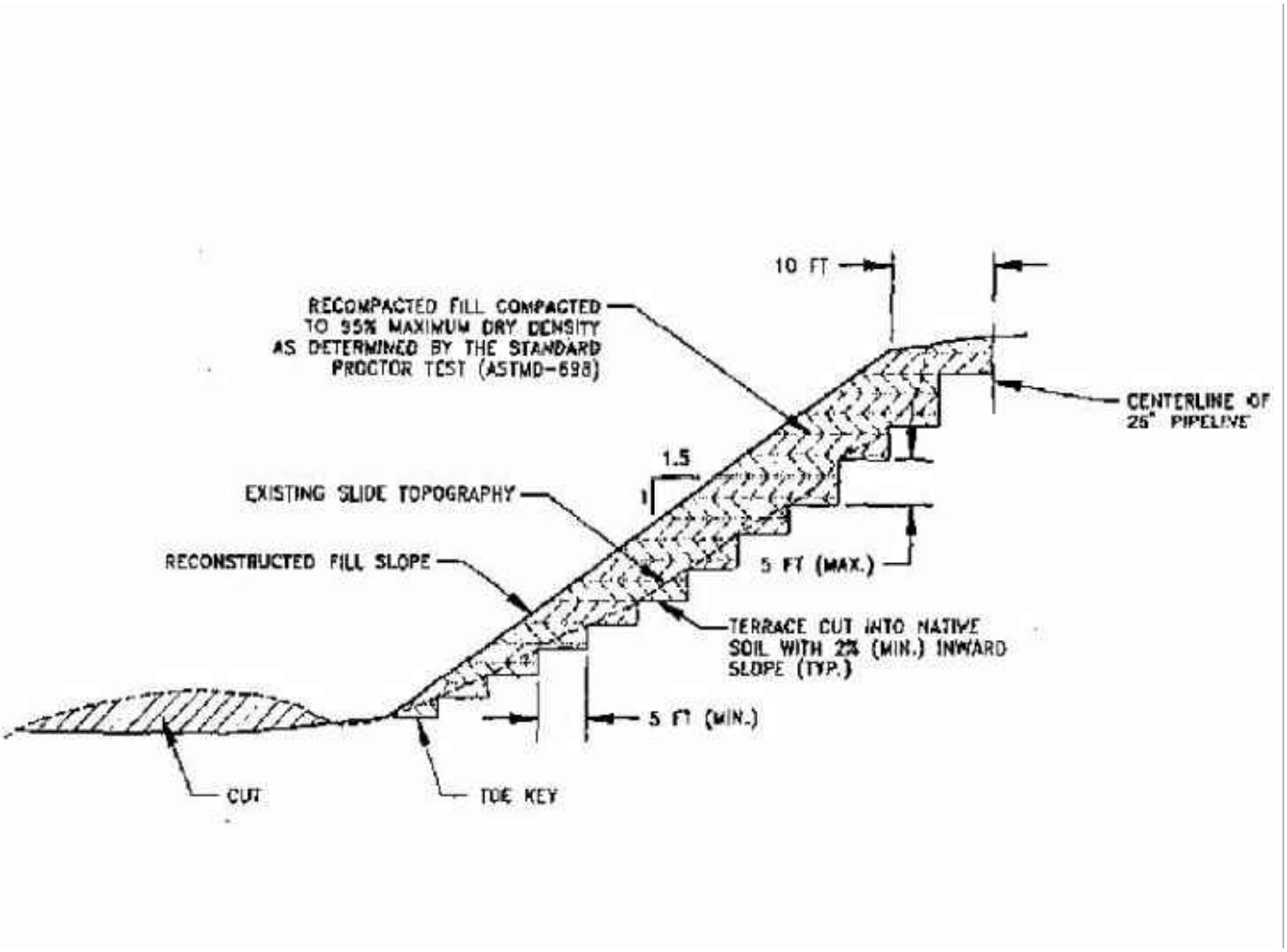
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
GEOTEXTILE REINFORCED SYSTEMS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2N



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

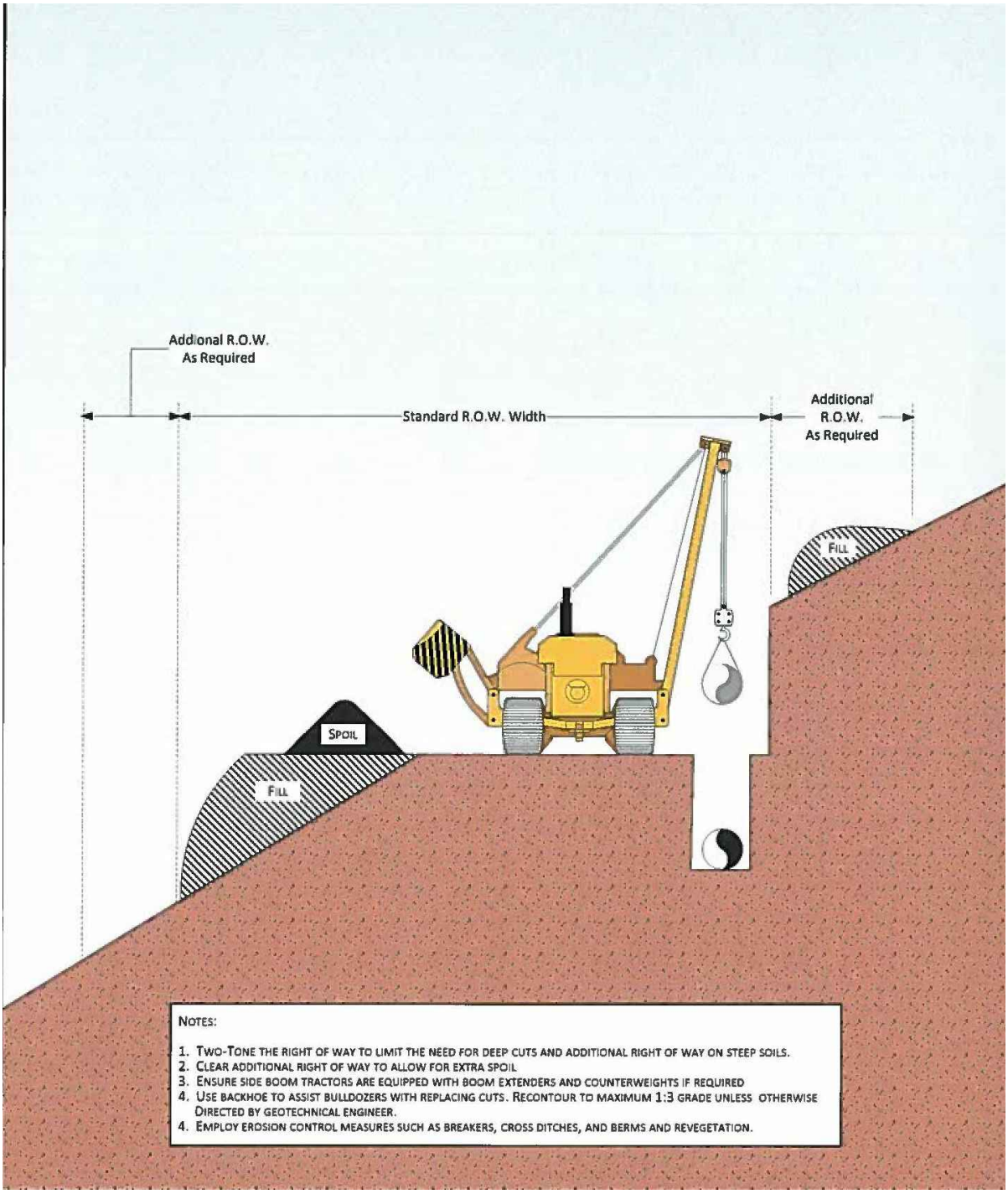
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
BENCH AND REGRADE WITH BACKFILL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	20



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

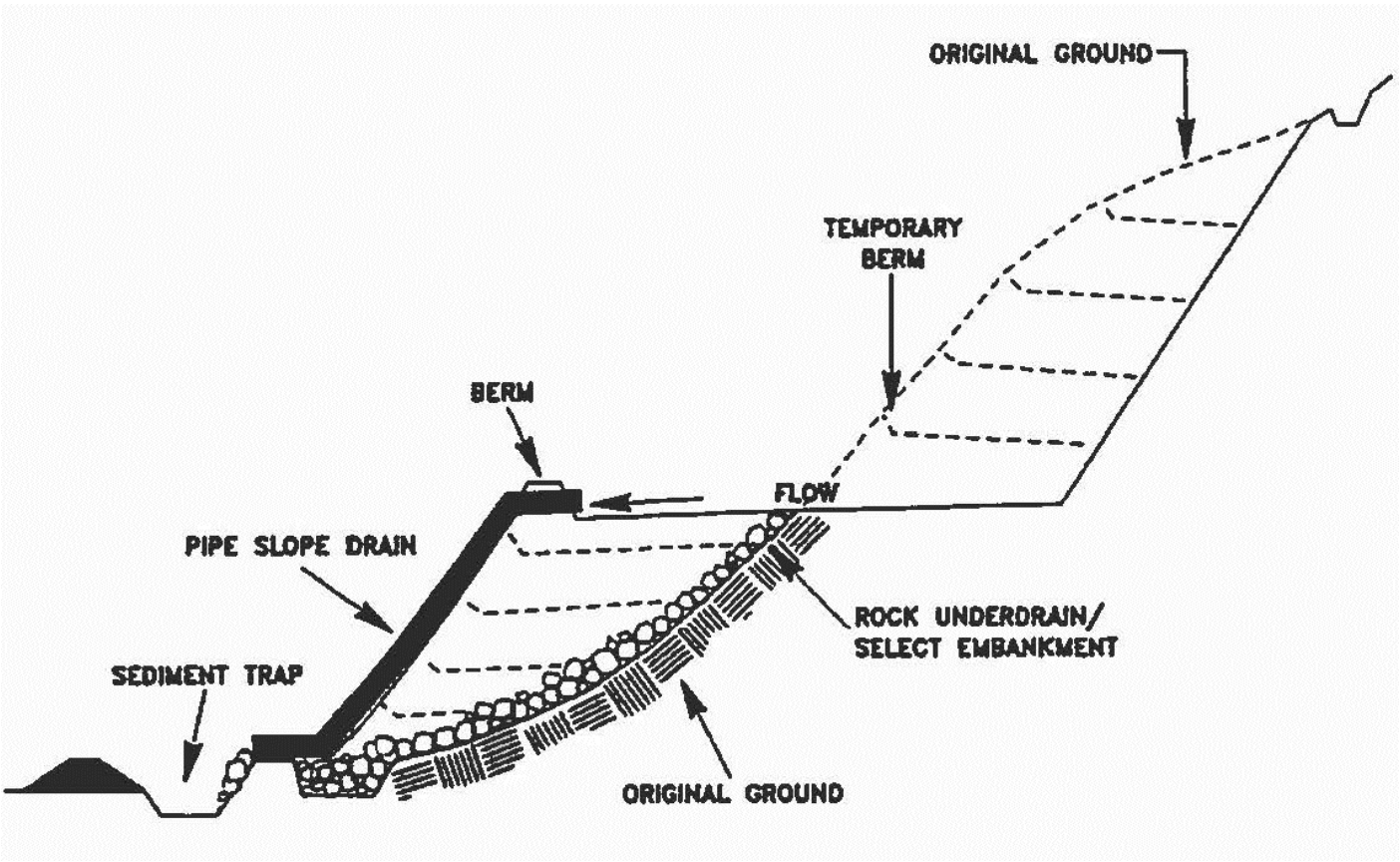
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
CUT AND FILL CONSTRUCTION

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2P



CLIENT
DOMINION

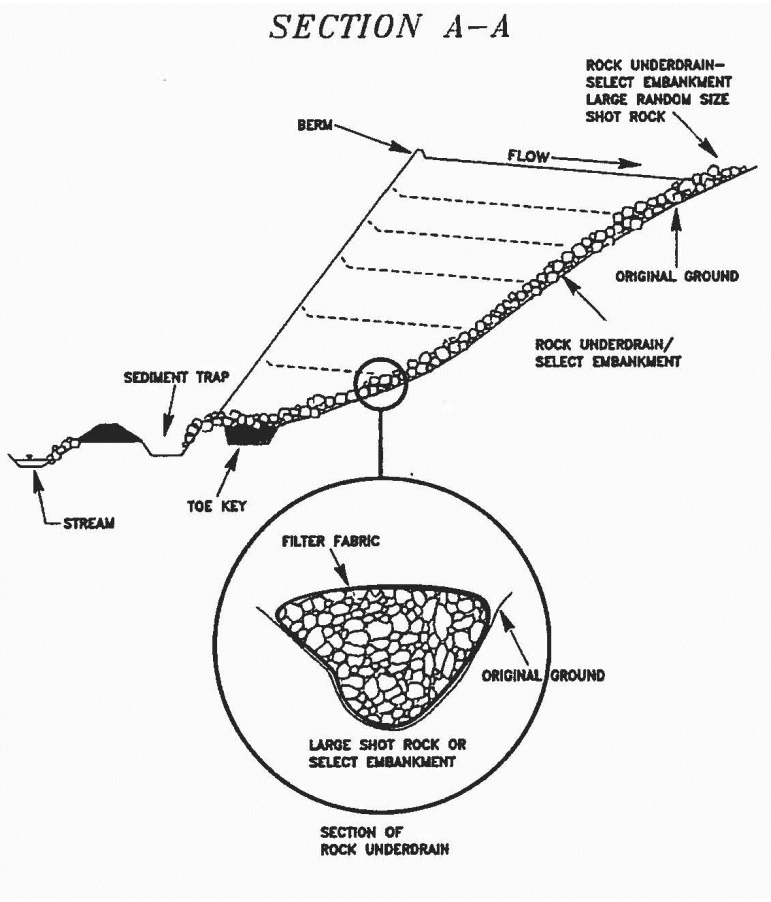
PROJECT
BIC/INCREMENTAL CONTROLS

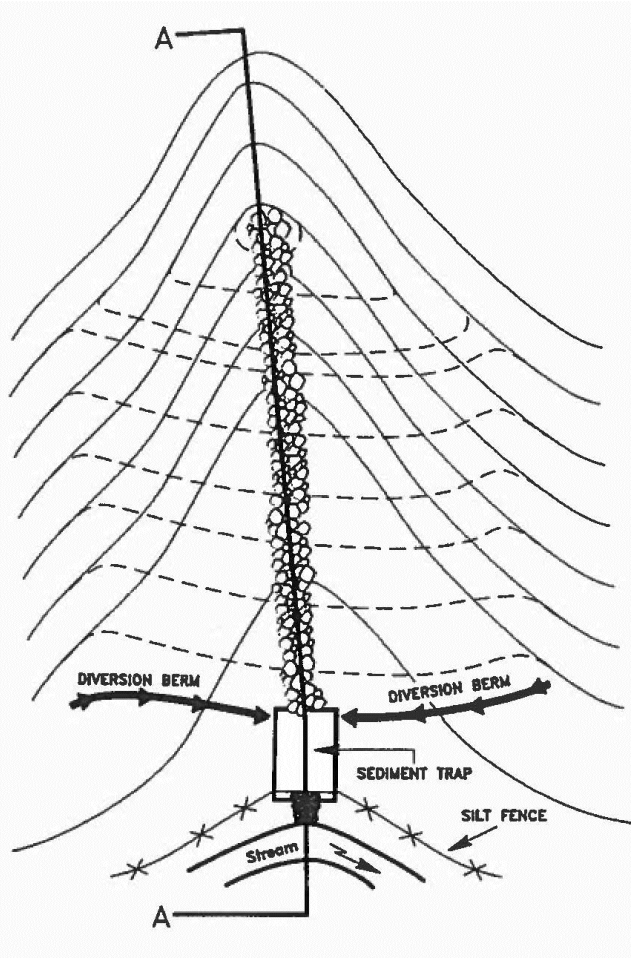
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP SIDE HILL CUT AND FILL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2Q





CLIENT
DOMINION

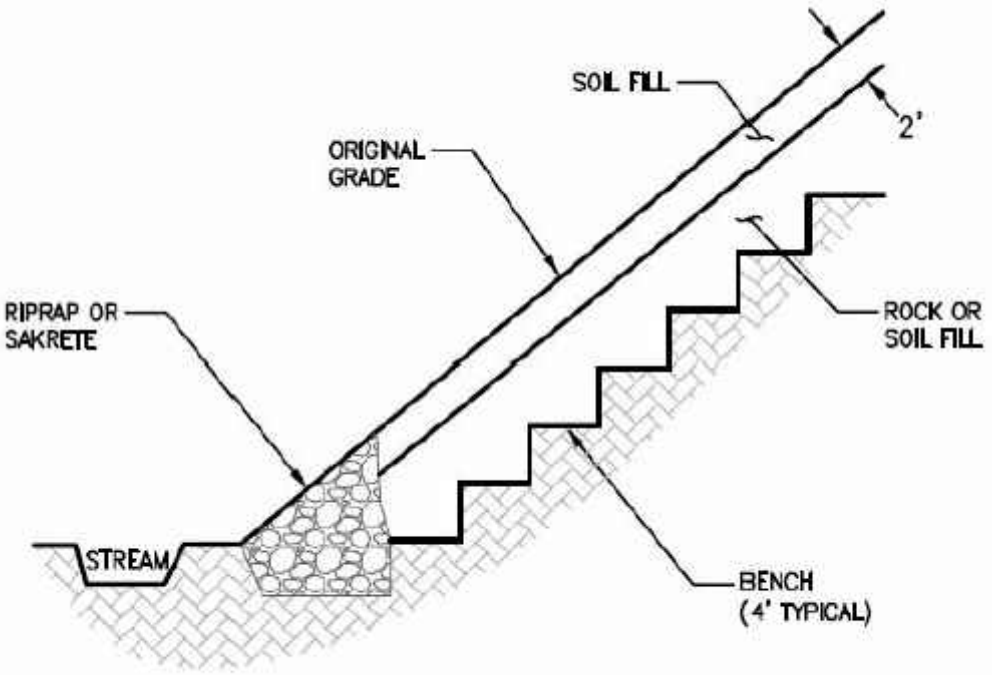
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

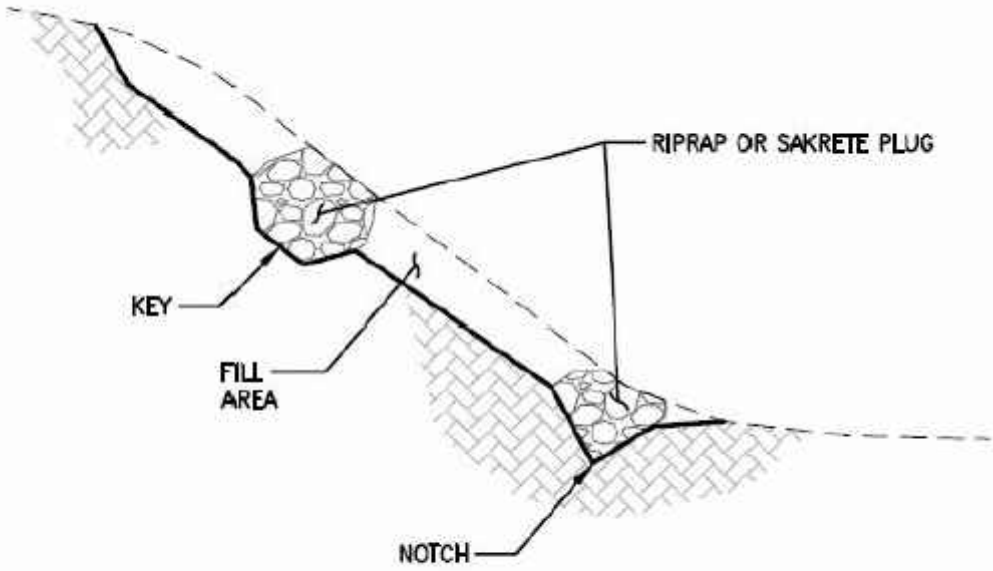
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP FILL WITH ROCK UNDER DRAIN

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2R



BENCH AND REGRADE TYPICAL
N.T.S.



KEYING TYPICAL
N.T.S.

CLIENT
DOMINION

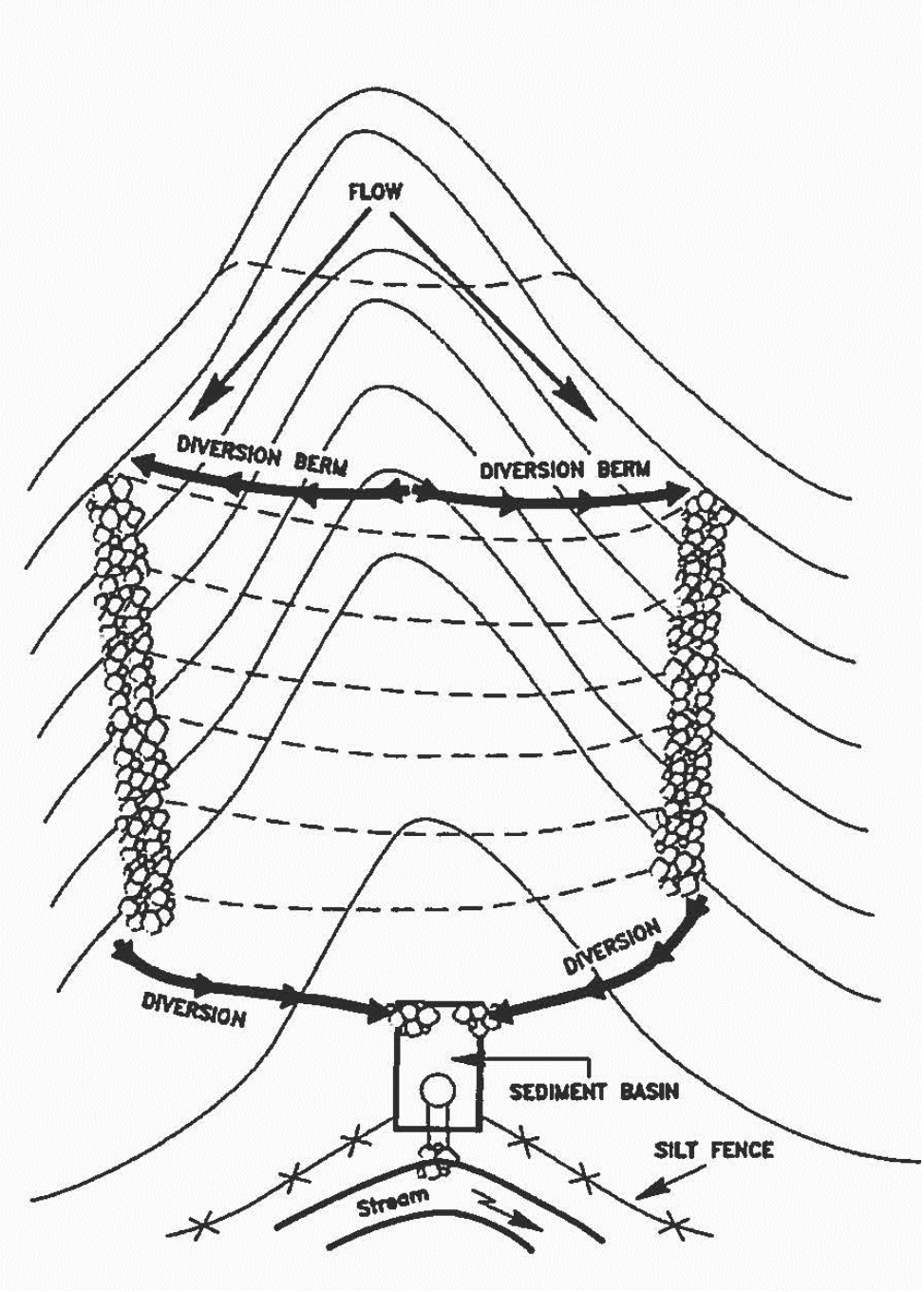
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP BENCH AND REGRADE BACKFILL WITH ROCK OR SACKCRETE KEYS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2S



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

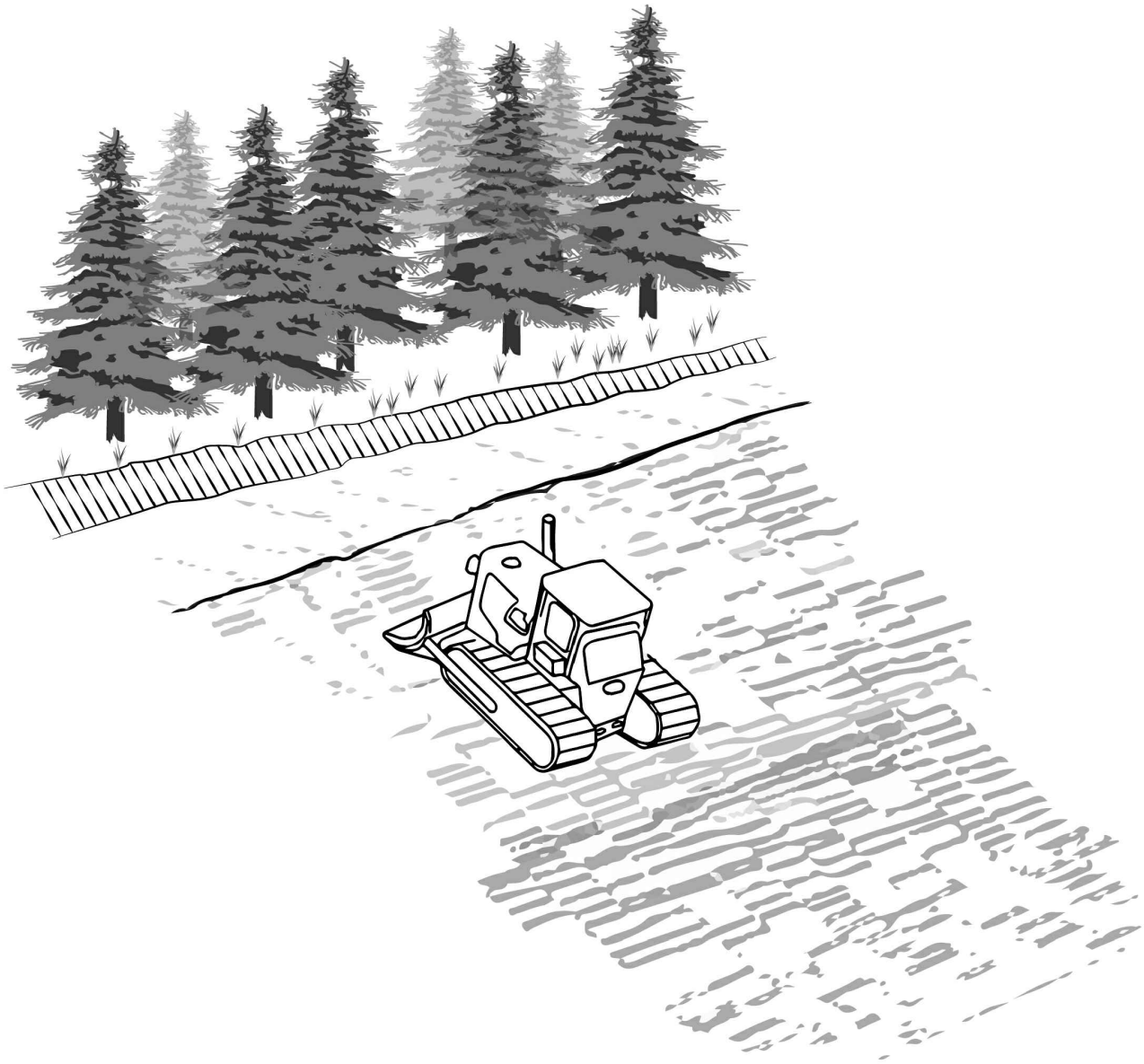
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP FILL WITH MULTIPLE ROCK CHANNELS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	2T



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. TRACKING SLOPES IS DONE BY RUNNING TRACKED MACHINERY UP AND DOWN THE SLOPE, LEAVING TREAD MARKS PERPENDICULAR TO THE SLOPE.
3. IF A BULLDOZER IS USED, THE BLADE MUST BE UP.
4. CARE SHOULD BE EXERCISED ON SOILS HAVING HIGH CLAY CONTENT TO AVOID OVER COMPACTION.

NOT TO SCALE

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TRACK DISTURBED SLOPES

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	3A

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. RE-VEGETATE DISTURBED SLOPES WITH NATIVE GRASS SEED MIX PER REGULATORY AND PERMIT REQUIREMENTS.
3. FINAL SEED MIX TO BE REVIEWED AND APPROVED BY ENGINEER PRIOR TO INSTALLATION.
4. GENERAL APPROACH CONSISTS OF, MAY INCLUDE, BUT IS NOT LIMITED TO, TEMPORARY SEEDING FOLLOWED BY PERMANENT SEEDING.
5. TEMPORARY SEEDING CONSISTS OF SEEDING AND MULCHING, OR MATTING USED TO PRODUCE A QUICK GROUND COVER TO REDUCE EROSION ON EXPOSED AND/OR DISTURBED SOIL THAT MAY BE REDISTURBED OR PERMANENTLY STABILIZED AT A LATER DATE. SELECT PLANTS APPROPRIATE TO THE SEASON AND SITE CONDITIONS, PER DOMINION SPECIFICATIONS AND CONTRACT REQUIREMENTS.
6. PERMANENT SEEDING ESTABLISHES PERENNIAL VEGETATION COVER ON EXPOSED AND/OR DISTURBED SOILS TO REDUCE EROSION AND DECREASE SEDIMENT YIELD FROM DISTURBED AREAS. SELECT PLANTS APPROPRIATE TO THE SEASON AND SITE CONDITIONS, PER DOMINION SPECIFICATIONS AND CONTRACT REQUIREMENTS.

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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

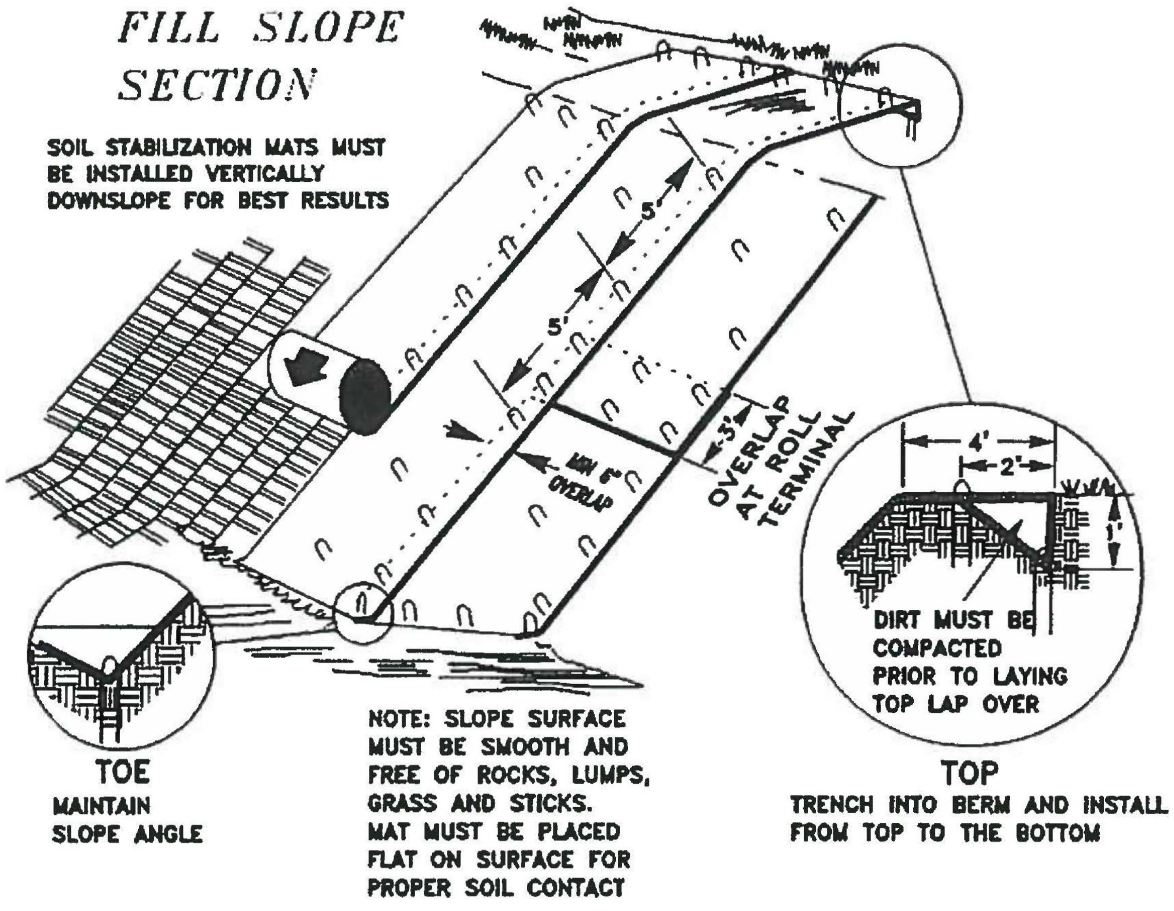
CONSULTANT

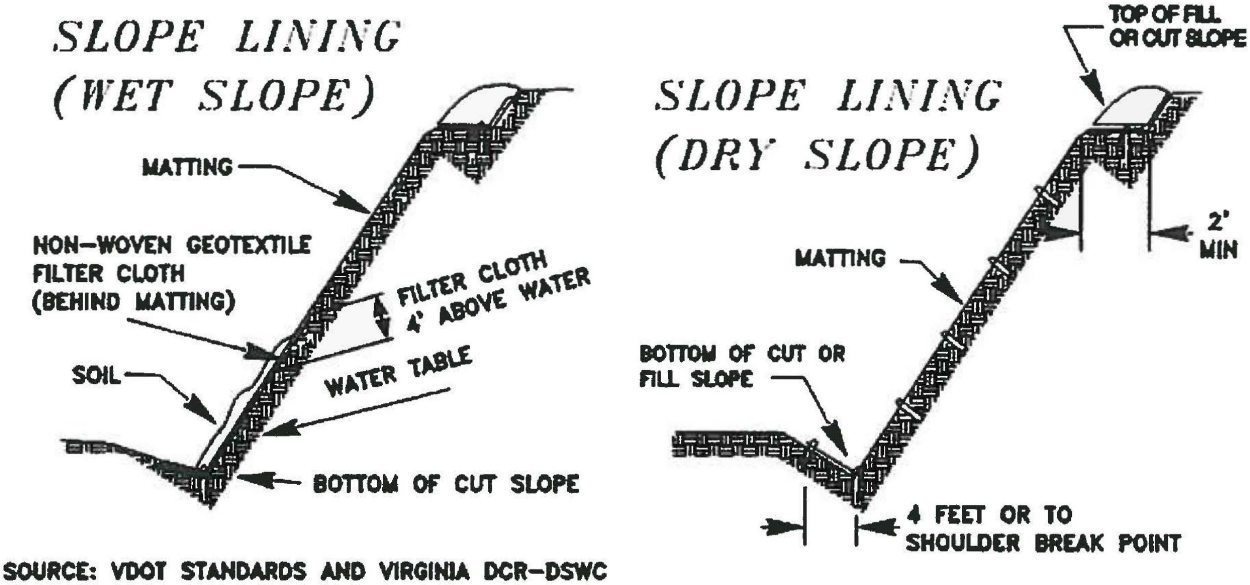
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
RE-VEGETATE DISTURBED SLOPES

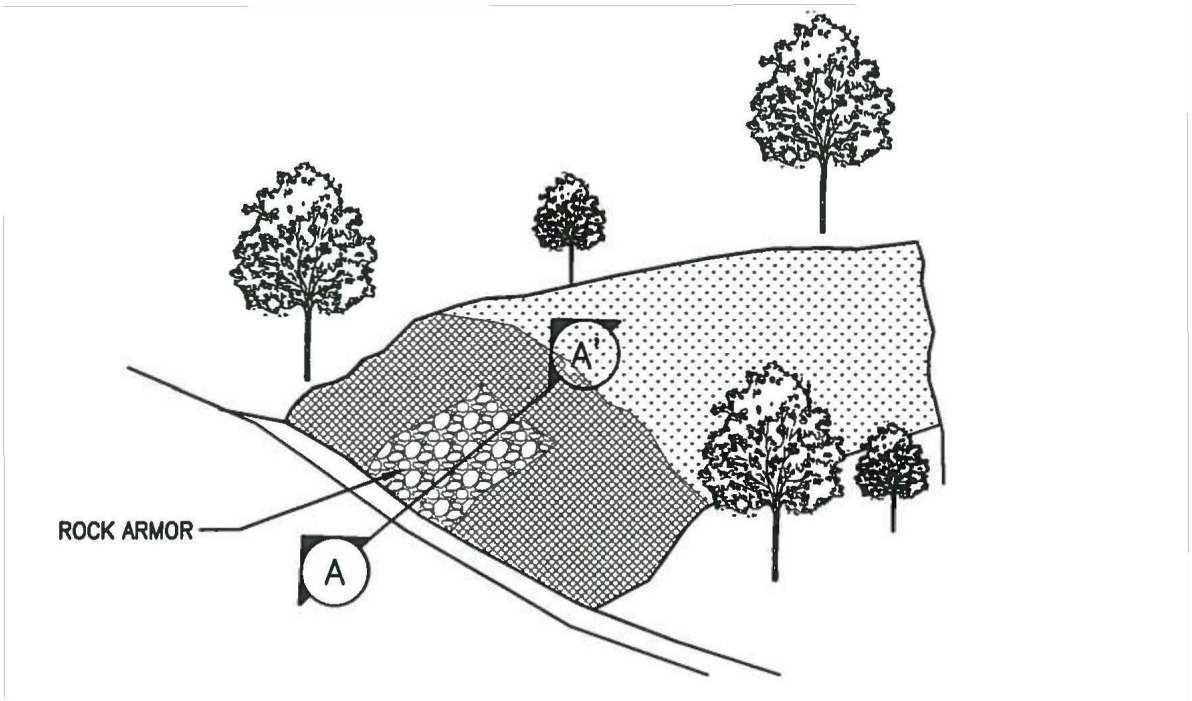
PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	3B



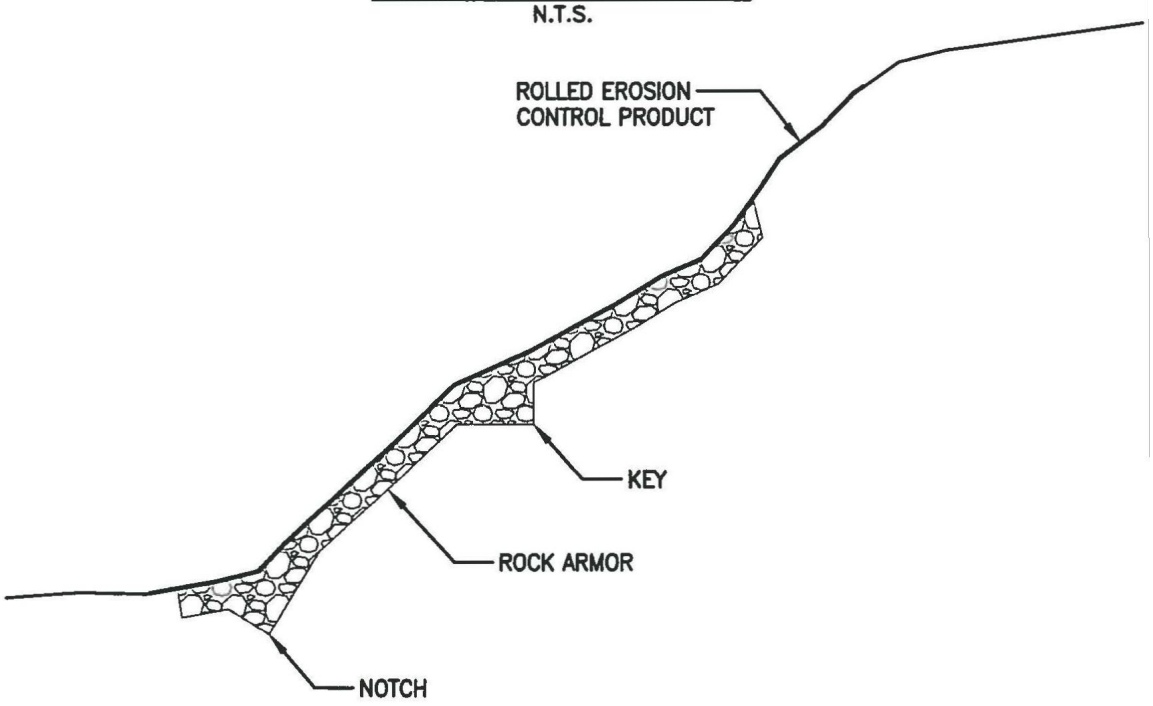


SOURCE: VDOT STANDARDS AND VIRGINIA DCR-DSWC

CLIENT: DOMINION		PROJECT: BIC/INCREMENTAL CONTROLS	
CONSULTANT: Golder Associates	YYYY-MM-DD: 2017-02-28	TITLE: **COIR CLOTH ON DISTRUBED SLOPES**	
	PREPARED: REDMOND		
	DESIGN: DBC		
	REVIEW: -		
	APPROVED: AQK	PROJECT No.: 1535050	PHASE: 500
		Rev.: F	FIGURE: 3C



PERSPECTIVE VIEW
N.T.S.



A–A' ROCK ARMOR ON STEEP SLOPE
N.T.S.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

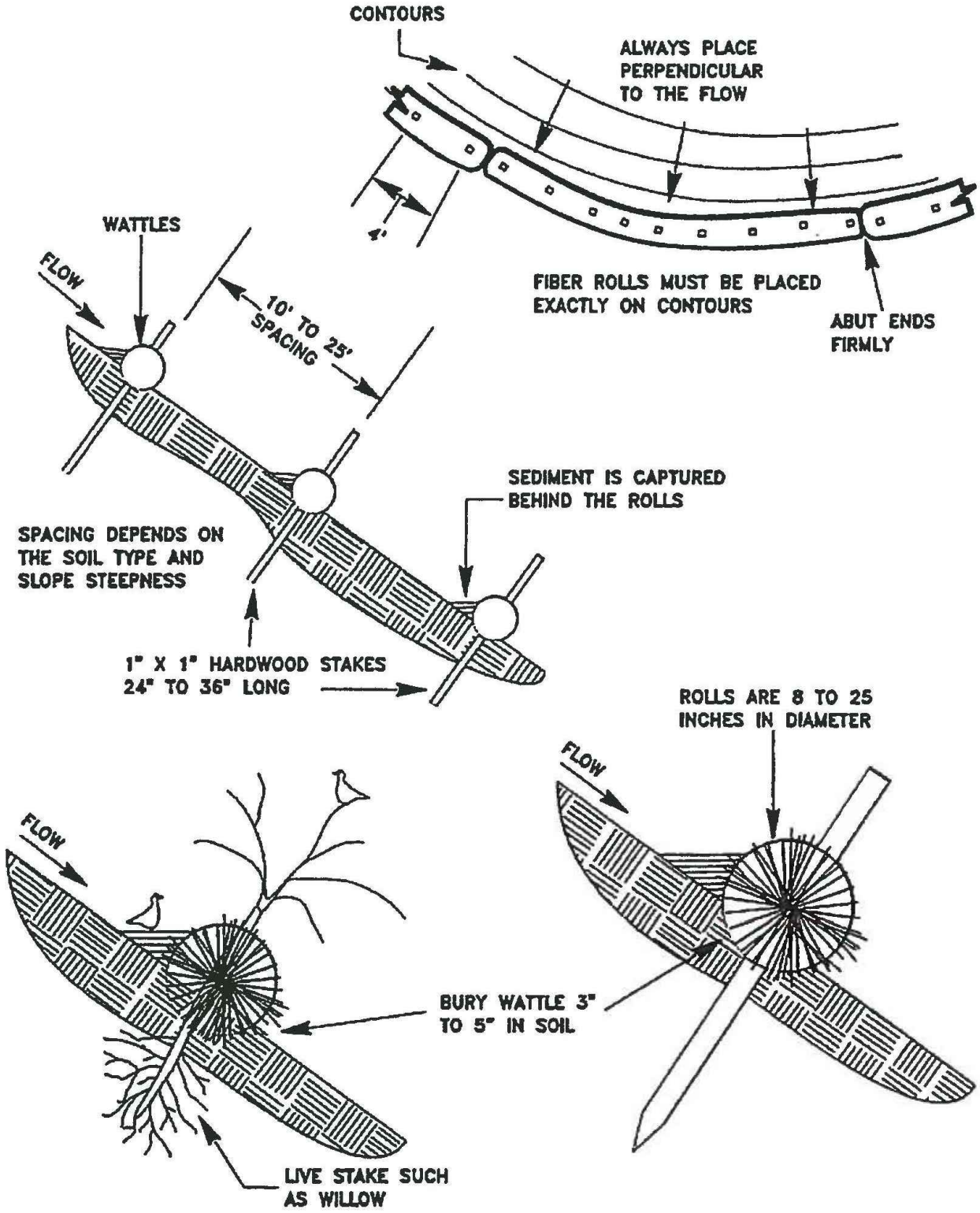
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ROCK ARMORING ON DISTRUBED SLOPES

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	3D

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
0 1in



CLIENT
DOMINION

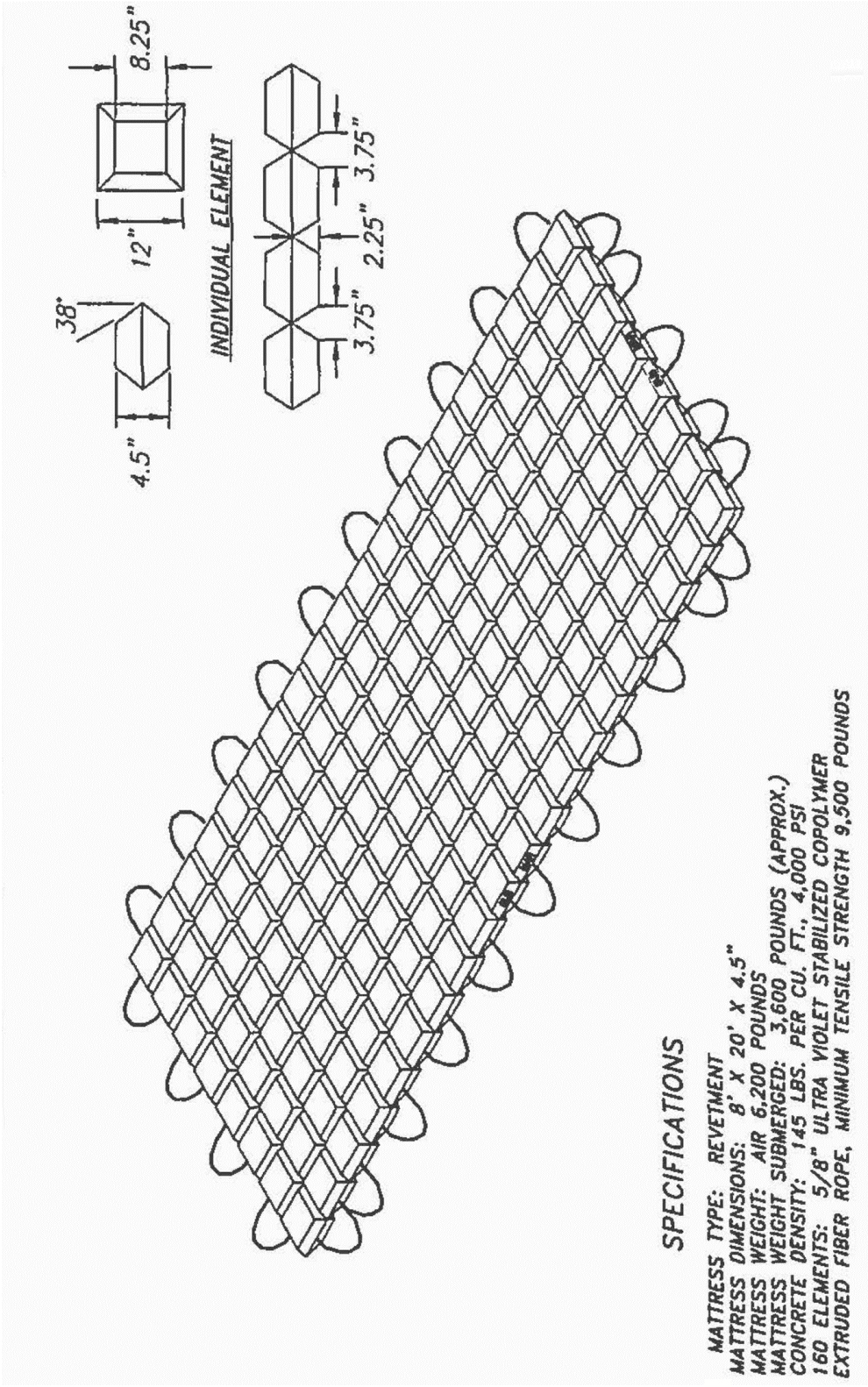
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
COIR LOGS ON DISTURBED SLOPES

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	3E



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

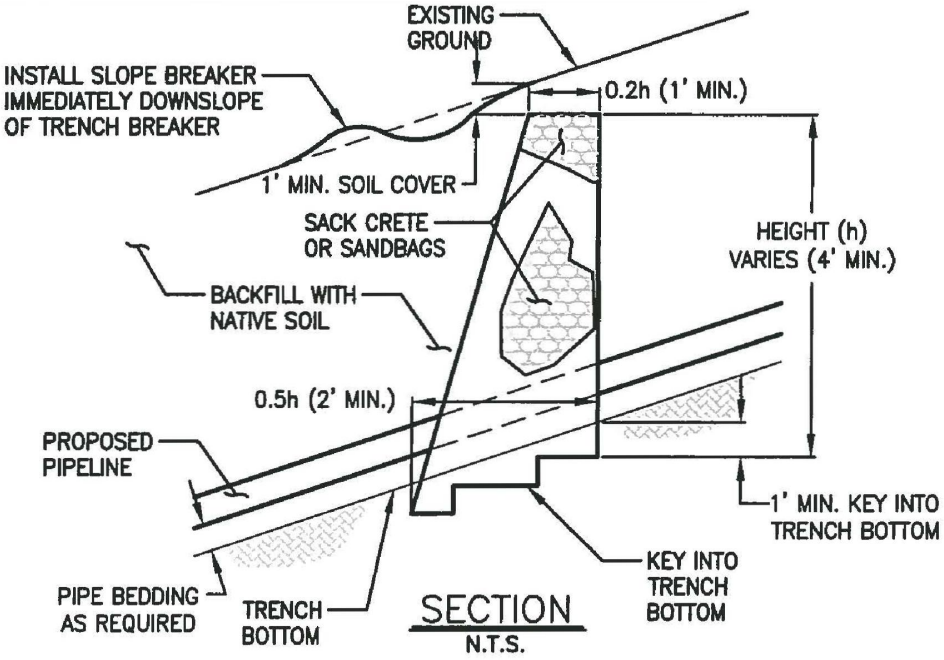
Golder Associates

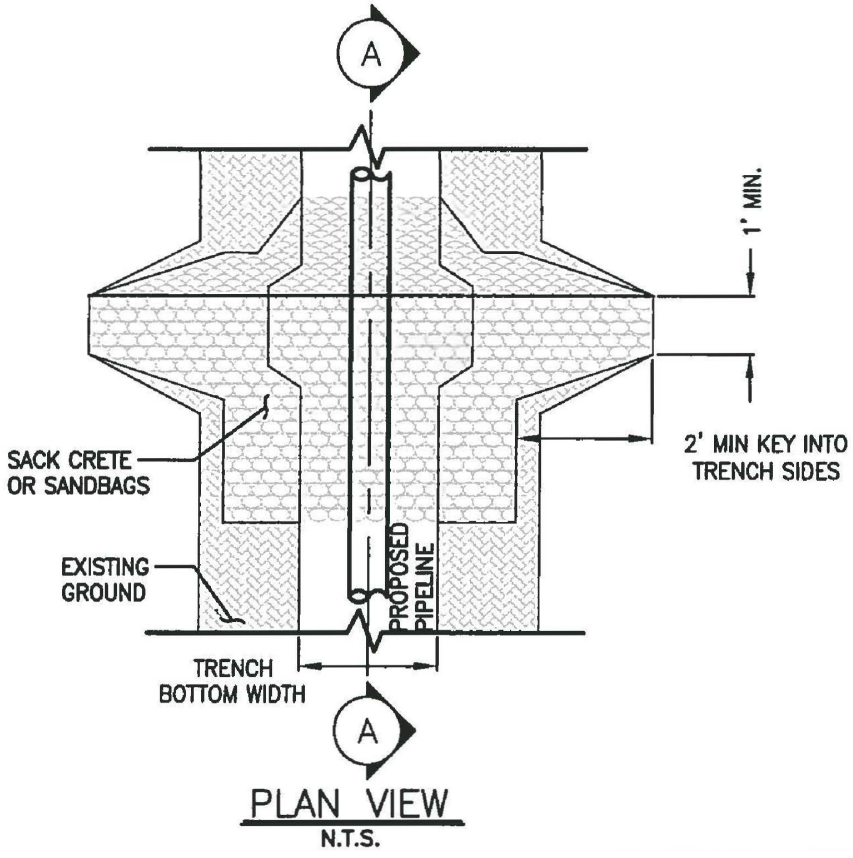
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SUBMAR MATTS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	3F

0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A





CLIENT
DOMINION

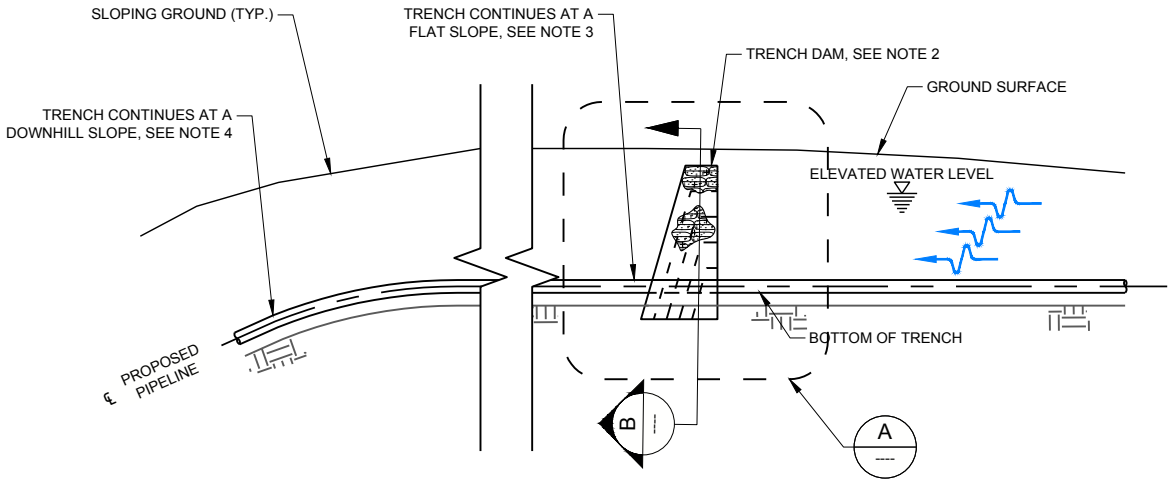
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

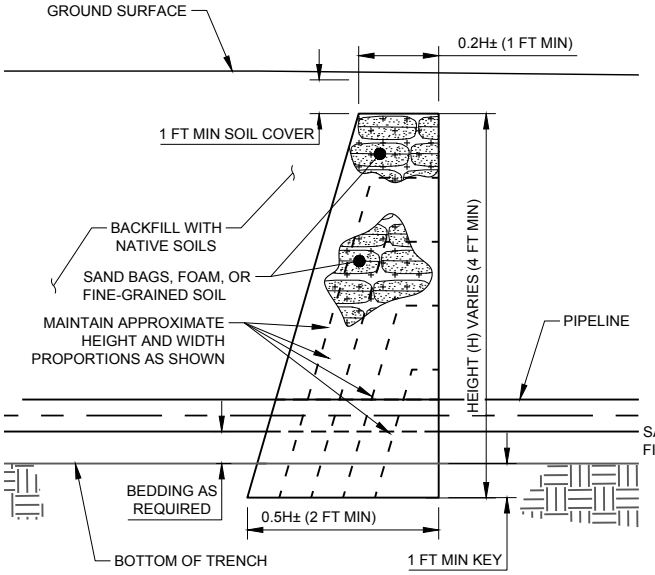
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TRENCH BREAKERS (FOAM AND SANDBAGS)

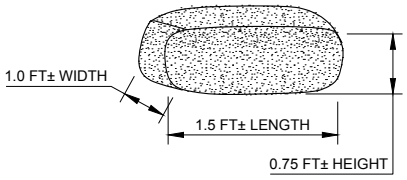
PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4A



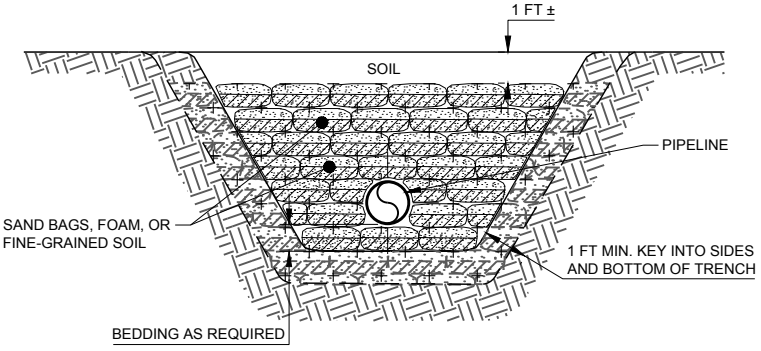
TRENCH DAM CONFIGURATION
N.T.S.



N.T.S A TRENCH DAM DETAIL



SAND BAG DETAIL
N.T.S.



N.T.S B SECTION

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. THE PURPOSE AND INTENT OF TRENCH DAMS IS TO STOP THE FLOW OF WATER IN THE TRENCH WHERE ELEVATED WATER SURFACES MAY EXIST (SUCH AS STREAM CROSSINGS OR PONDED AREAS).
3. INSTALL TRENCH DAM IN LOW / FLAT TERRAIN AREAS THAT MAY HAVE ELEVATED WATER LEVELS. THE PURPOSE OF THE TRENCH DAM IS TO STOP FLOW OF WATER FROM RUNNING DOWN THE FLAT TRENCH.
4. INSTALL TRENCH DAM AT THE TOP OF SLOPES AT AREAS THAT MAY HAVE ELEVATED WATER LEVELS. THE PURPOSE OF THE TRENCH DAM IS TO STOP FLOW OF WATER FROM RUNNING DOWN THE TRENCH ON THE HILL SLOPE.
5. AT LOCATIONS WHERE DAMS ARE SPECIFIED ON DETAILS, PLANS OR AS DIRECTED BY COMPANY REPRESENTATIVE, SOFT PLUGS (UNEXCAVATED SECTIONS ALONG TRENCH-LINE) MAY BE LEFT IN PLACE TO PERFORM FUNCTION OF PERMANENT DAMS PRIOR TO PIPE PLACEMENT.
6. THE TRENCH SHALL BE DEWATERED THROUGH A SEDIMENT TRAP, FILTER BAG, OR DEWATERING STRUCTURE.
7. PERMANENT TRENCH DAMS SHALL BE INSTALLED BEFORE THE TRENCH IS BACKFILLED.
8. TRENCH PLUGS SHALL BE INSTALLED AT THE BANKS OF ALL PERENNIAL STREAM CROSSINGS IMMEDIATELY AFTER TRENCH EXCAVATION. THE PLUGS MAY BE TEMPORARILY REMOVED DURING PIPE PLACEMENT, BUT THEN REPLACED.
9. THE TRENCH SHALL BE DEWATERED THROUGH A SEDIMENT TRAP, FILTER BAG, OR DEWATERING STRUCTURE REFER TO TRENCH DEWATERING DETAIL (TWD).
10. PERMANENT TRENCH DAMS SHALL BE INSTALLED BEFORE THE TRENCH IS BACKFILLED.

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BIC/INCREMENTAL CONTROLS

CONSULTANT
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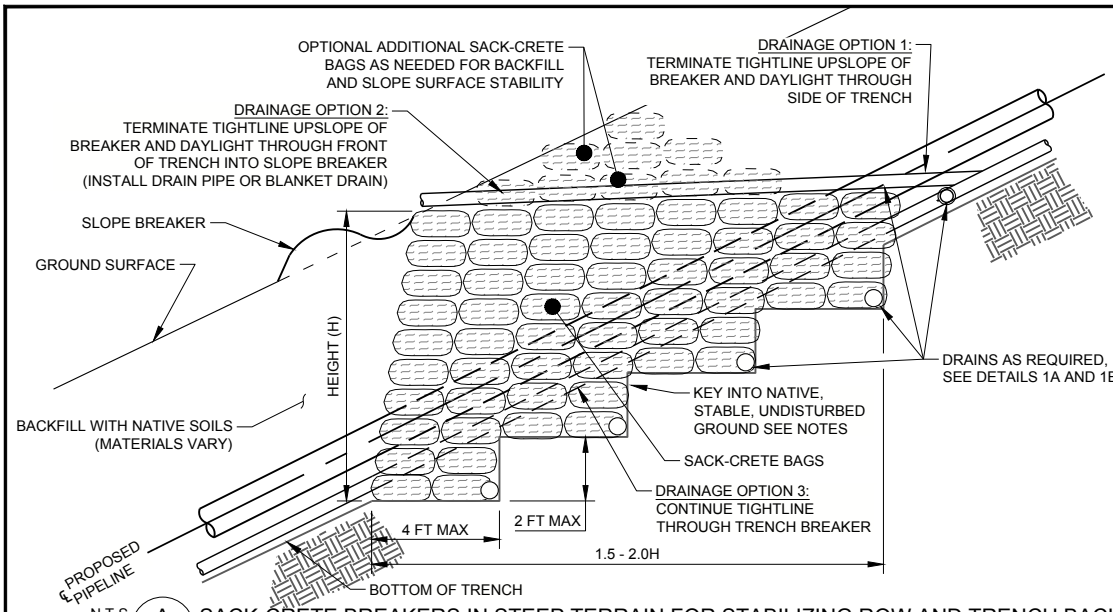
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

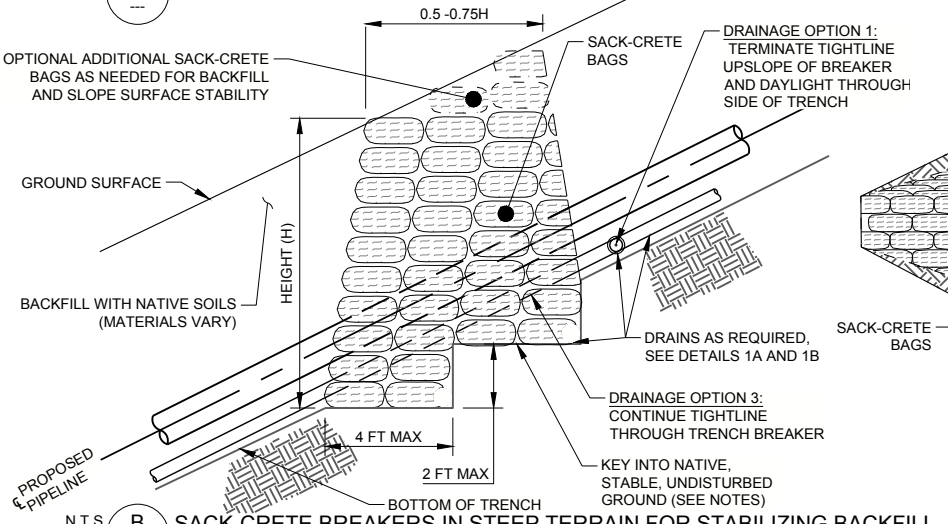
TITLE
TRENCH DAMS (FOAM, BAGS, OR FINE GRAINED SOILS)

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4B

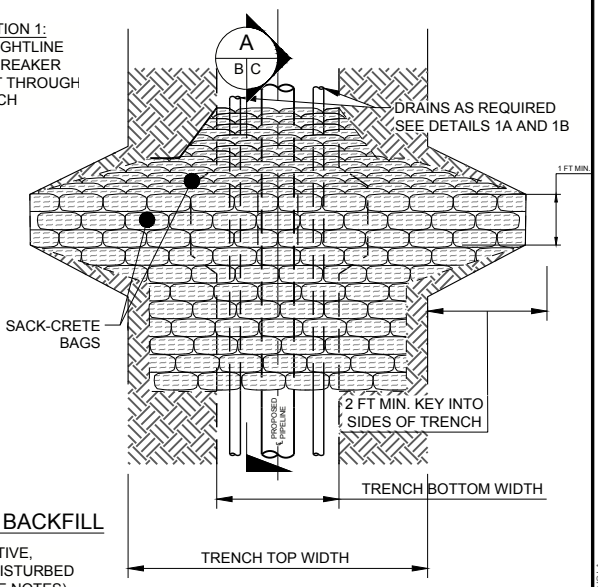
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
0 1 in 1 cm



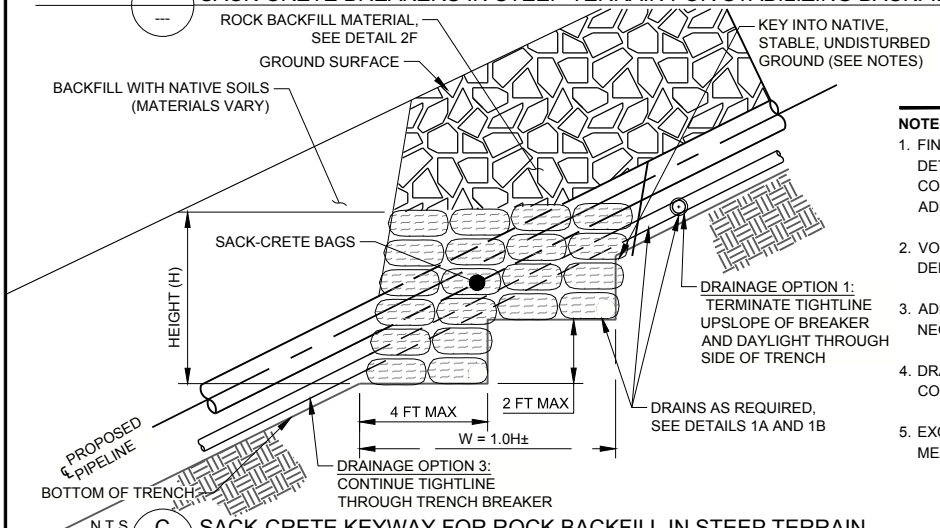
N.T.S A SACK-CRETE BREAKERS IN STEEP TERRAIN FOR STABILIZING ROW AND TRENCH BACKFILL



N.T.S B SACK-CRETE BREAKERS IN STEEP TERRAIN FOR STABILIZING BACKFILL



PLAN VIEW
N.T.S.



N.T.S C SACK-CRETE KEYWAY FOR ROCK BACKFILL IN STEEP TERRAIN

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.
3. ADD OR EXTEND KEYS OR PLACE ADDITIONAL SACK-CRETE BAGS AS NECESSARY TO MAINTAIN STABILITY.
4. DRAINAGE OPTION TO BE SELECTED AT THE TIME OF CONSTRUCTION BASED ON CONDITIONS ENCOUNTERED.
5. EXCAVATE KEY WITH OUTBOARD SLOPE, AND INCLUDE DRAINAGE MEASURES THAT EVACUATE ACCUMULATED SEEPAGE.

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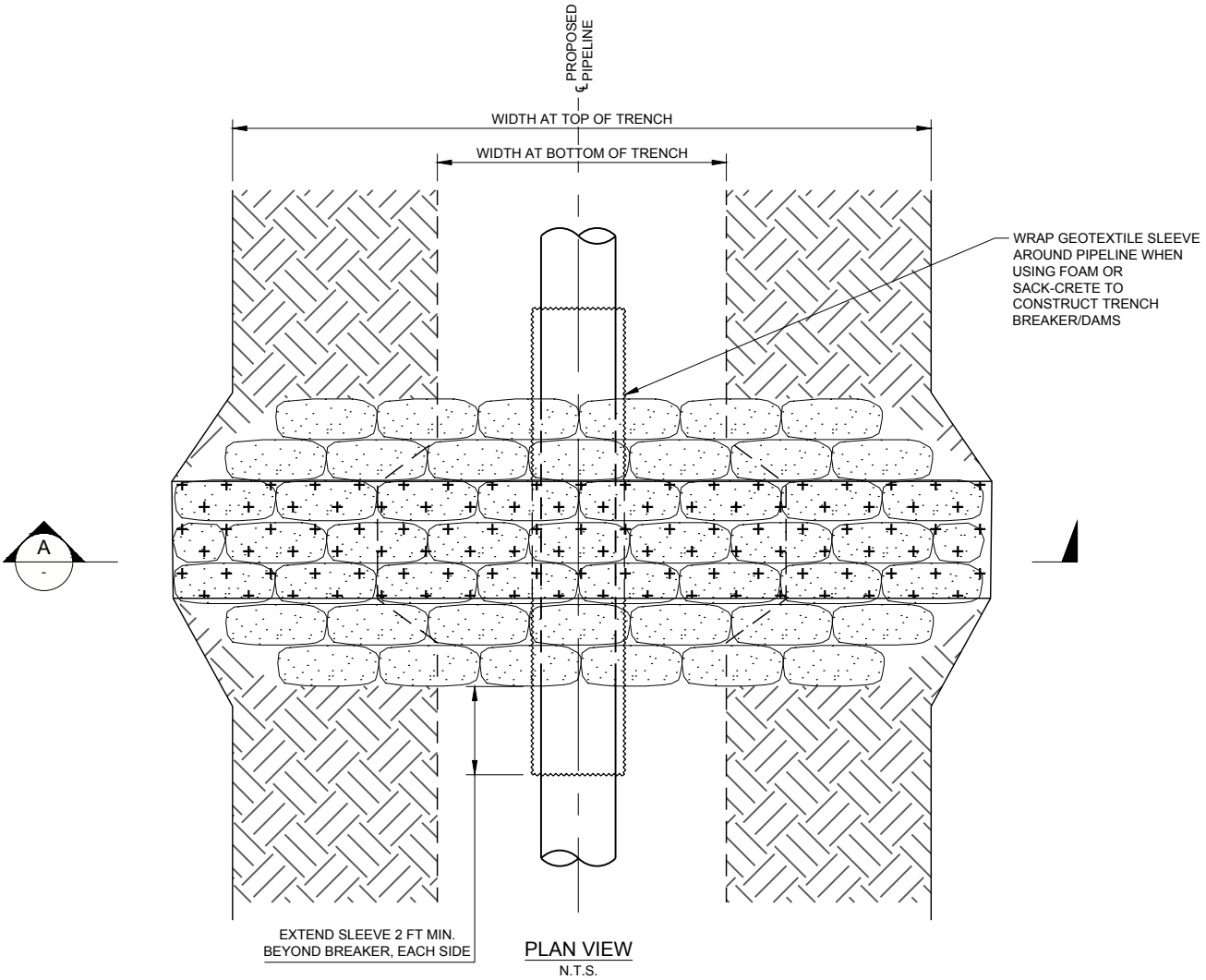
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

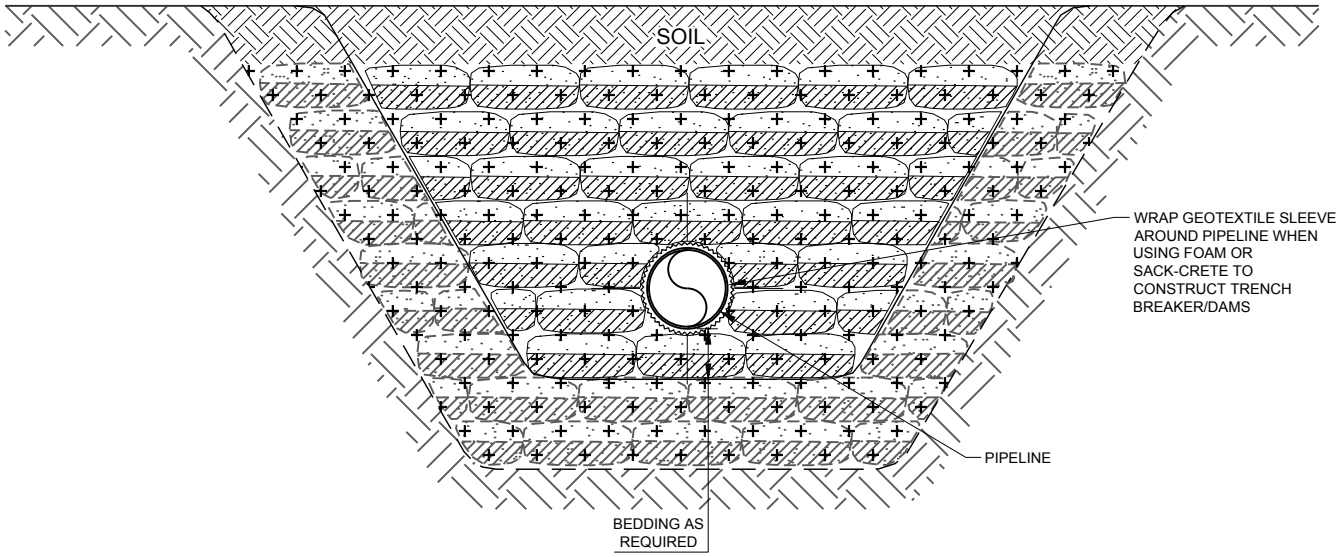
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SACK-CRETE BREAKERS (STRUCTURAL BREAKER)

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4C



PLAN VIEW
N.T.S.



N.T.S A --- ELEVATION

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PROJECT
BIC/INCREMENTAL CONTROLS

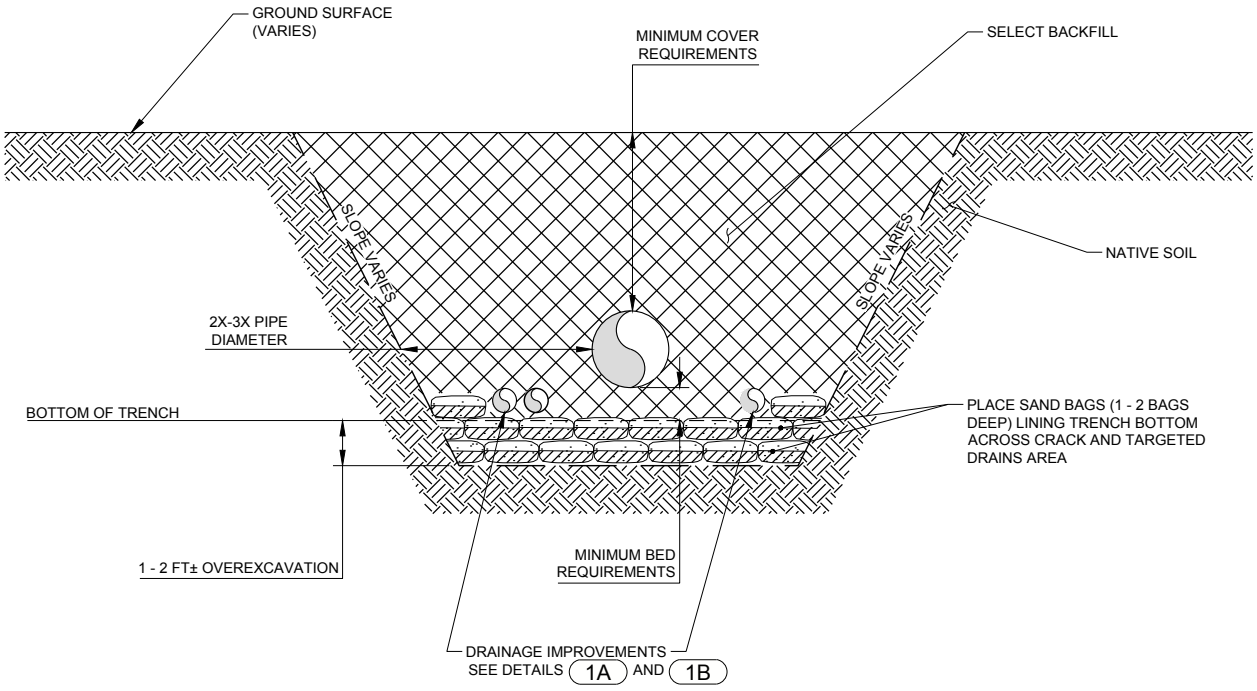
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SLEEVE INTERFACE BETWEEN PIPELINE AND BREAKER

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4D



TYPICAL TRENCH SECTION WITH SEALED BOTTOM

SCALE: N.T.S.

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. MAINTAIN POSITIVE DRAINAGE IN TRENCH ACROSS AREAS SEALED WITH SANDBAGS, DRAINS SHOULD BE PLACED OVER THE SEAL. WATER SHOULD NOT POND BEHIND SEAL.

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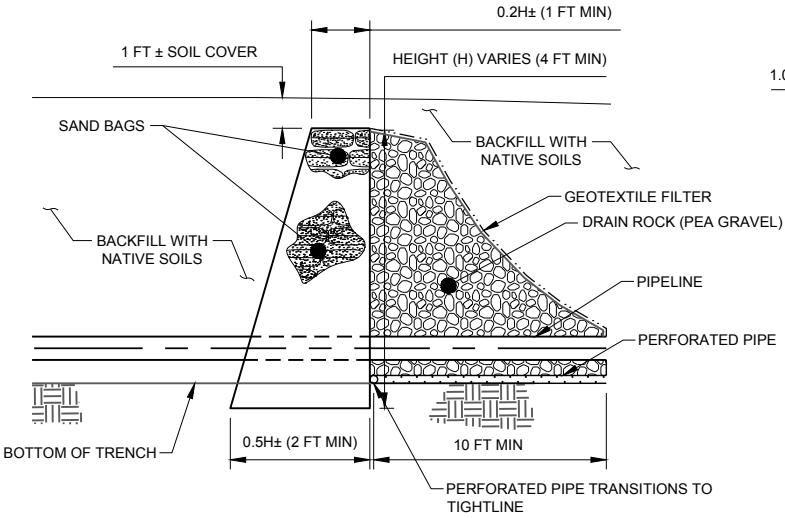
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

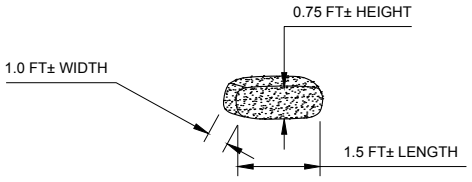
TITLE
SEAL BOTTOM OF TRENCH WITH SANDBAGS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4E



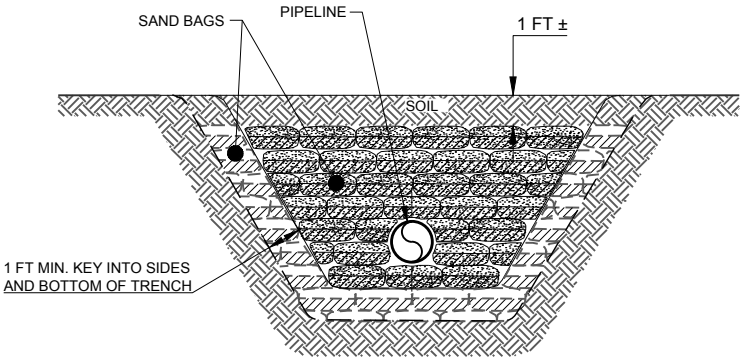
TRENCH BREAKER PROFILE VIEW

SCALE: N.T.S.



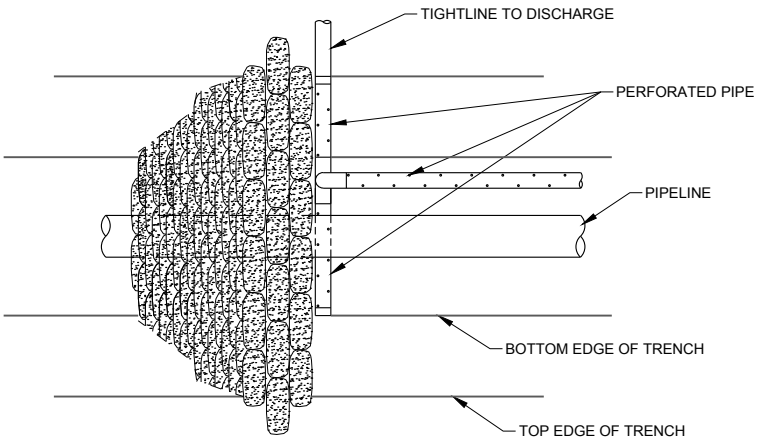
SAND BAG DETAIL

SCALE: N.T.S.



TRENCH BREAKER SECTION VIEW

SCALE: N.T.S.



TRENCH BREAKER PLAN VIEW

SCALE: N.T.S.

NOTE(S)

1. FINAL CONFIGURATION OF REPAIR TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.

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PROJECT
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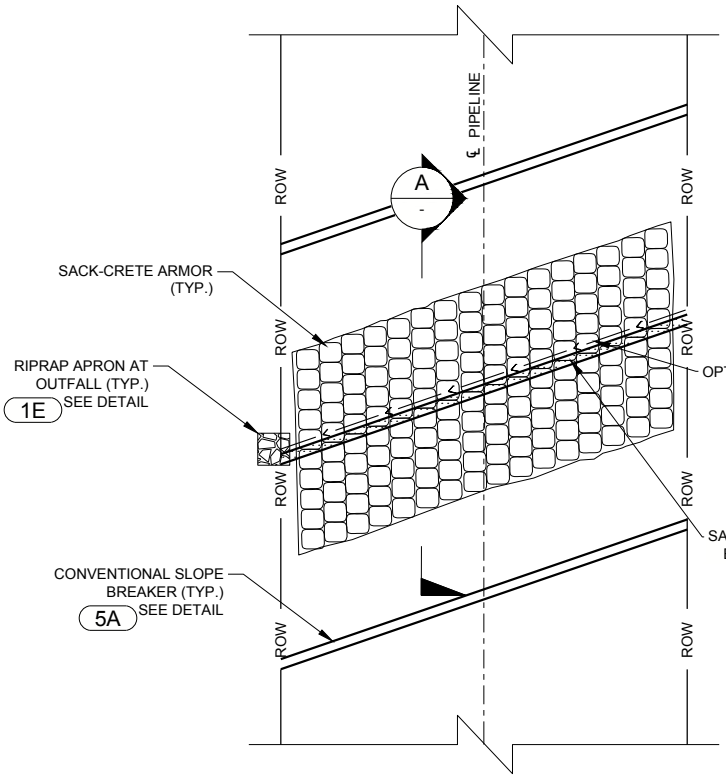
Golder Associates

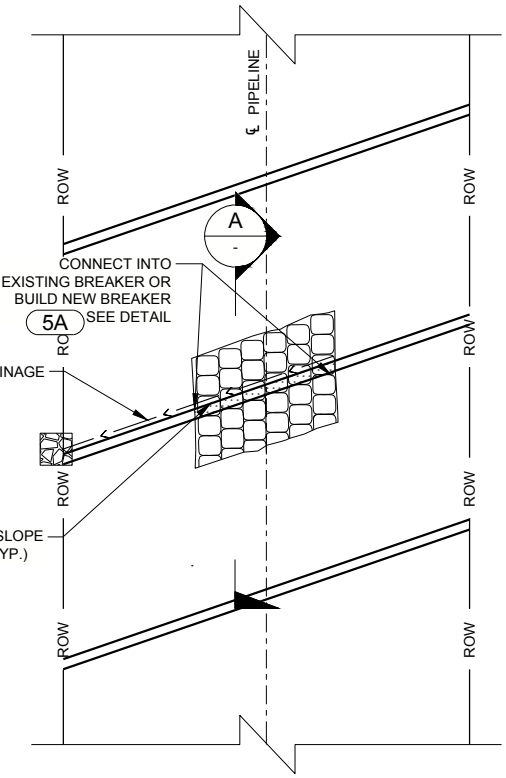
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TRENCH BREAKER WITH DRAINAGE

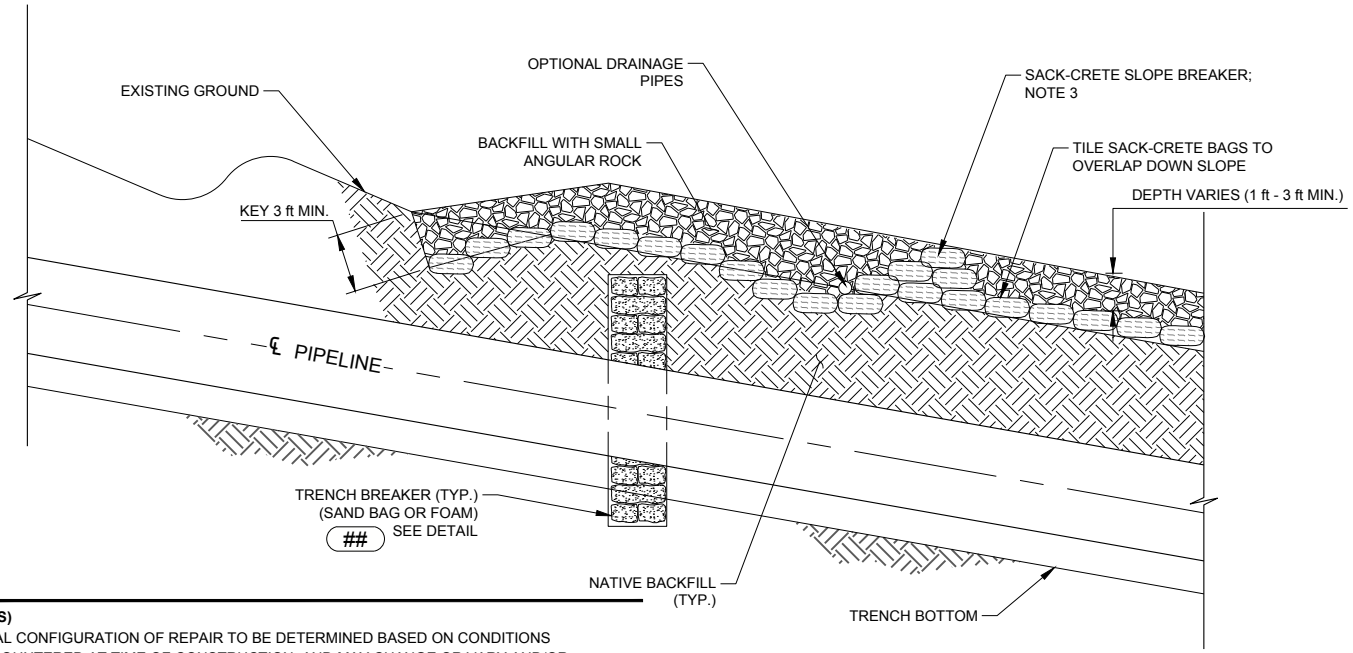
PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4F



OPTION A - EXTEND FULL WIDTH OF ROW



OPTION B - TARGETED REPAIR AREA



A -- SECTION

NOTE(S)

1. FINAL CONFIGURATION OF REPAIR TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.
3. CONSTRUCT SLOPE BREAKER USING SACK-CRETE BAGS (1-4 HIGH) AND SLOPE ALONG ROW TO CONNECT TO EXISTING BREAKERS OR BUILD NEW BREAKERS TO INTERCEPT AND/OR DIVERT SURFACE RUNOFF TO TARGETED LOCATIONS.

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PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SACK-CRETE ARMOR WITH BREAKERS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4G

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. FLOWABLE FILL IS A SELF-COMPACTING LOW STRENGTH MATERIAL WITH FLOWABLE CONSISTENCY THAT IS USED AS AN FILL OR BACKFILL MATERIAL AS AN ALTERNATIVE TO COMPACTED GRANULAR FILL (ACI 229R, AMERICAN CONCRETE INSTITUTE). FLOWABLE FILL IS NOT INTENDED AS A CONCRETE MATERIAL, HENCE THE LOW STRENGTH PARAMETERS.

3. REFER TO MANUFACTURER SPECIFICATIONS FOR DESIGN AND PLACEMENT, EXAMPLE TECHNICAL REFERENCES INCLUDE, BUT ARE NOT LIMITED TO: "RECOMMENDED GUIDE SPECIFICATION FOR CLSM (FLOWABLE FILL)", NRMCA 2PFFGS, NATIONAL READY MIXED CONCRETE ASSOCIATION; ASTM BOOK OF STANDARDS, VOLUMES 04.09 AND 04.02, AMERICAN SOCIETY FOR TESTING AND MATERIALS; "CONTROLLED LOW STRENGTH MATERIALS", ACP SP-150, "THE DESIGN AND APPLICATION OF CONTROLLED LOW STRENGTH MATERIALS (FLOWABLE FILL)", ASTM STP 1331, "CONTROLLED LOW-STRENGTH MATERIALS", AMERICAN CONCRETE INSTITUTE.

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PROJECT
BIC/INCREMENTAL CONTROLS

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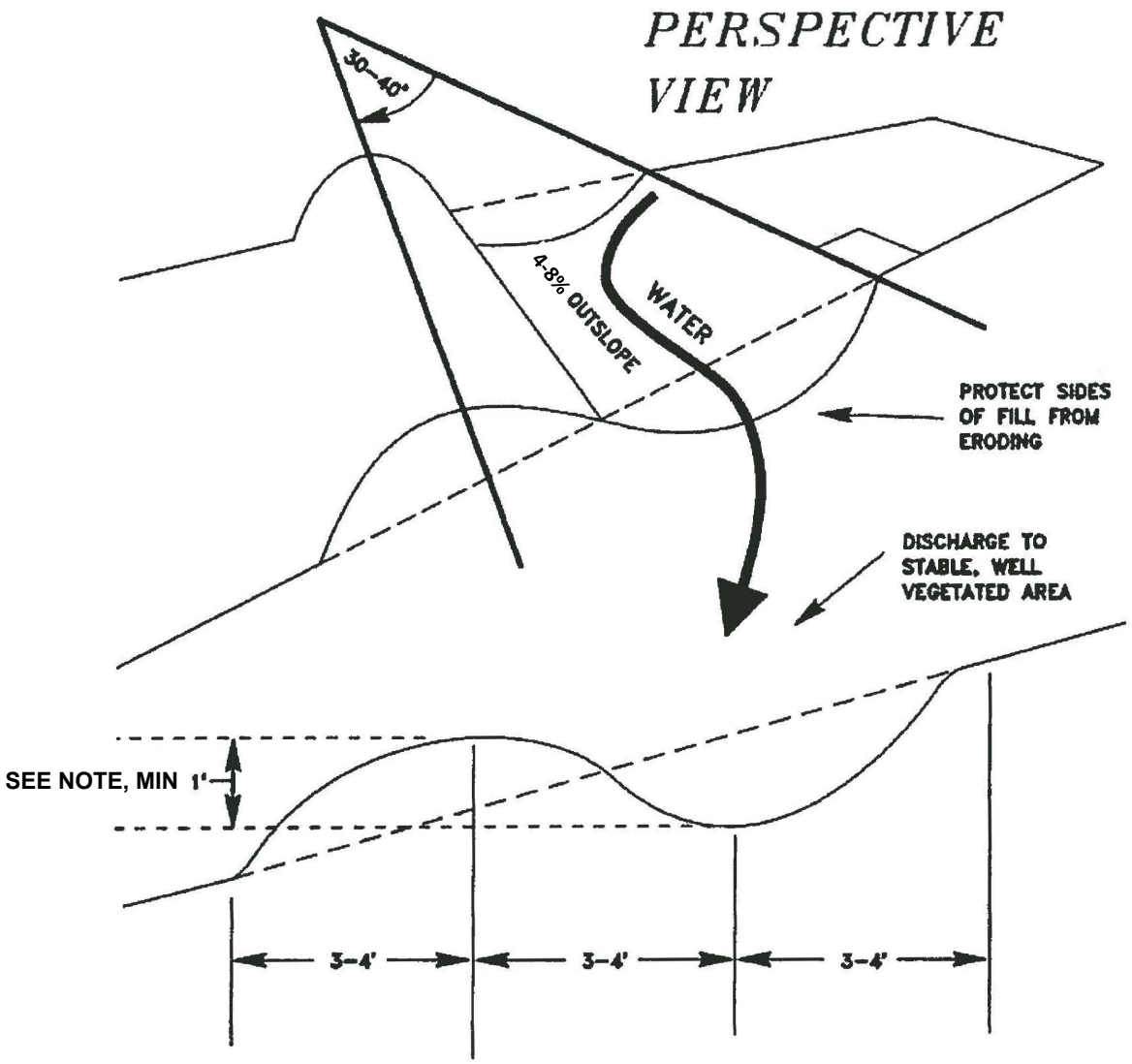
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
FLOWABLE FILL FOR TRENCH BACKFILL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	4H



INCREASE THE DISTANCE BETWEEN THE BOTTOM OF THE DIP AND TOP OF THE BERM FOR IMPROVE DRIVEABILITY

NOTE(S)

1. FINAL CONFIGURATION OF REPAIR TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION.
2. DEPTH BETWEEN BOTTOM OF DIP AND TOP OF BERM MAY INCREASE, AS DIRECTED BY DOMINION.

CLIENT
DOMINION

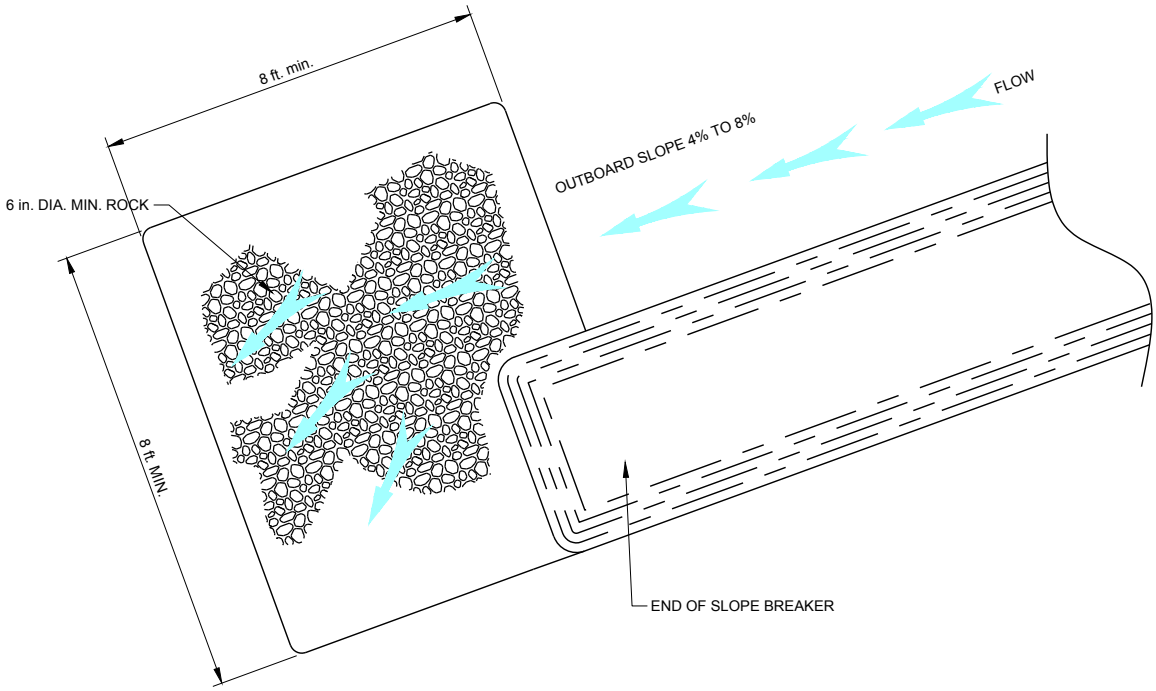
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SLOPE BREAKERS (TEMP AND PERMANENT)

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5A



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

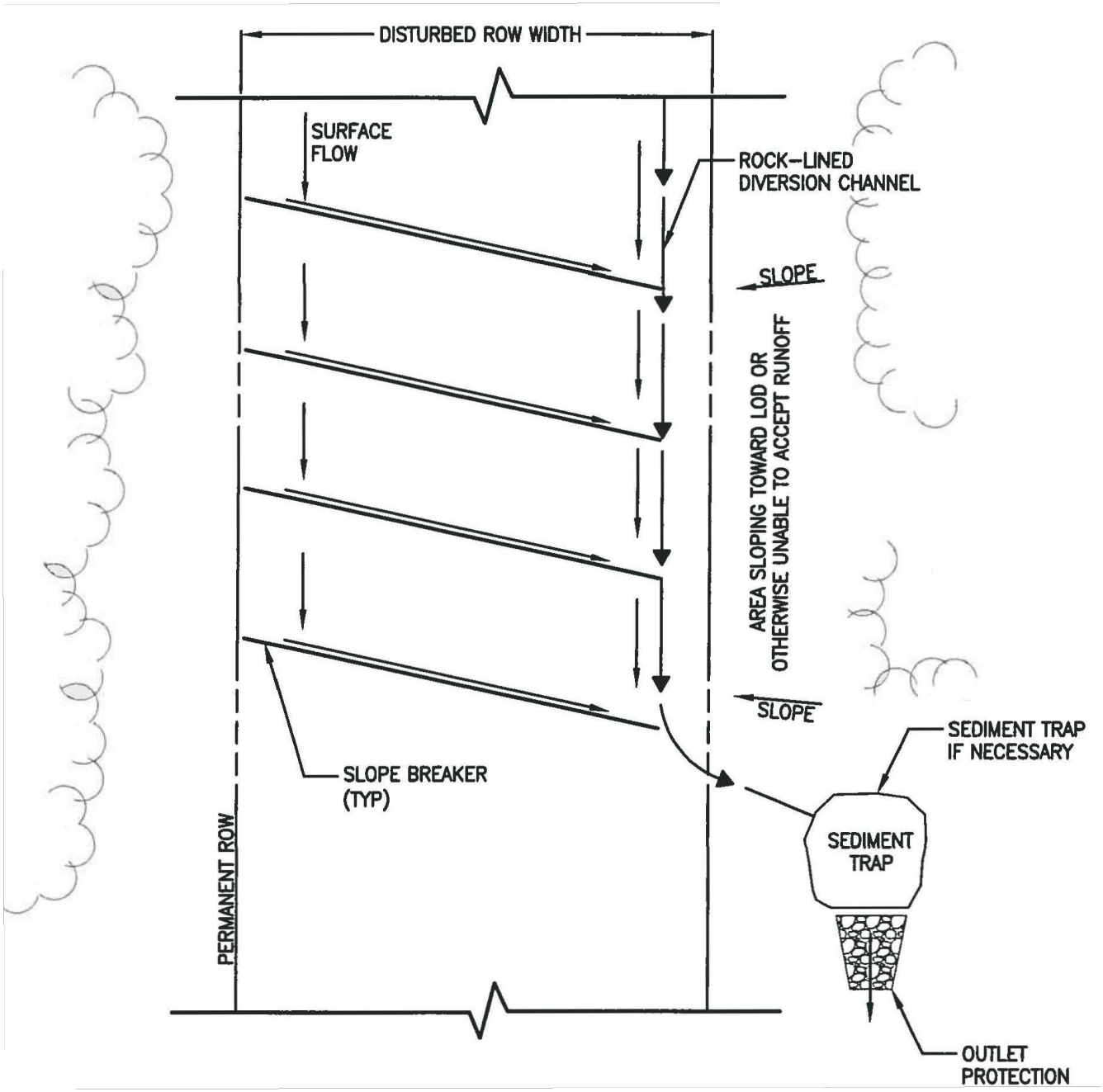
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SLOPE BREAKER ARMORED OUTLET

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5B



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. CHANNEL(S) MAY REQUIRE STONE CHECK DAMS, EROSION CONTROL CLOTH, OR OTHER SITE SPECIFIC MITIGATION MEASURES, TO FIT SITE CONDITIONS.
3. SEDIMENT TRAP AND OUTLET PROTECTION REQUIRES SIZING.
4. DRAINS MAY BE ADDED TO THE UPSLOPE SIDE OF SLOPE BREAKERS (SEE BIC 1A) TO IMPROVE COLLECTION/CONVEYANCE OF FLOWS.
5. DIVERSION CHANNEL MAY BE ROCK LINED, EROSION CONTROL CLOTH LINED, OR VEGETATED TO FIT SITE CONDITIONS, AND MAY INCLUDE DRAINAGE PIPES TO IMPROVE COLLECTION/CONVEYANCE OF FLOWS (SEE BIC 1F OR 1H).

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PROJECT
BIC/INCREMENTAL CONTROLS

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SLOPE BREAKERS WITH DIVERSION CHANNELS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5C

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. SPECIAL CARE AND CONSIDERATION IS REQUIRED TO CONSTRUCT DRAINAGE MEASURES FOR EXISTING, PERMANENT, AND TEMPORARY ACCESS ROADS ON A SITE-SPECIFIC BASIS. ACCESS ROADS MAY COLLECT RUNOFF FROM UPSLOPE AREAS AND DELIVER WATER TO THE ROW, PIPE TRENCH, OR TO OTHER GEOTECHNICAL, GEOLOGIC, OR HYDROTECHNICAL AREAS OF CONCERN. RECOMMENDED DRAINAGE MEASURES FOR ACCESS ROADS INCLUDE THE FOLLOWING:

A. DRAINAGE MEASURE MAY REQUIRE SITE SPECIFIC DESIGN WITH REGARD FOR SLOPE, DRAINAGE AREA, EROSION PROTECTION , DISCHARGE ARMORED PAD, CHECK DAMS, ETC.
B. INSTALL WATER BARS (I.E. SLOPE BREAKERS) EVERY 100-200 FEET ALONG THE ACCESS ROAD, PROVIDED THAT WATER IS NOT DISCHARGED ONTO OR ABOVE GEOTECHNICALLY SENSITIVE AREAS (LANDSLIDES, AREAS OF FILL, POTENTIALLY UNSTABLE SLOPES, ETC.) OR THE ROW.
C. INSTALL INBOARD SLOPES WITH BAR DITCH (LINED OR ARMORED AS NECESSARY) UPSLOPE OF GEOTECHNICALLY SENSITIVE AREAS AND/OR THE ROW TO CONVEY WATER TO A STABLE DISCHARGE POINT.
D. INSTALL FRENCH DRAINS AS NEEDED TO COLLECT WATER IN AREAS WHERE WATER BARS AND BAR DITCHES CAN NOT BE USED OR WOULD RESULT IN DIRECTING WATER INTO THE ROW OR PIPE TRENCH. FRENCH DRAINS SHOULD CONVEY COLLECTED WATER IN A TIGHTLINE (SOLID WALL PIPE) TO A STABLE DISCHARGE POINT.
E. INSTALL EROSION PROTECTION FOR CONCENTRATED FLOWS AND DISCHARGE POINTS/OUTLETS AS NECESSARY (I.E. CHANNEL LINING, RIPRAP APRON, ETC.).
F. DO NOT ALLOW WATER DELIVERED FROM ACCESS ROADS TO CROSS OR ENTER THE PIPE TRENCH.
G. SPECIAL STUDY MAY BE REQUIRED FOR COMPLEX SITES OR AREAS OF CONCERN.

3. CHANGES IN THE FINAL GRADING MAY BE NEEDED TO ADDRESS SPECIFIC TARGETED GEOTECHNICAL OR HYDROTECHNICAL OR GEOLOGIC ENGINEERING ISSUES (I.E. CORRECT DRAINAGE PROBLEMS, MINIMIZE DELIVERY OF WATER TO LANDSLIDE SITES, ETC.)

4. FINAL GRADING TO BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO COMPLETION.

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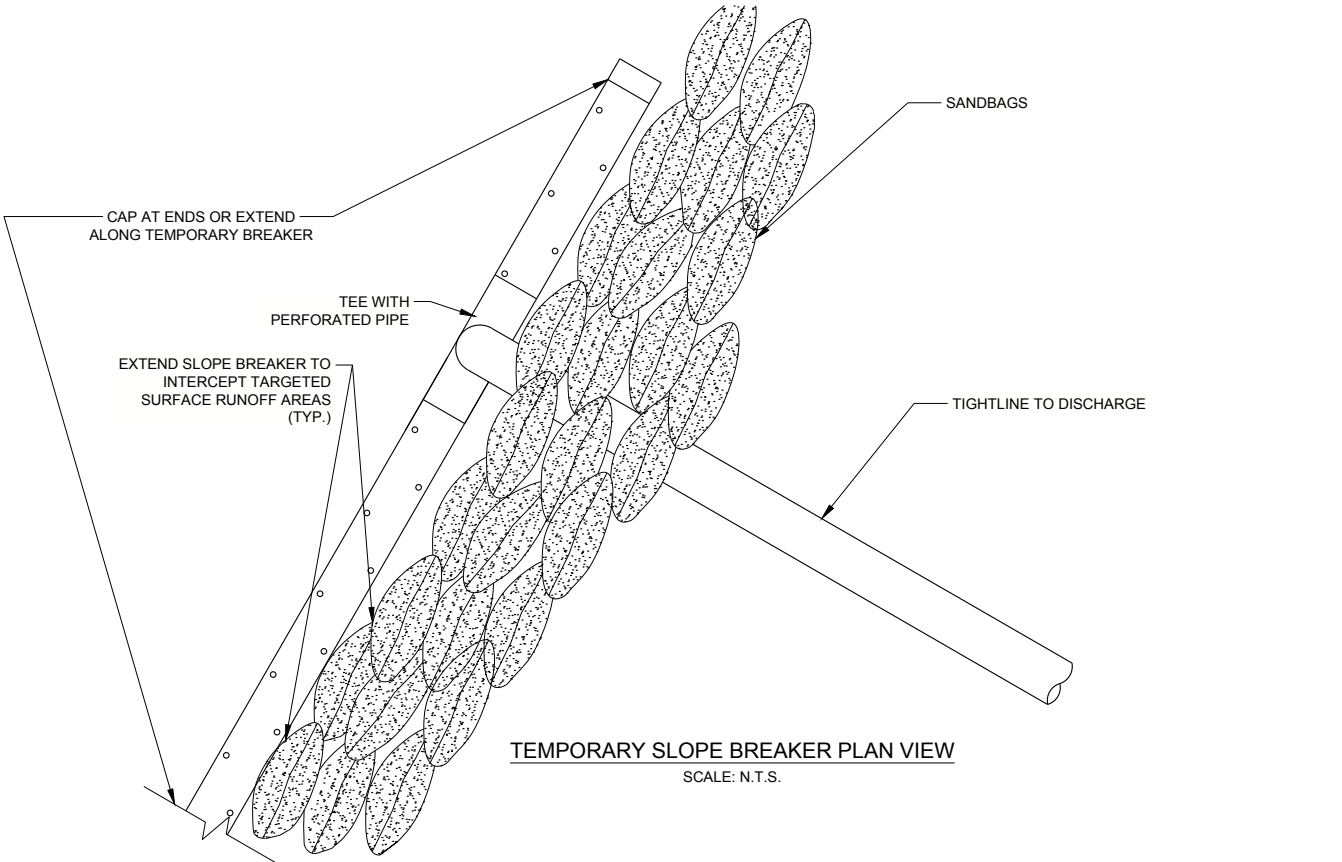
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

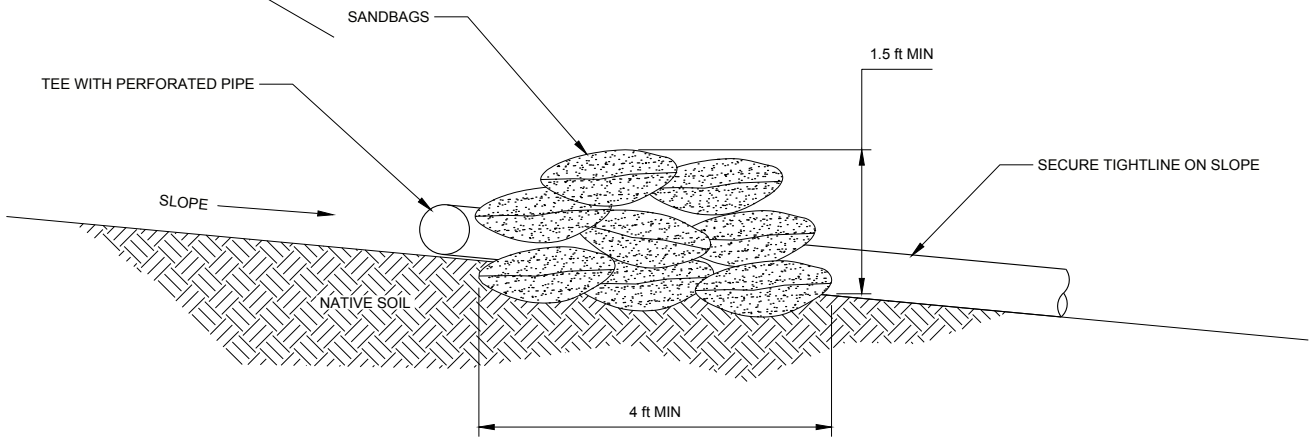
TITLE
ACCESS ROADS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5D



TEMPORARY SLOPE BREAKER PLAN VIEW

SCALE: N.T.S.



TEMPORARY SLOPE BREAKER PROFILE VIEW

SCALE: N.T.S.

NOTE(S)

1. FINAL CONFIGURATION OF REPAIR TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.
2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

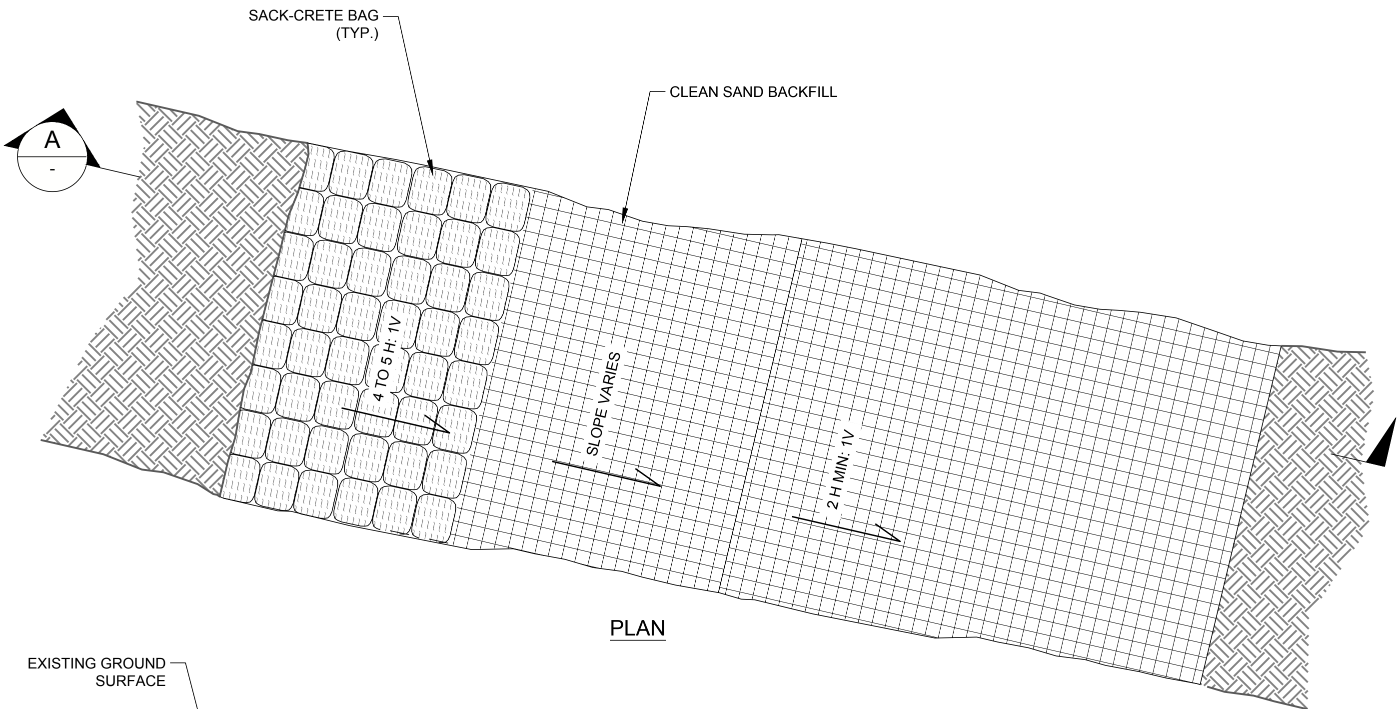
CONSULTANT

Golder Associates

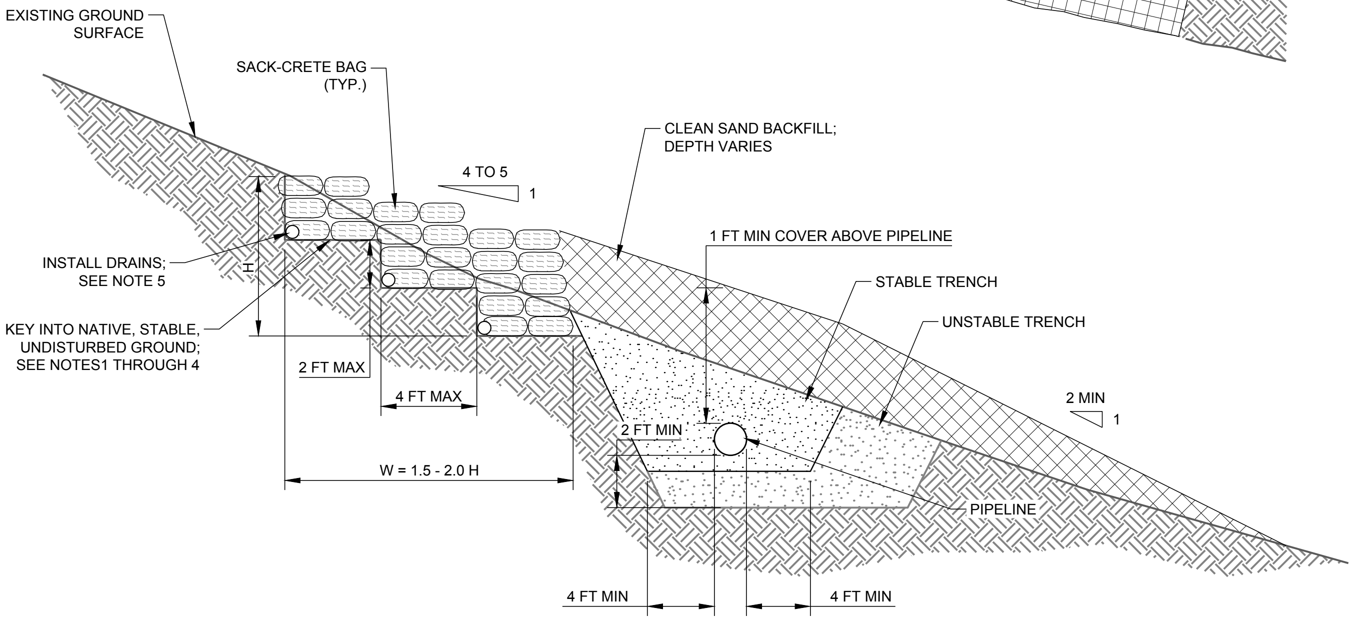
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TEMPORARY SLOPE BREAKER WITH DRAIN PIPE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5E



PLAN



A
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SECTION

NOTE(S)

1. FINAL CONFIGURATION OF REPAIR TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. VOLUMES, GRADES, ELEVATIONS AND QUANTITIES, WILL VARY DEPENDING ON SITE CONDITIONS ENCOUNTERED.

3. ADD OR EXTEND KEYS OR PLACE ADDITIONAL SACK-CRETE BAGS AS NECESSARY TO MAINTAIN STABILITY.

4. EXCAVATE KEY WITH OUTBOARD SLOPE, AND INCLUDE DRAINAGE MEASURES THAT EVACUATE ACCUMULATED SEEPAGE.

5. DRAINAGE OPTION AND CONFIGURATION TO BE SELECTED AT THE TIME OF CONSTRUCTION BASED ON CONDITIONS ENCOUNTERED. CONSTRUCT DISCHARGE OUTFALL AT A LOCATION THAT DOES NOT IMPACT SITE CONDITIONS (LOCATION WITH POSITIVE DRAINAGE FROM THE ROW AND LANDSLIDE / POTENTIALLY UNSTABLE AREAS).

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SACK-CRETE WEDGE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5F

NOTE(S)

1. FINAL CONFIGURATION OF REPAIR TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. NO WOOD CHIPS OR GROUND-UP WOODY/ORGANIC DEBRIS, OR SIMILAR IS ALLOWED TO BE PLACED OR SPREAD ON THE ROW, UNLESS DIRECTED BY DOMINION.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

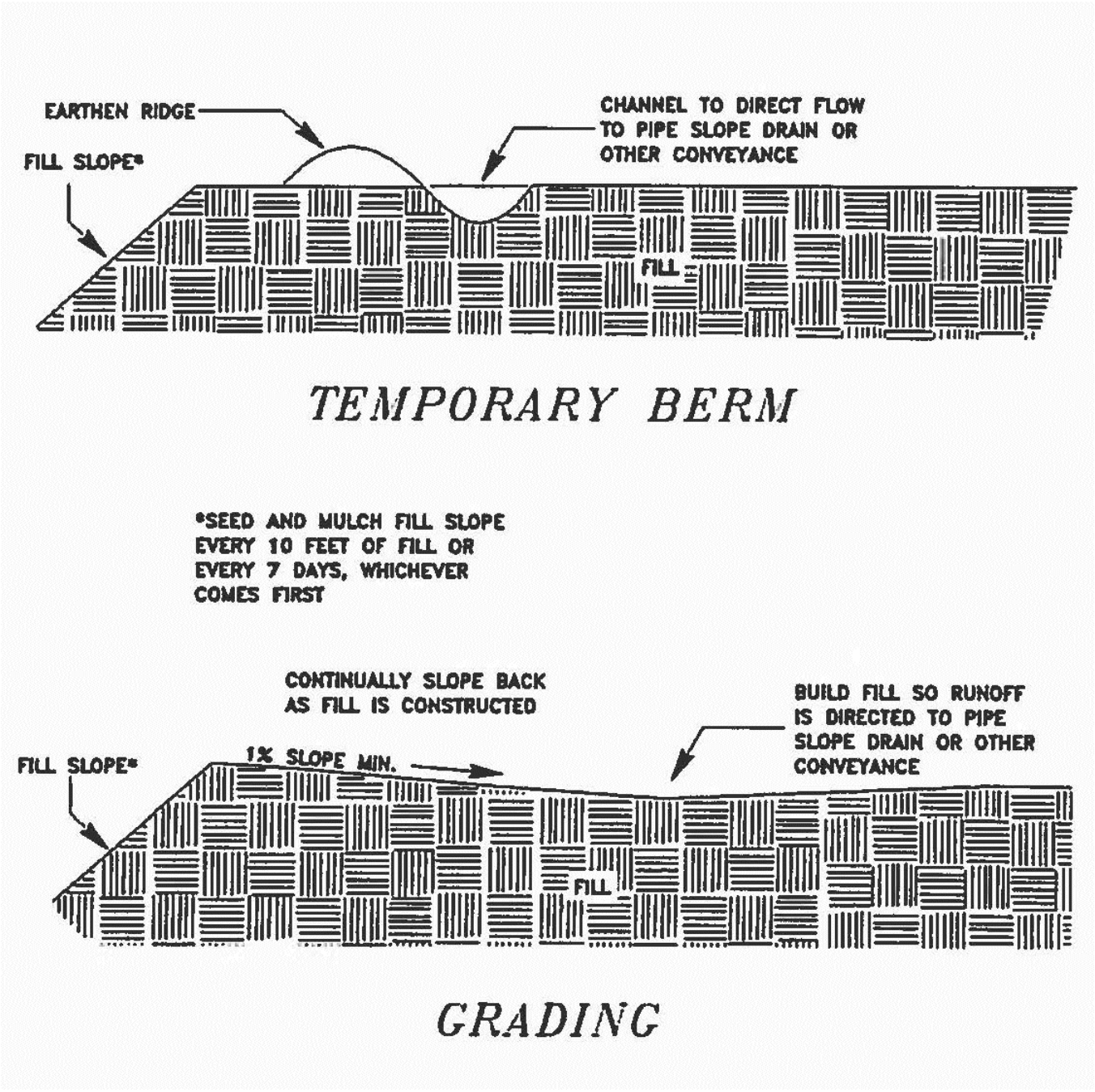
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
NO WOOD CHIPS IN ROW

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5G

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

0 1 in



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

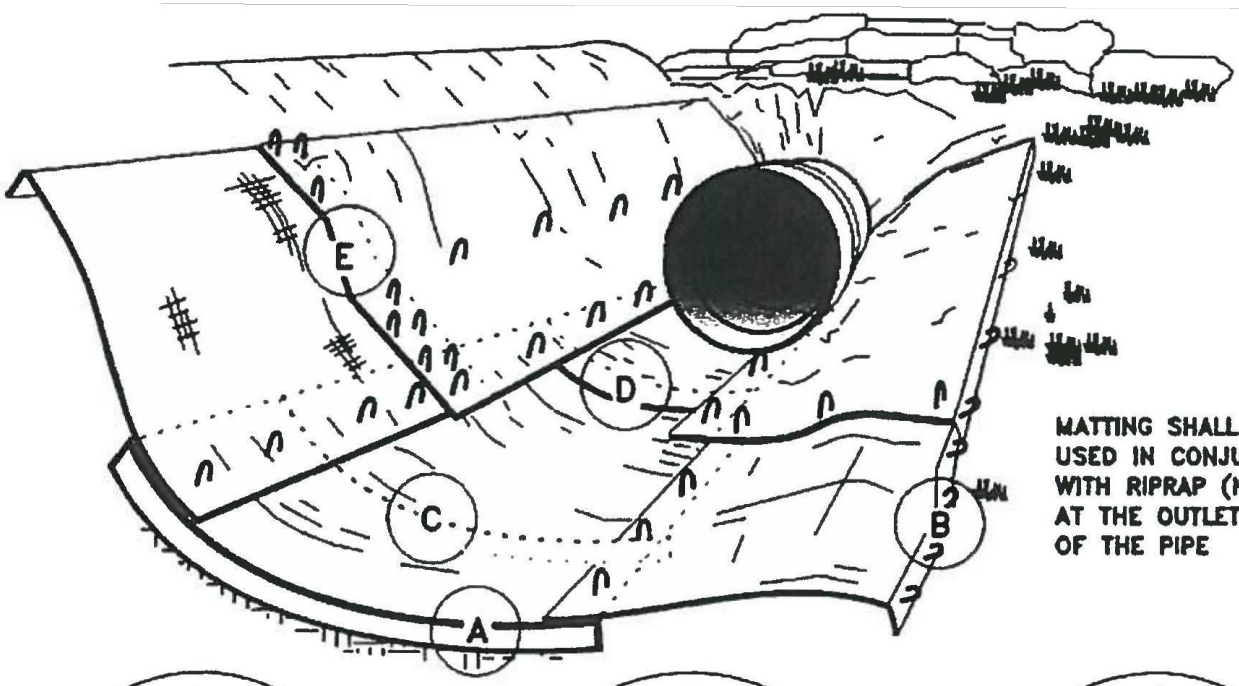
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

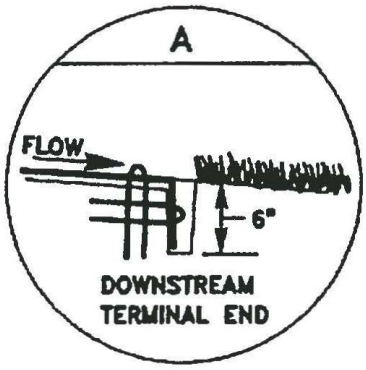
TITLE
SURFACE WATER DIVERSIONS

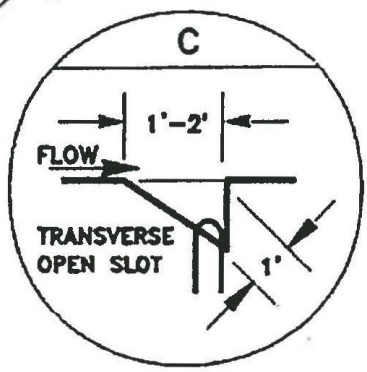
PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	5H

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
0 1in



MATTING SHALL BE USED IN CONJUNCTION WITH RIPRAP (NOT SHOWN) AT THE OUTLET END OF THE PIPE





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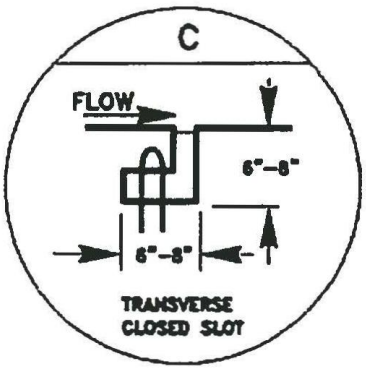
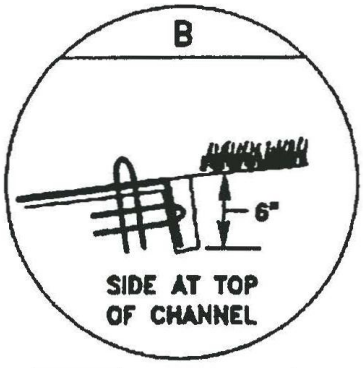
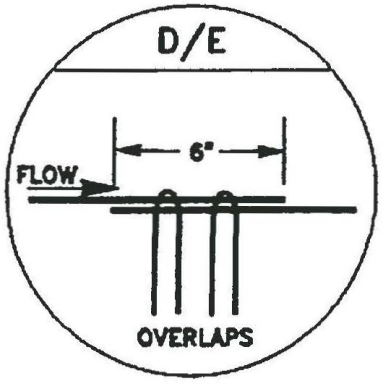


THESE CONFIGURATIONS ARE EXAMPLES ONLY
ALWAYS INSTALL PER MANUFACTURER'S RECOMMENDATIONS





CLIENT
DOMINION

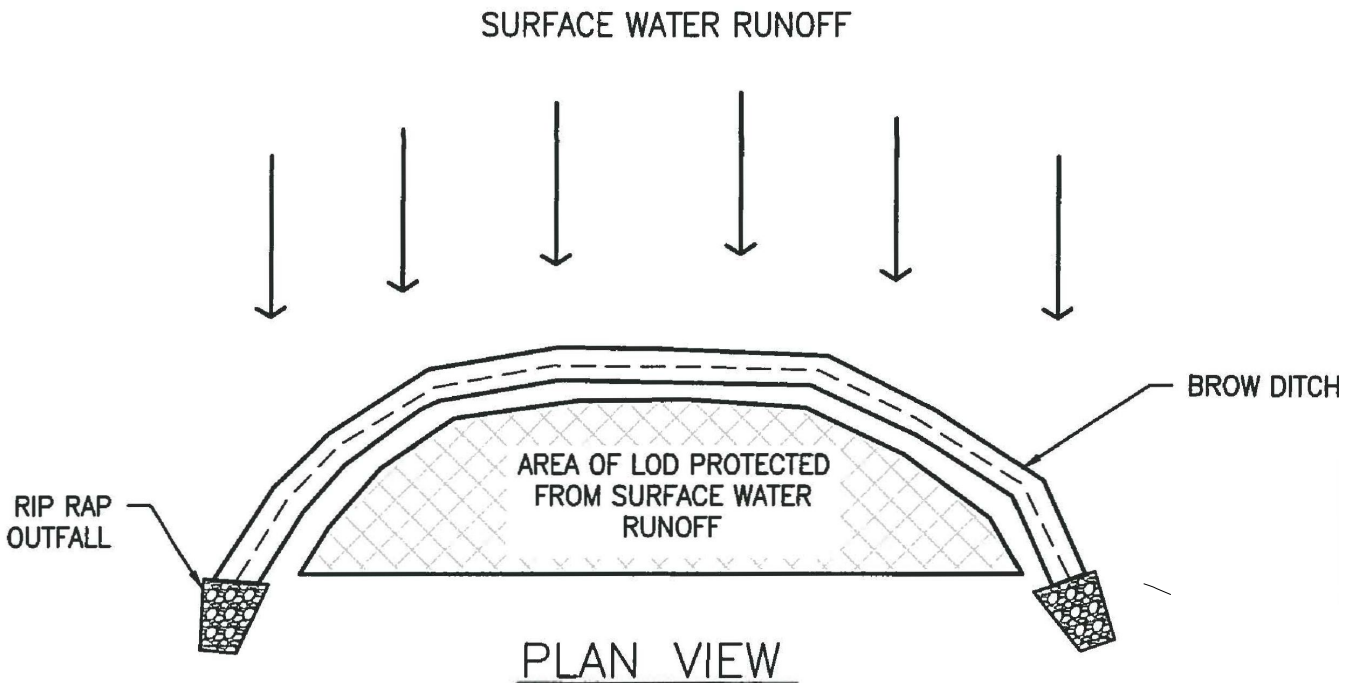
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

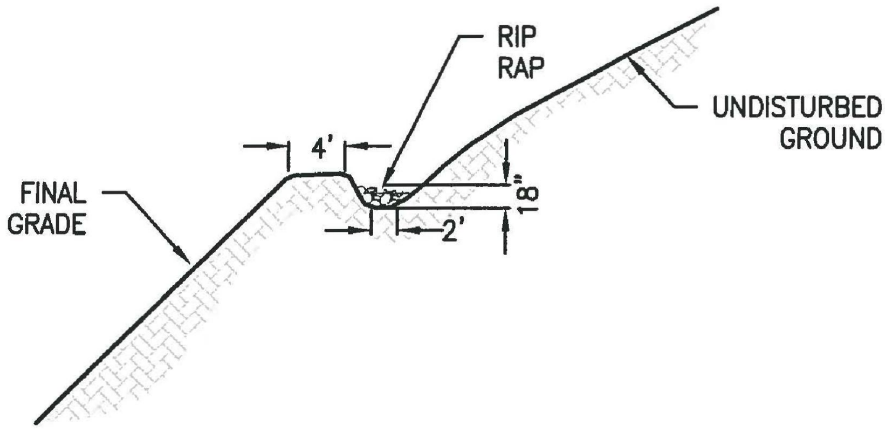
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
COIR-LINED VEGETATED DIVERSION CHANNEL

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6A



PLAN VIEW
N.T.S.



SECTION
N.T.S.

CLIENT
DOMINION

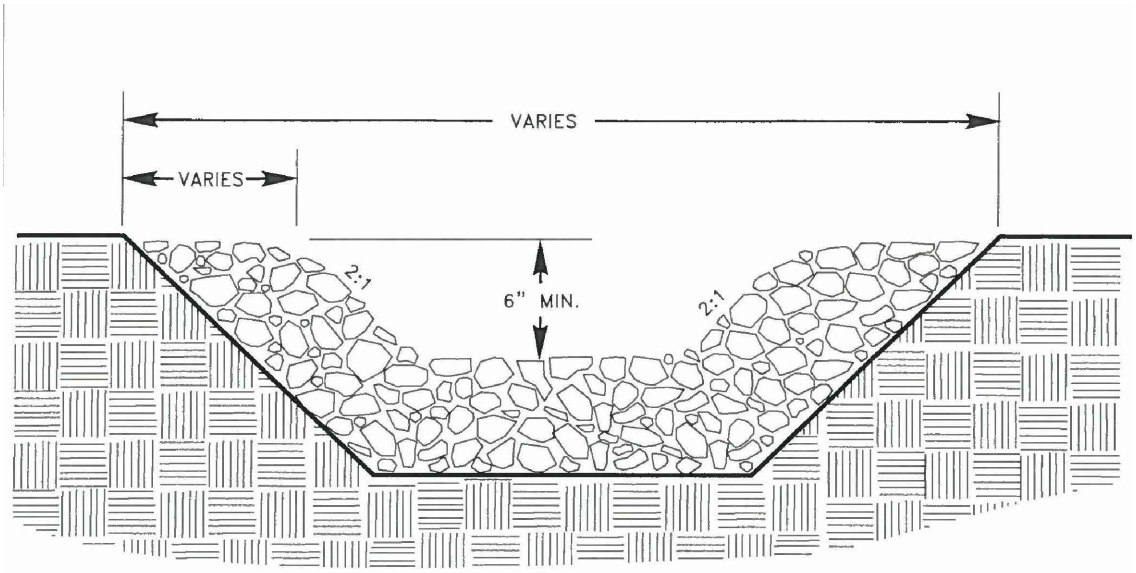
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

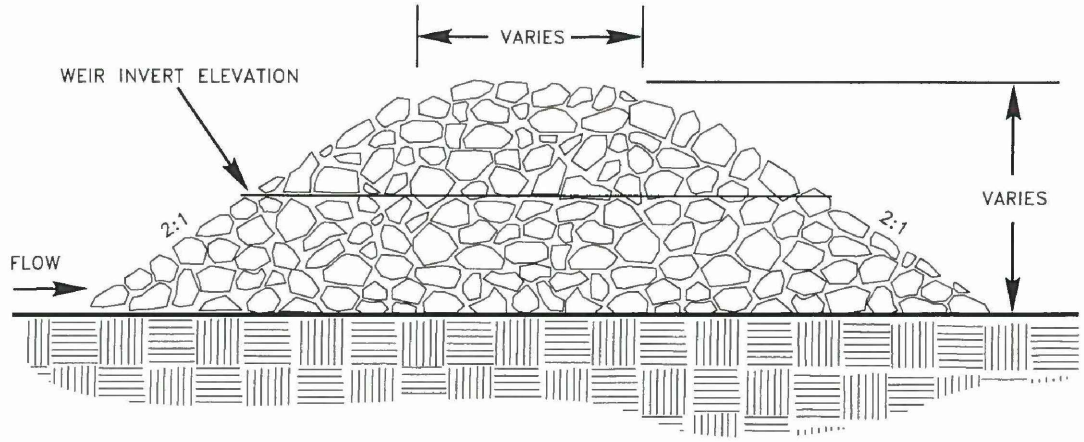
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
BROW DITCH

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6B



ELEVATION



CROSS SECTION

CLIENT
DOMINION

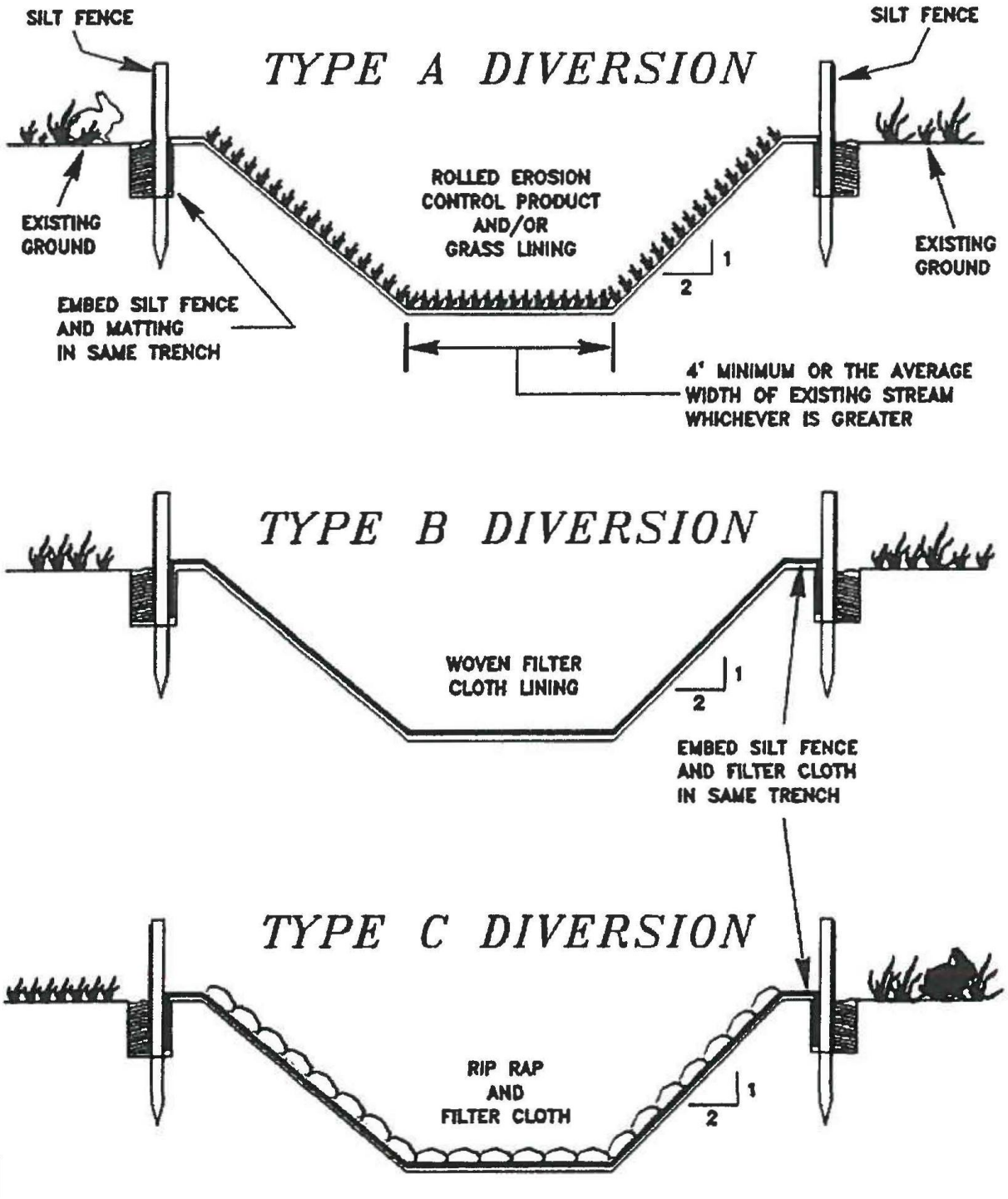
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ROCK FILTER IN TRENCH

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6C



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

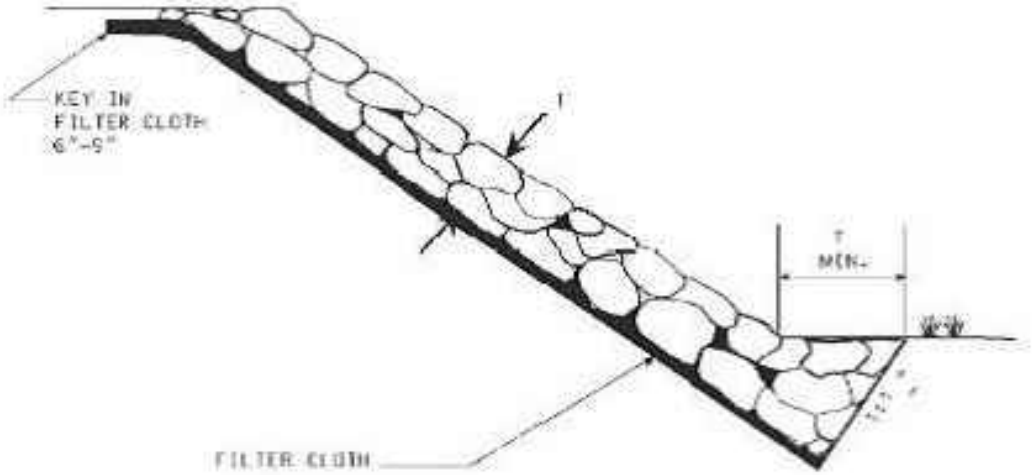
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ARMORED CHANNEL

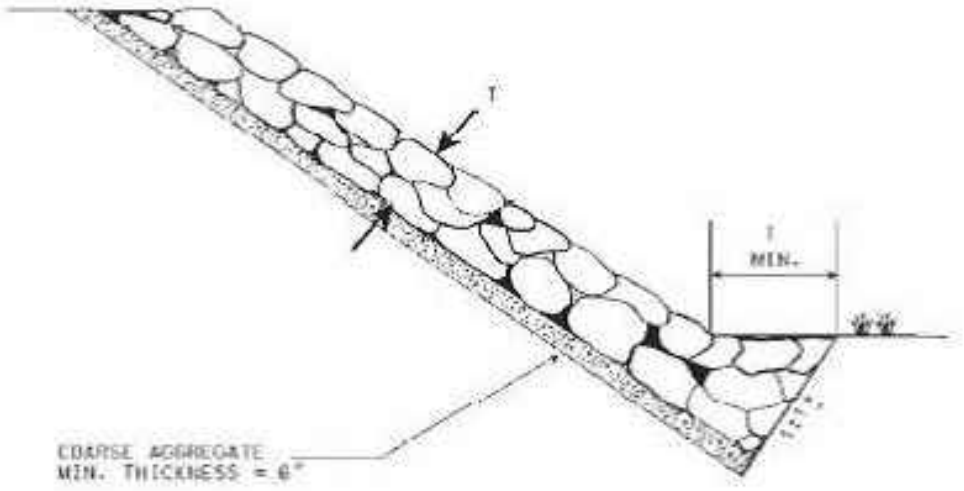
PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6D

FILTER CLOTH UNDERLINER

(PREFERRED)



GRANULAR FILTER



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP BANK ARMORING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6E

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. REFER TO THE FOLLOWING FOR EXAMPLE RIPRAP SPECIFICATIONS:

NSA No.	GRADING ROCK SIZE (INCHES)			FILTER BLANKET REQUIEMENTS		VMAX (ft./SEC.)
	MAX.	d_{50}	MIN.	SIZE NSA NO.	PLACEMENT THICKNESS	
R-1	1.5	0.75	NO.8	FS-1	N/A	2.5
R-2	3	1.5	NO.1	FS-1	N/A	4.5
R-3	6	3	NO.2	FS-1	3	6.5
R-4	12	6	NO.3	FS-2	4	9
R-5	18	9	NO.5	FS-2	6	11.5
R-6	24	12	NO.7	FS-3	8	13
R-7	30	15	NO.12	FS-3	10	14.5

3. FINAL RIPRAP SPECIFICATIONS AS DIRECTED BY DOMINION.

CLIENT
DOMINION

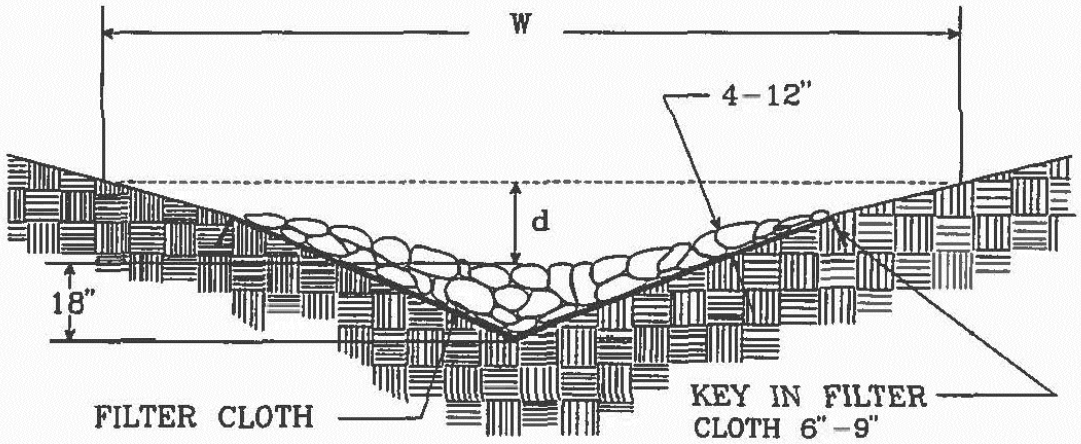
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

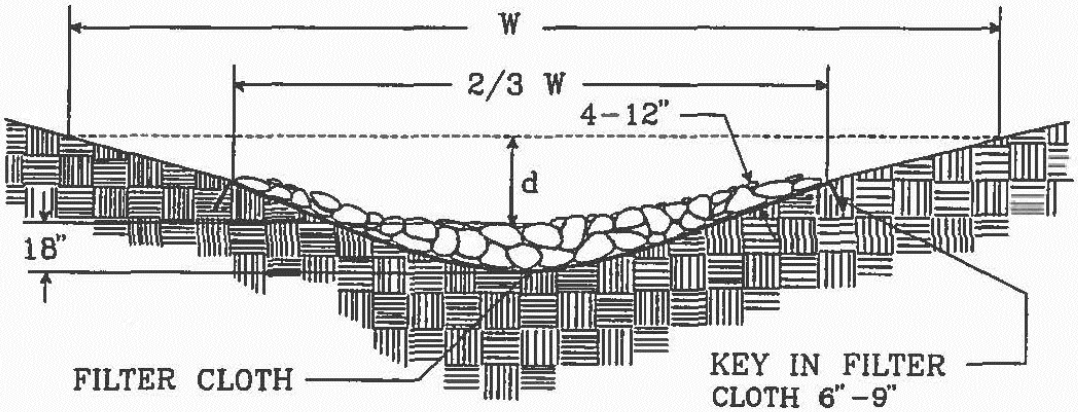
TITLE
RIPRAP GRADATIONS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6F



V–SHAPED WATERWAY WITH STONE CENTER DRAIN

NOTE: A GRANULAR FILTER MAY BE SUBSTITUTED FOR FILTER CLOTH.



PARABOLIC WATERWAY WITH STONE CENTER DRAIN

NOTE: A GRANULAR FILTER MAY BE SUBSTITUTED FOR FILTER CLOTH.

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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

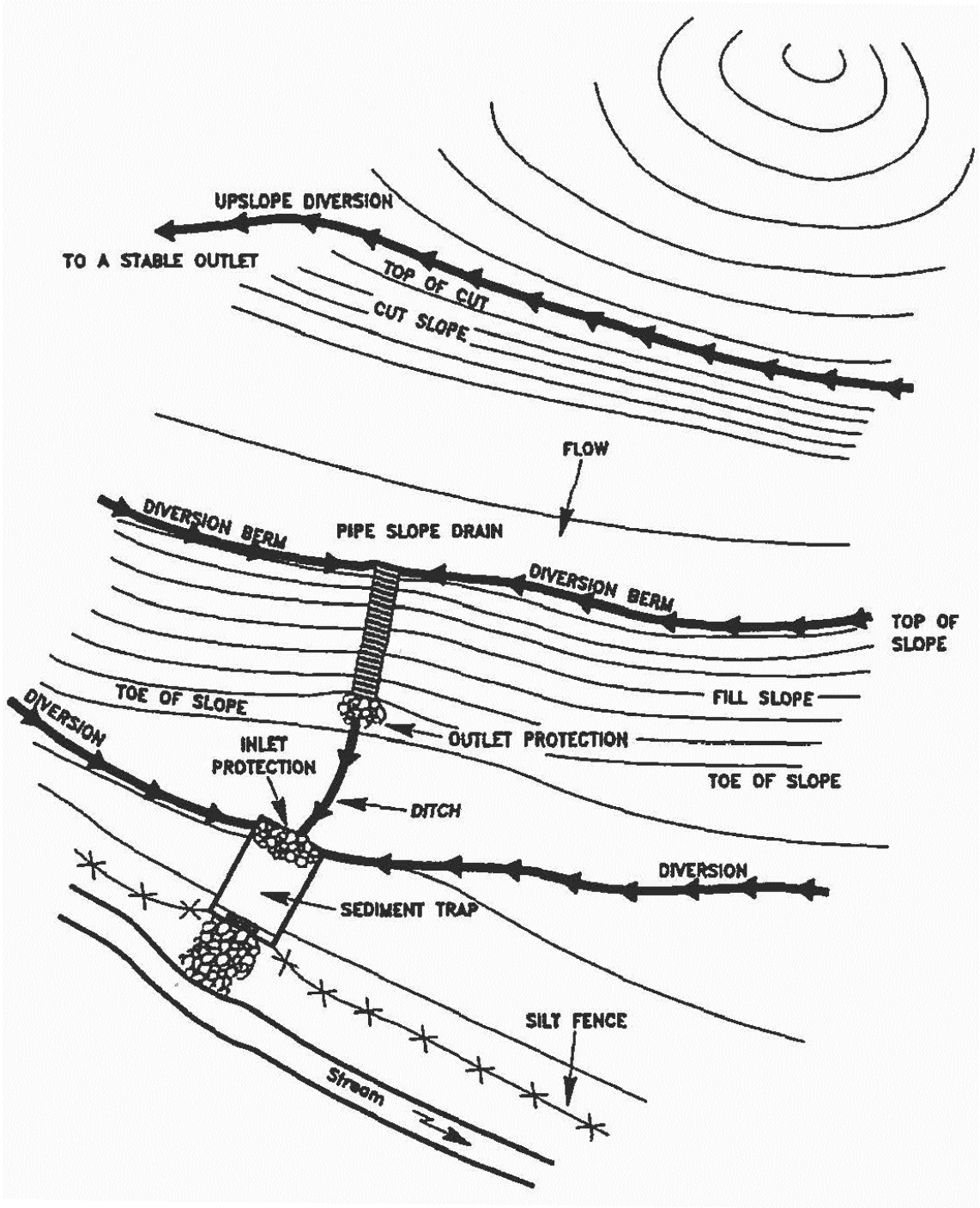
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ARMORED V-SHAPED AND U-SHAPED CHANNELS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6G



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

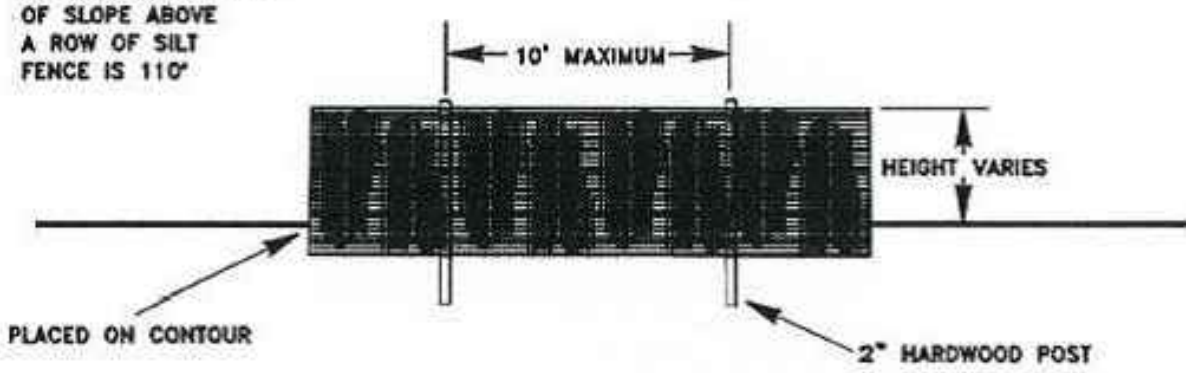
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

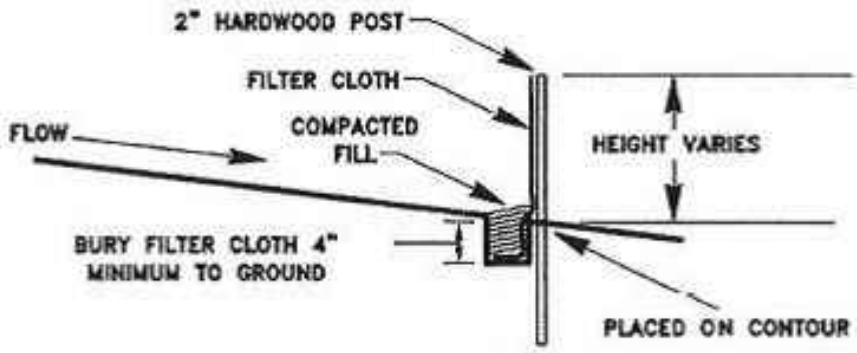
TITLE
TYP SURFACE WATER CONTROL LAYOUT

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	6H

NOTE:
THE MAXIMUM LENGTH OF SLOPE ABOVE A ROW OF SILT FENCE IS 110'



FRONT ELEVATION



SIDE ELEVATION

TOP VIEW

CLIENT
DOMINION

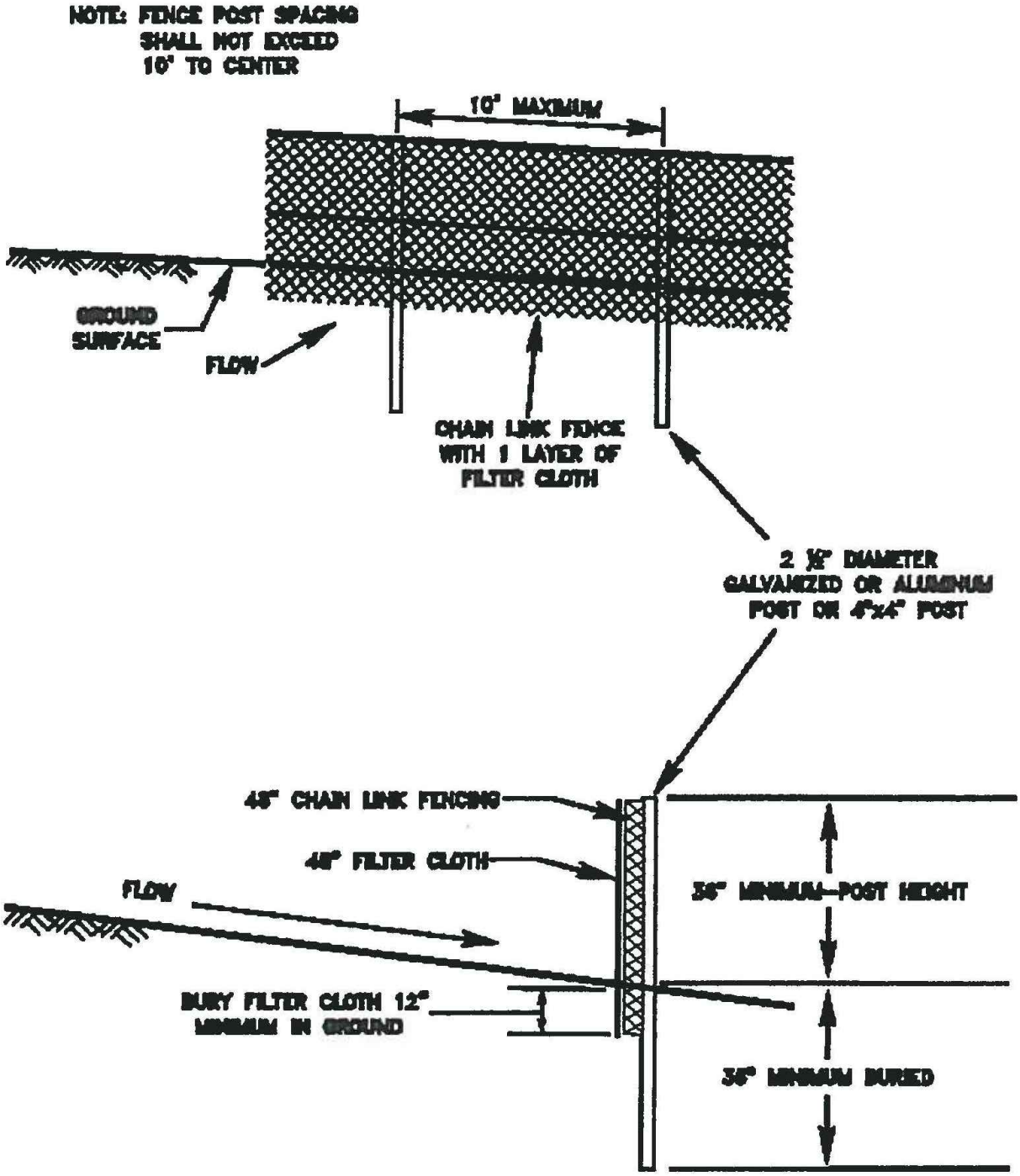
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SILT FENCE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	7A



CLIENT
DOMINION

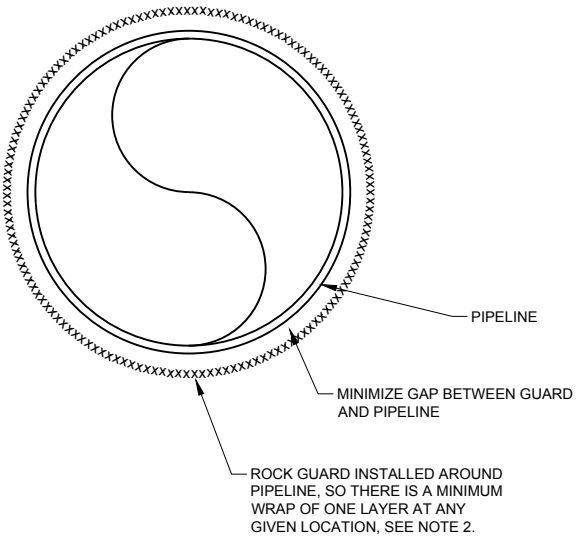
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SUPER SILT FENCE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	7B



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. SECURE ROCK GUARD PER MANUFACTURER SPECIFICATIONS , OR AS DIRECTED BY THE ENGINEER.

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PROJECT
BIC/INCREMENTAL CONTROLS

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Golder Associates

YYYY-MM-DD	2017-02-28
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DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ROCK GUARD ON PIPELINE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	8A

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. OPTIONS FOR BUOYANCY CONTROL INCLUDE THE USE OF CONCRETE COATING, SET-ON CONCRETE WEIGHTS, SET-ON BAGS FILLED ROCK MATERIALS, ANCHORS WITH BANDING OVER THE PIPELINE, OR DEEP BURIAL.

3. FINAL SELECTION OF BUOYANCY CONTROL SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION.

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PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
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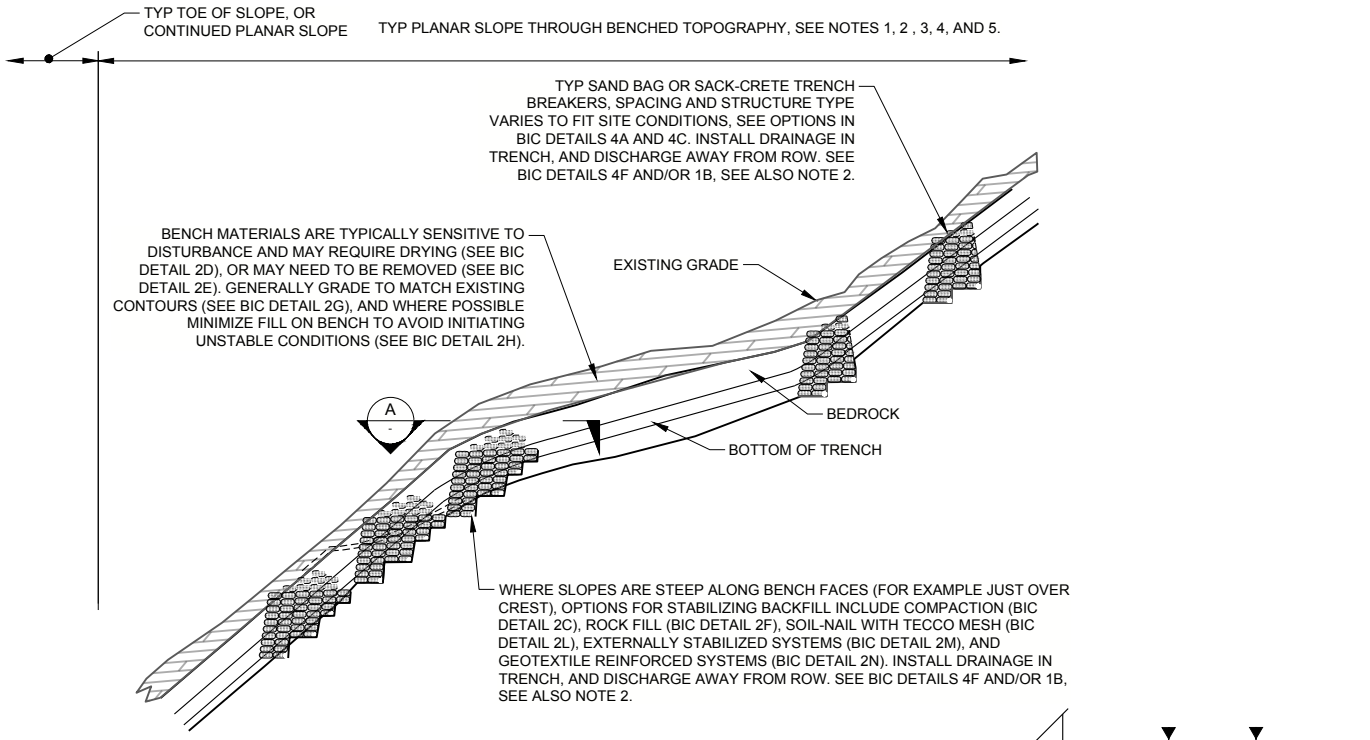
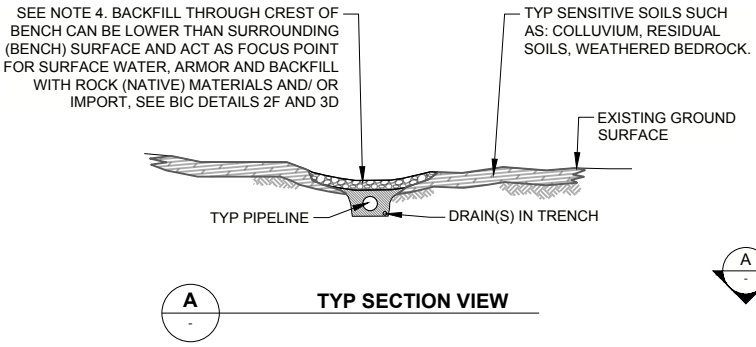
DESIGN	DBC
REVIEW	-
APPROVED	AQK

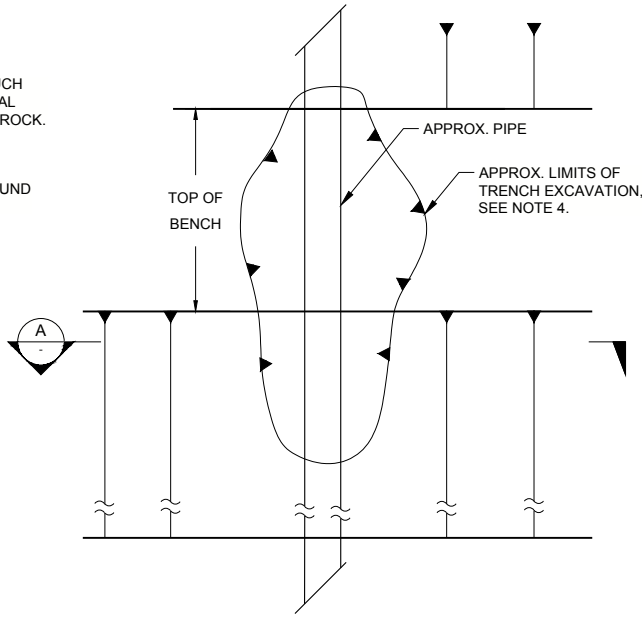
TITLE
BUOYANCY MITIGATION

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	9A





A - **TYP SECTION VIEW**



A - **TYP PLAN VIEW**

NOTE(S)

1. TRENCH EXCAVATIONS INTO SHALLOW BEDROCK IN AREAS MAY RESULT IN INSUFFICIENT AMOUNTS OF BACKFILL AND PADDING/BEDDING DUE TO LARGER, ANGULAR SPOIL MATERIAL. ROCK GUARD MATERIALS MAY BE NEEDED TO PROTECT THE PIPELINE, SEE BIC DETAIL 8A.
2. TRENCH EXCAVATIONS INTO BEDROCK IN STEEPLY SLOPED TERRAIN (PLANAR SLOPES & INCLINED RIDGES) MAY REQUIRE TRENCH BREAKERS WITH SUFFICIENT MASS AND GEOTECHNICAL PERFORMANCE TO RETAIN BACKFILL SOILS AND/OR ROCK MATERIALS. USE OF FOAM BREAKERS IN THESE CONDITIONS IS NOT RECOMMENDED.
3. ALTERNATING LAYERS OF WEAKER BEDROCK AND STRONGER BEDROCK MATERIALS OFTEN CREATES A "BENCHED" OR "STAIR-STEPPED" APPEARANCE TO EXISTING HILL SLOPES. MAINTAIN POSITIVE DRAINAGE ACROSS BENCHES WHEN RESTORING OR MODIFYING ROW CONTOURS TO ALLOW POSITIVE DRAINAGE AND TO AVOID ACCUMULATION OF WATER ON BENCH SURFACES (WHICH CAN INFILTRATE AND SATURATE LOCAL SOILS).
4. EXCAVATIONS THROUGH BENCH CREST CREATES WIDER CUT WHERE TRENCH DEPTH INCREASES, REQUIRES RESTORATION OF INCREASED DEPTH EXCAVATIONS; MAY REQUIRE SACK-CRETE BREAKERS TO BUILD AND STABILIZE BACKFILL.
5. SHALLOW BEDROCK MAY REQUIRE BLASTING, HAMMERING, AND/OR CHIPPING TO EXCAVATE ROW AND TRENCH.

CLIENT
DOMINION

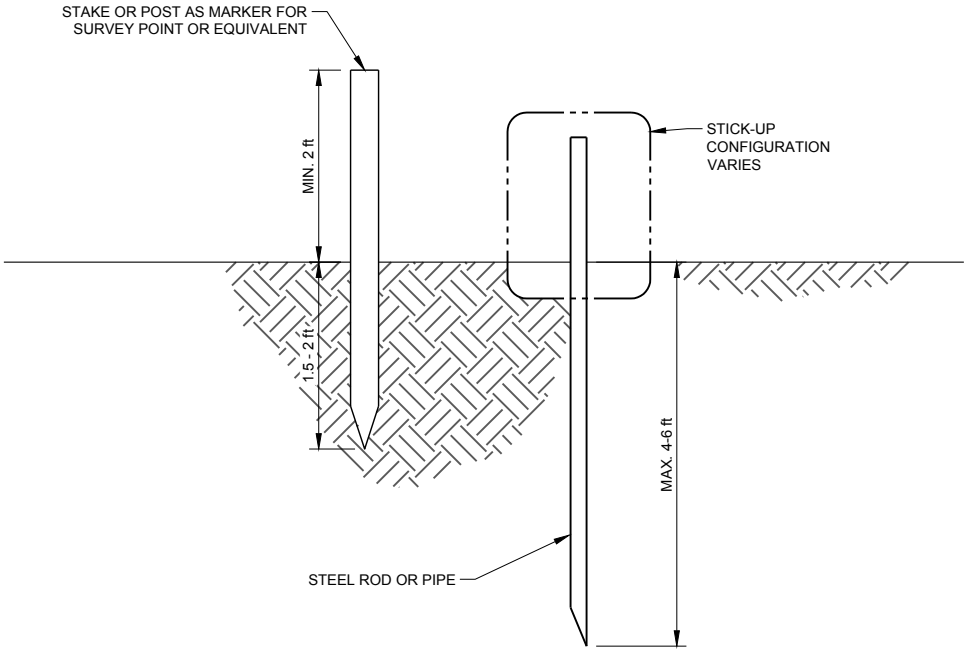
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP BENCH RE-CONSTRUCTION

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	10A



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

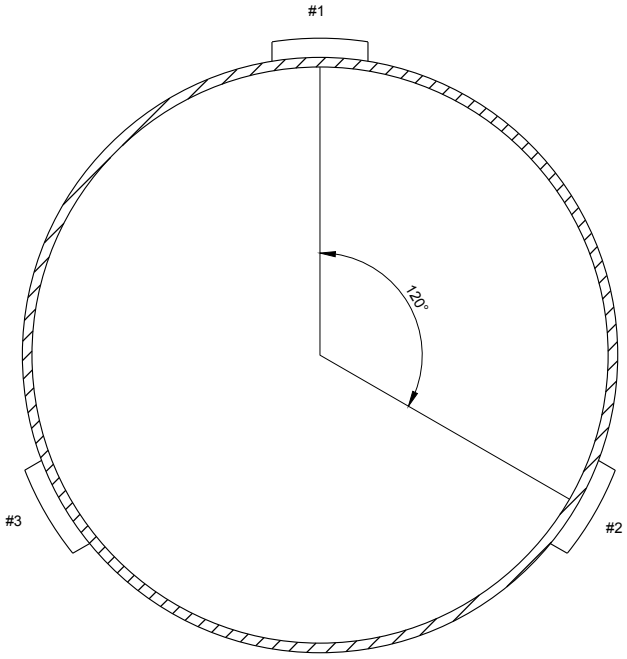
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
GEODETIC MONITORING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	11A



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

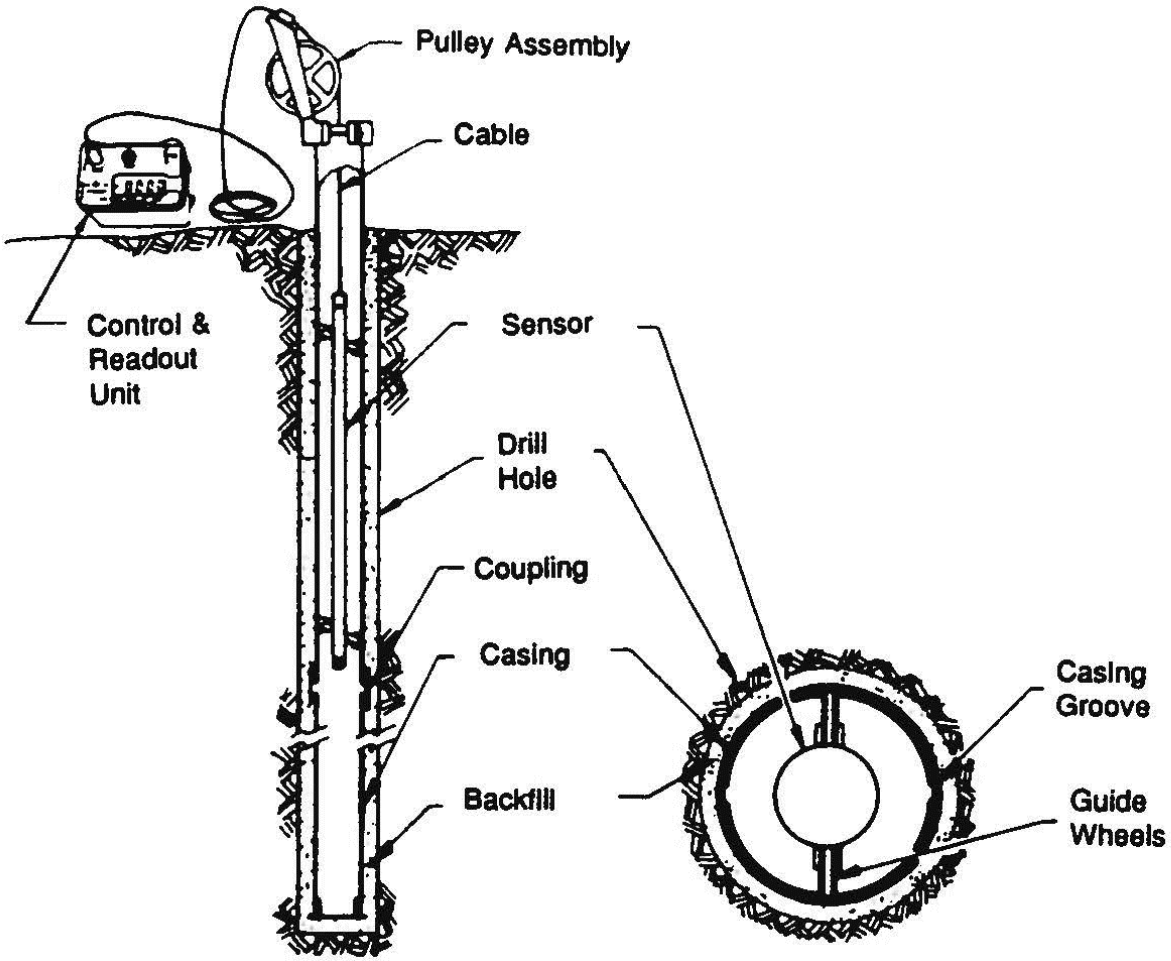
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
STRAIN GAUGE MONITORING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	11B



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

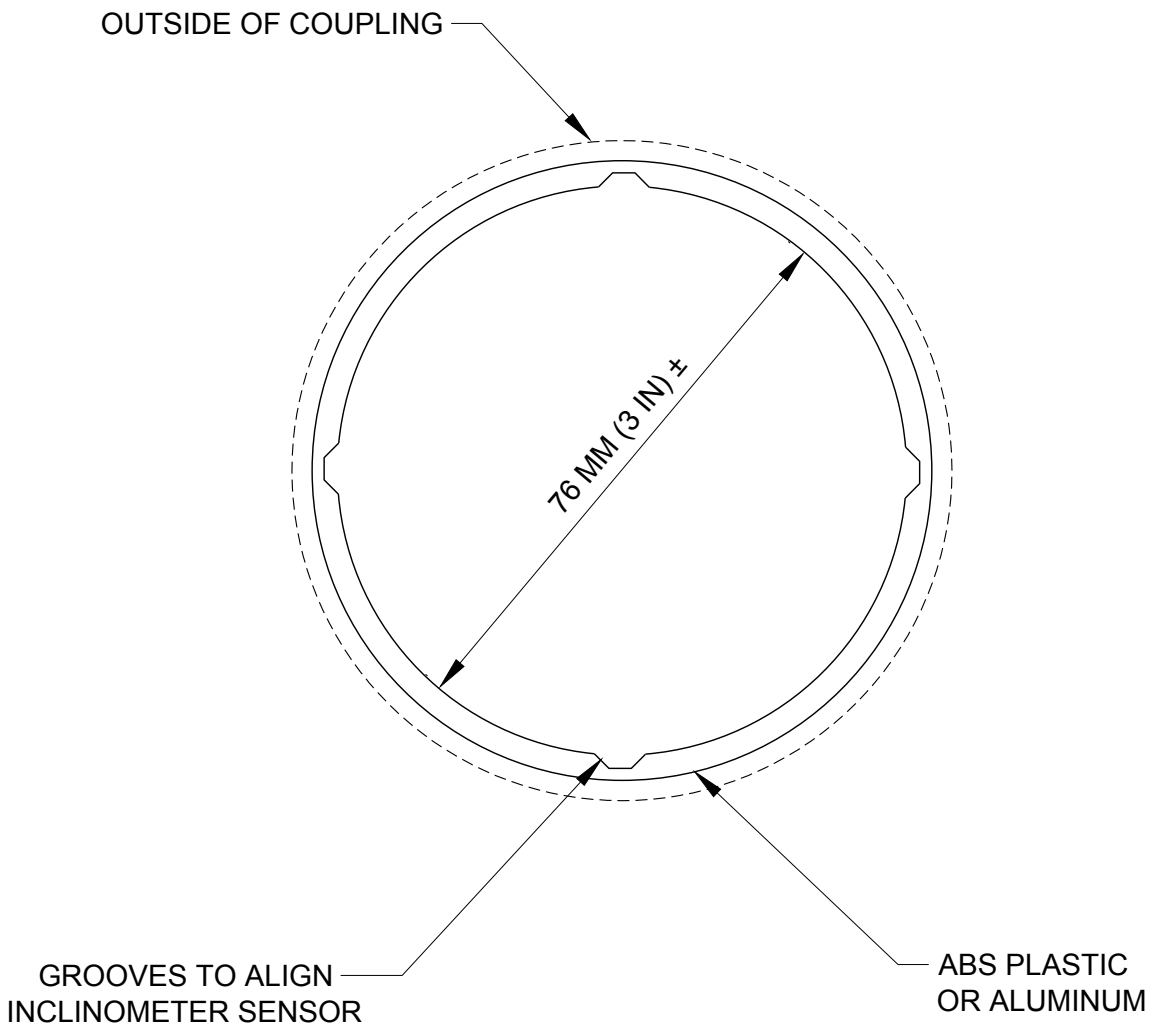
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SLOPE INCLINOMETER MONITORING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	11C



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

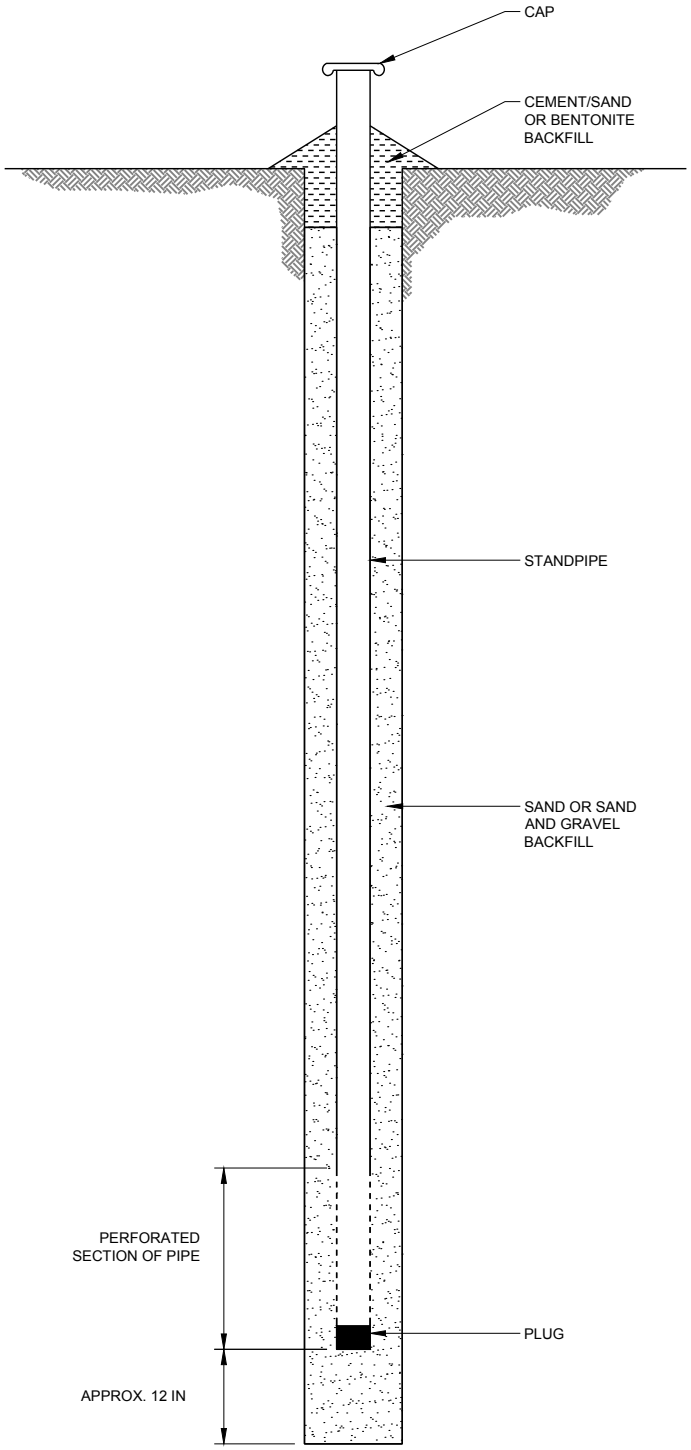
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SLOPE INCLINOMETER CASING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	11D



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
STANDPIPE PIEZOMETER MONITORING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	11E

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. COMPLETE AS-BUILT SURVEY OF INSTALLED TRENCH BREAKERS LOCATIONS, SO THAT SLOPE BREAKERS (WHICH ARE CONSTRUCTED LATER DURING ROW RESTORATION) CAN BE LOCATED TO CORRESPOND TO INSTALLED TRENCH BREAKERS. SLOPE BREAKERS TYPICALLY ARE LOCATED CLOSE TO AND JUST DOWNSLOPE OF TRENCH BREAKERS.

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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

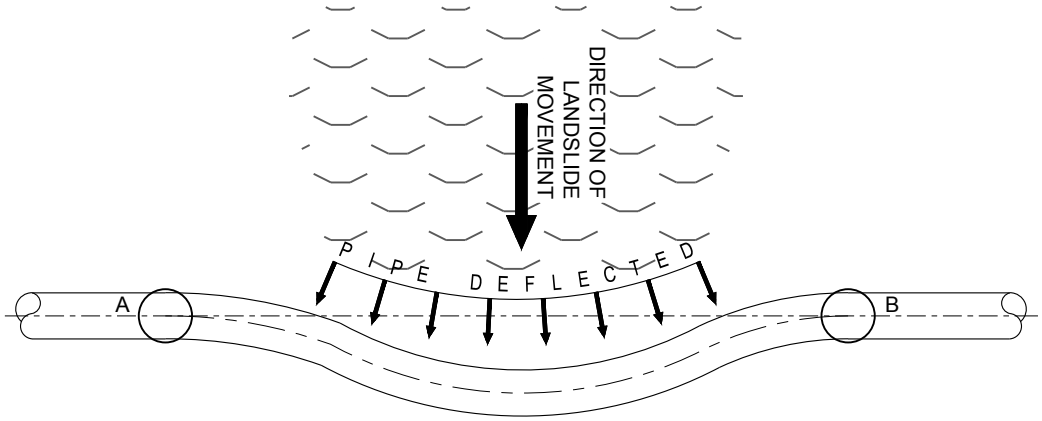
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

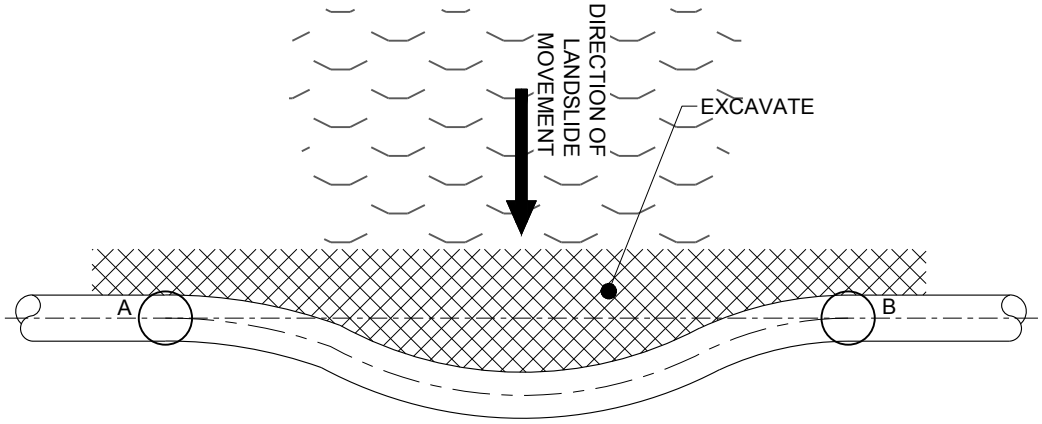
TITLE
AS-BUILT SURVEY TRENCH AND SLOPE BREAKERS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	11F

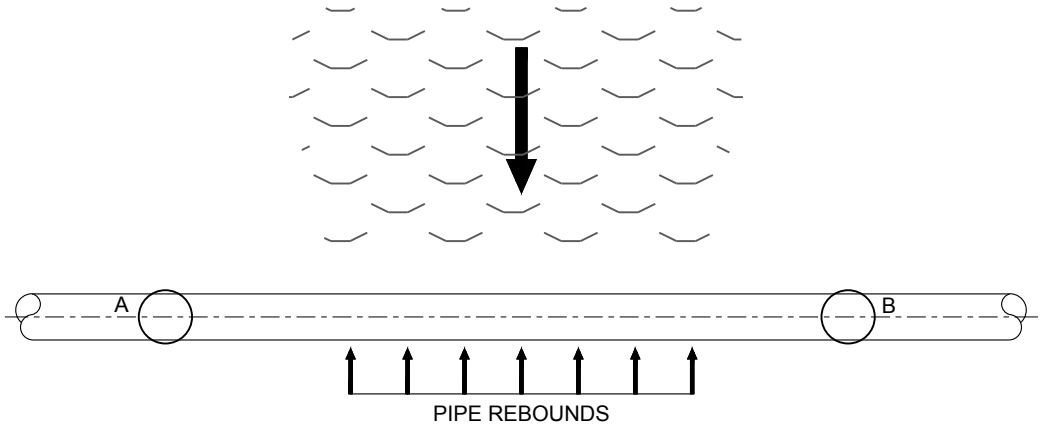
BEFORE STRAIN RELIEF EXCAVATION



DURING STRAIN RELIEF EXCAVATION



AFTER STRAIN RELIEF EXCAVATION



NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

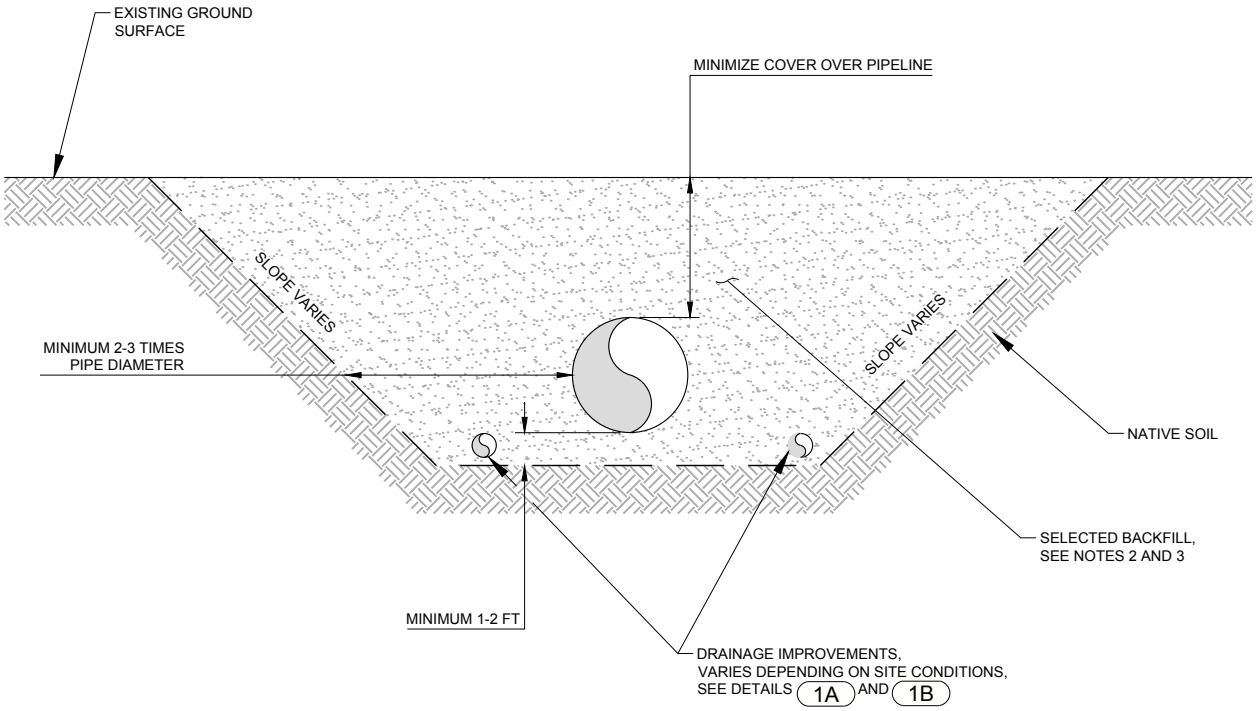
CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
STRESS RELIEF EXCAVATIONS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	12A



GRAIN SIZE TABLE

PERCENT PASSING	MINIMUM
3/8 INCH	100
U.S. NO. 4	96
8	78
16	60
30	34
50	14
100	2
200	0

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. SELECT BACKFILL SHALL CONSIST OF SANDY. INVERT GRANULAR MATERIAL, EITHER NATURALLY OCCURRING OR PROCESSED. IT SHALL BE FREE FROM ORGANICS, SILT CLAY, SWELLING SOILS, GARBAGE, WOOD, OR OTHER EXTRANEOUS OR OBJECTIONABLE MATERIAL.

3. SAND SHALL BE WELL GRADED FROM COARSE TO FINE. THE GRAIN SIZE DISTRIBUTION SHALL CONFORM TO THE FOLLOWING.

CLIENT
DOMINION

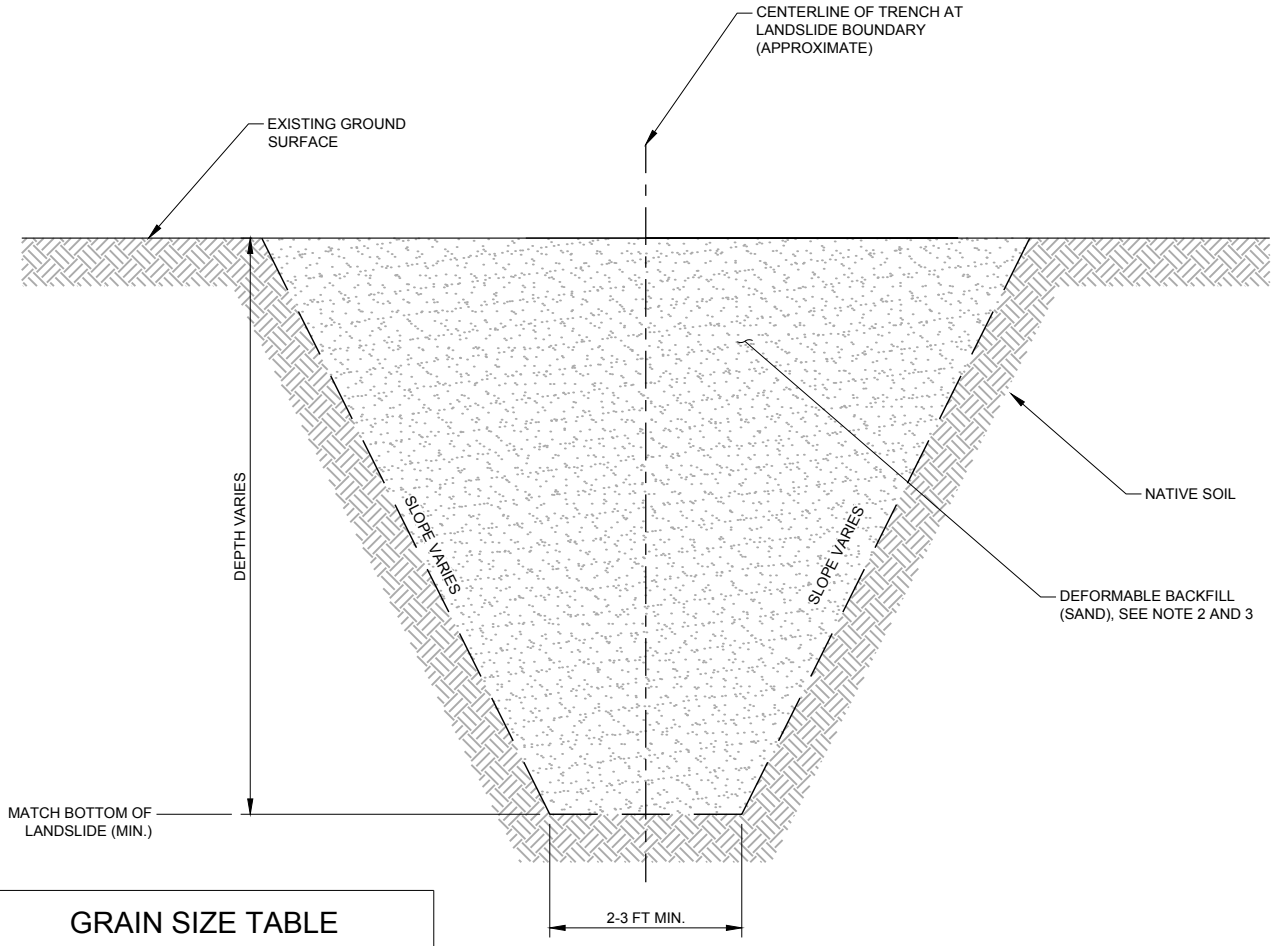
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SELECT (DEFORMABLE) BACKFILL AROUND PIPELINE IN LANDSLIDE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	12B



GRAIN SIZE TABLE

PERCENT PASSING	MINIMUM
$\frac{3}{8}$ INCH	100
U.S. NO. 4	96
8	78
16	60
30	34
50	14
100	2
200	0

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. SELECT BACKFILL SHALL CONSIST OF SANDY. INVERT GRANULAR MATERIAL, EITHER NATURALLY OCCURRING OR PROCESSED. IT SHALL BE FREE FROM ORGANICS, SILT CLAY, SWELLING SOILS, GARBAGE, WOOD, OR OTHER EXTRANEOUS OR OBJECTIONABLE MATERIAL.

3. SAND SHALL BE WELL GRADED FROM COARSE TO FINE. THE GRAIN SIZE DISTRIBUTION SHALL CONFORM TO THE FOLLOWING.

CLIENT
DOMINION

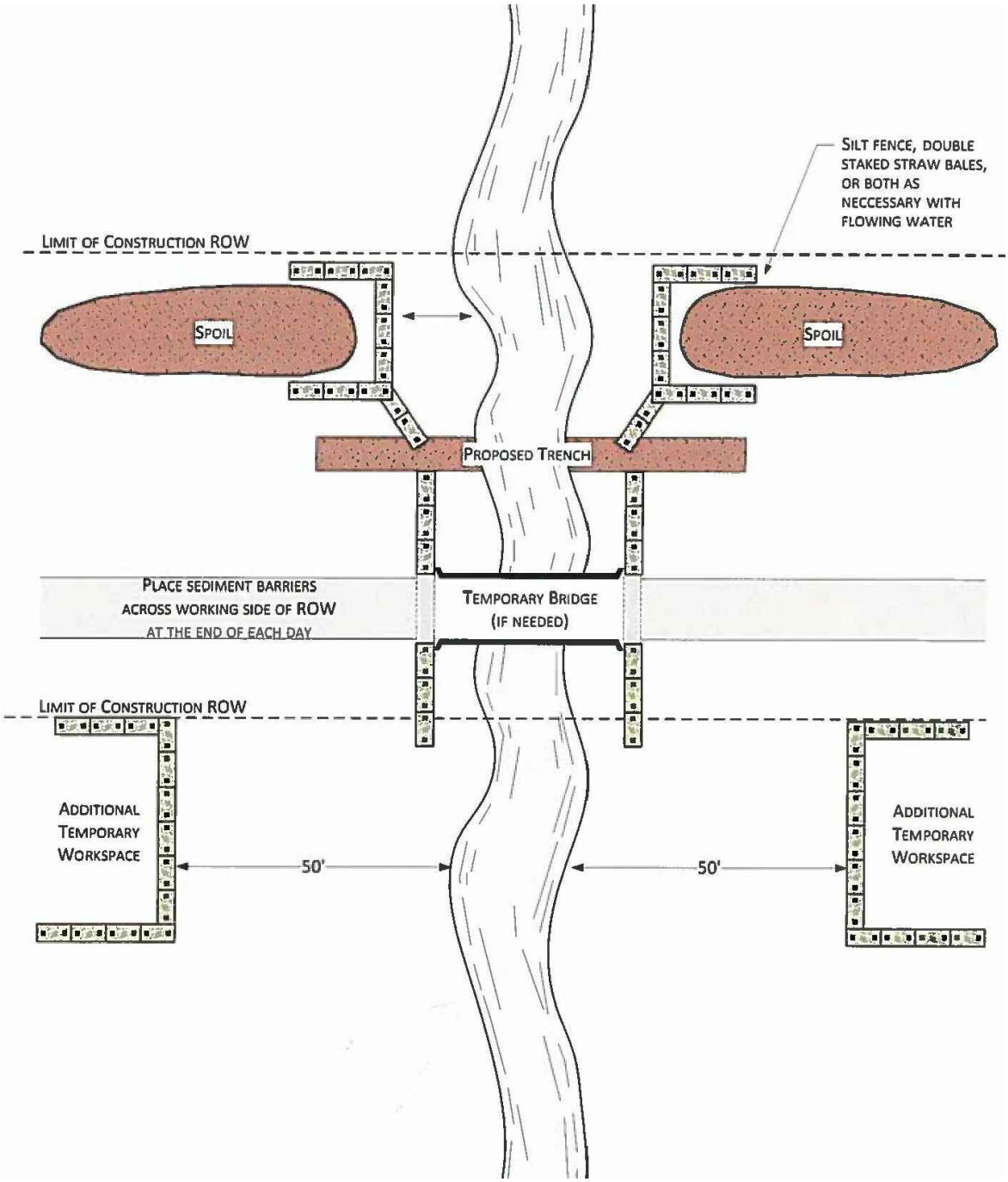
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SHEAR TRENCH

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	12C



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

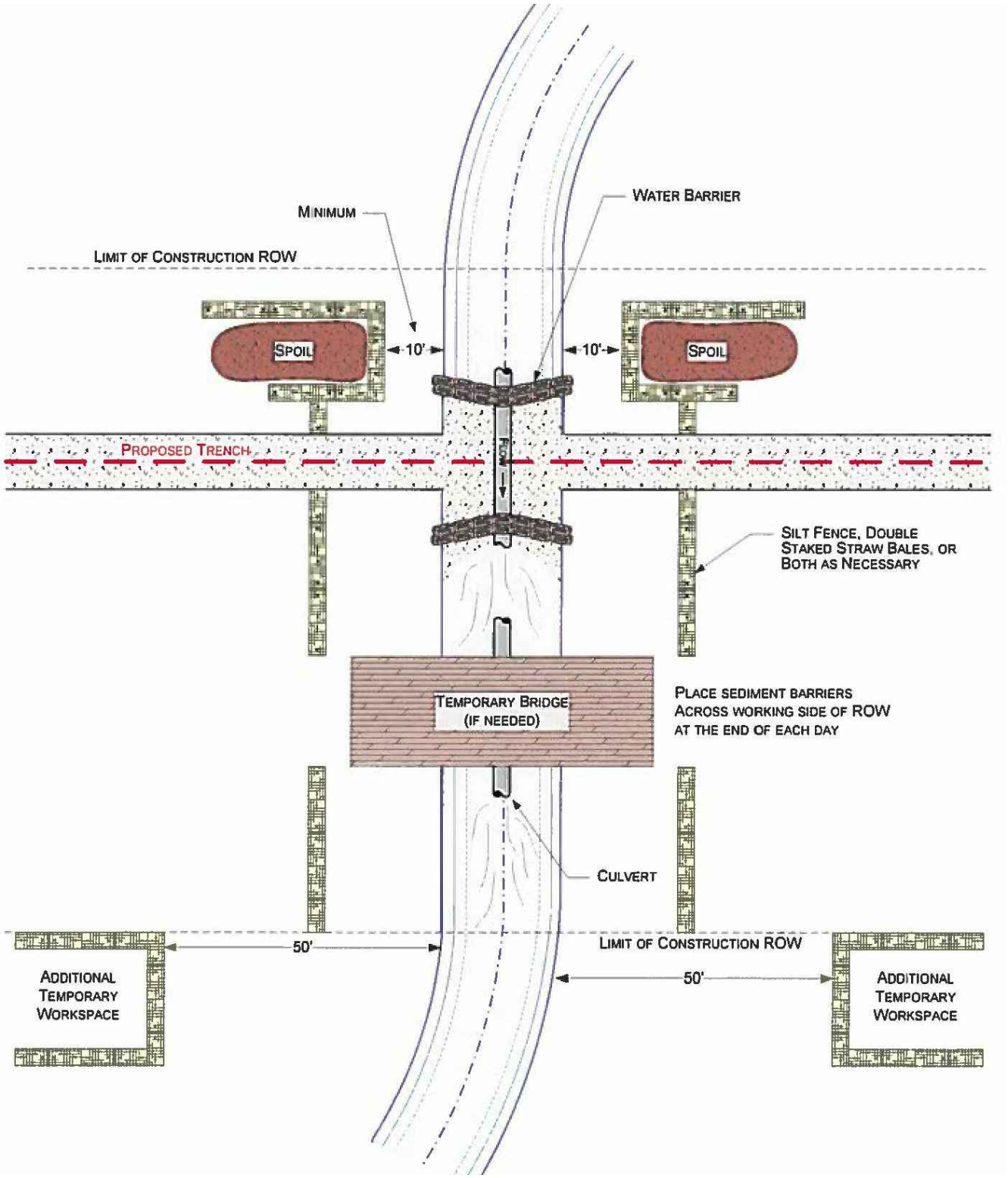
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP WATERBODY OPEN CUT

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13A

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
0 1in



CLIENT
DOMINION

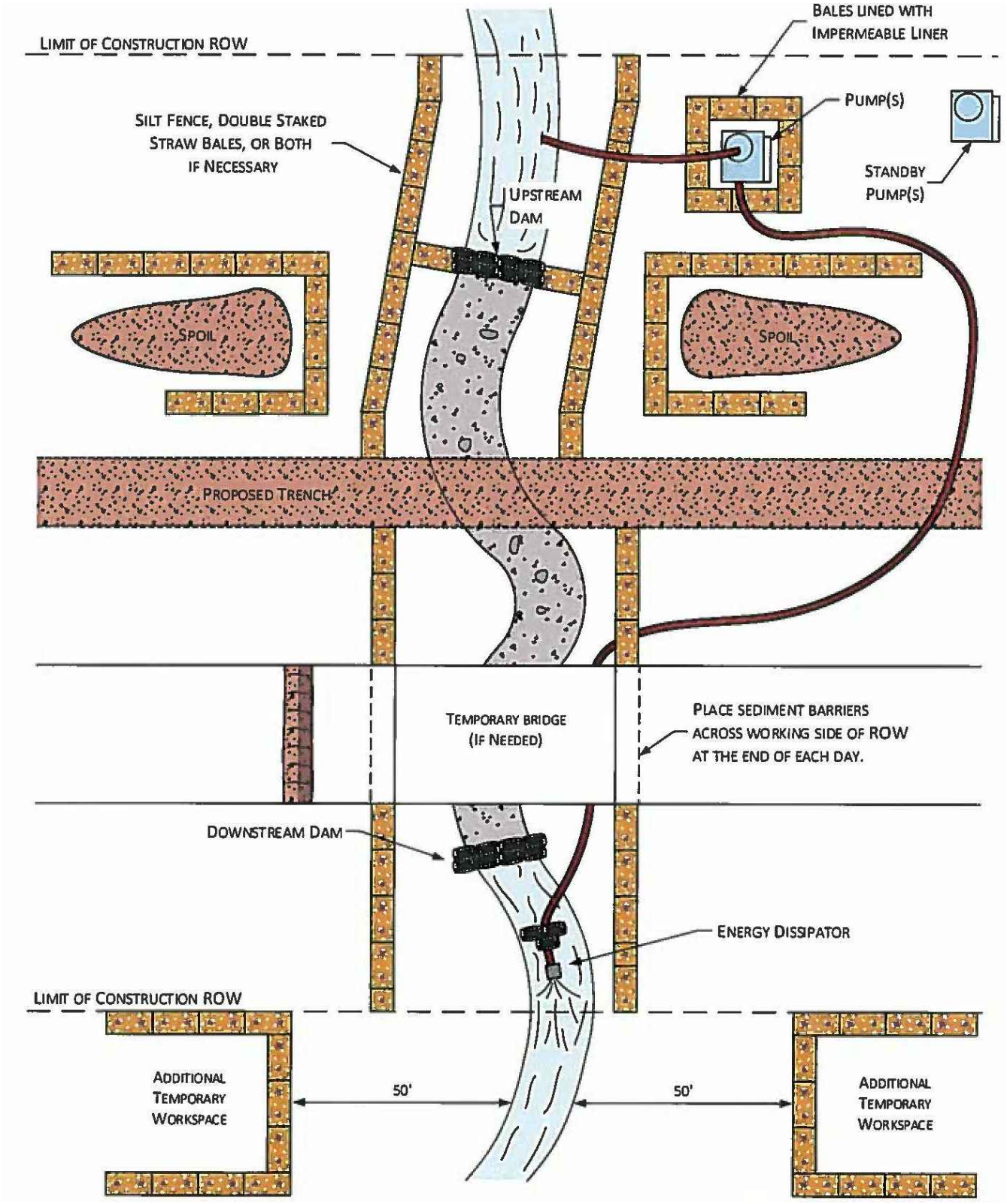
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP WATERBODY FLUME METHOD

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13B



CLIENT
DOMINION

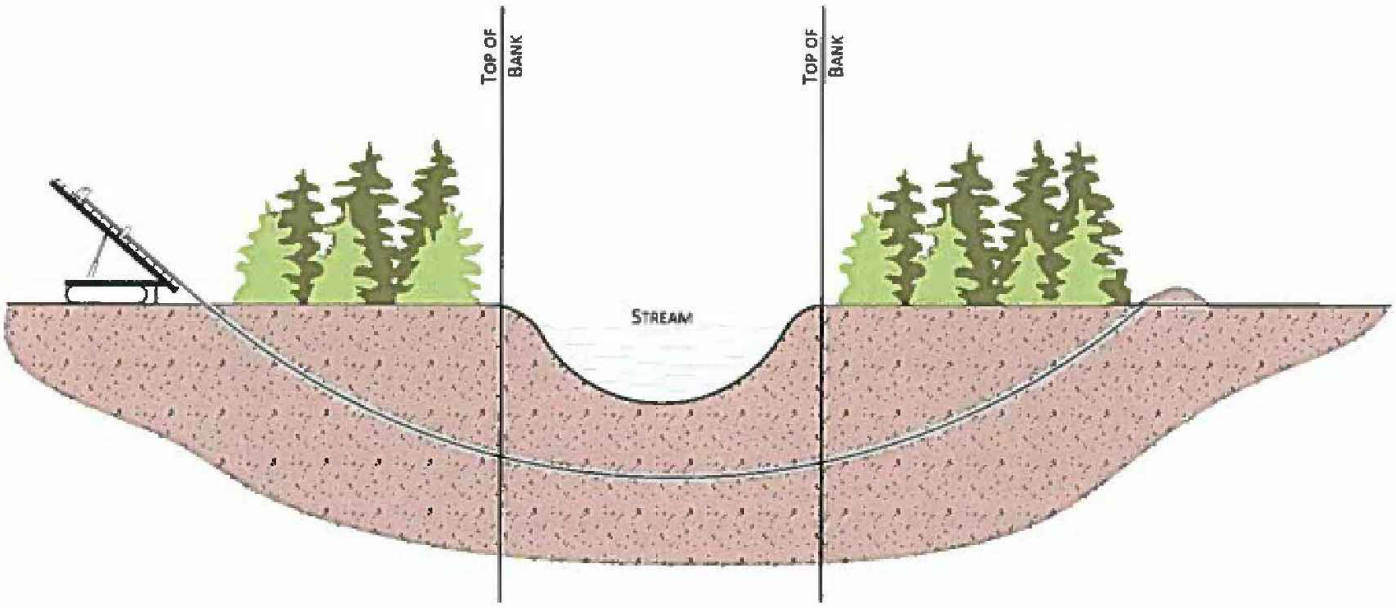
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP WATERBODY DAM AND PUMP

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13C



CLIENT
DOMINION

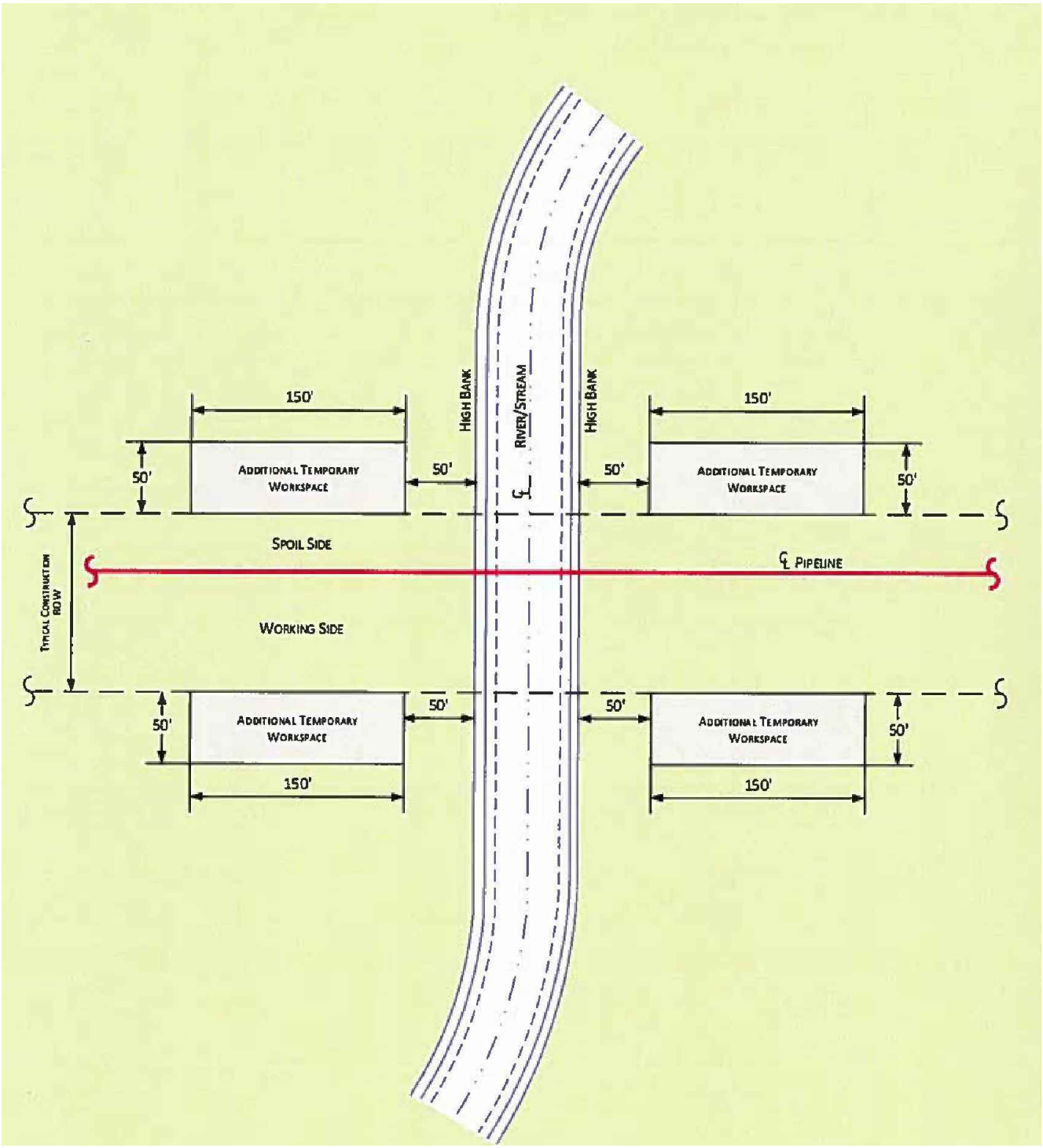
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP WATERBODY HDD METHOD

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13D



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

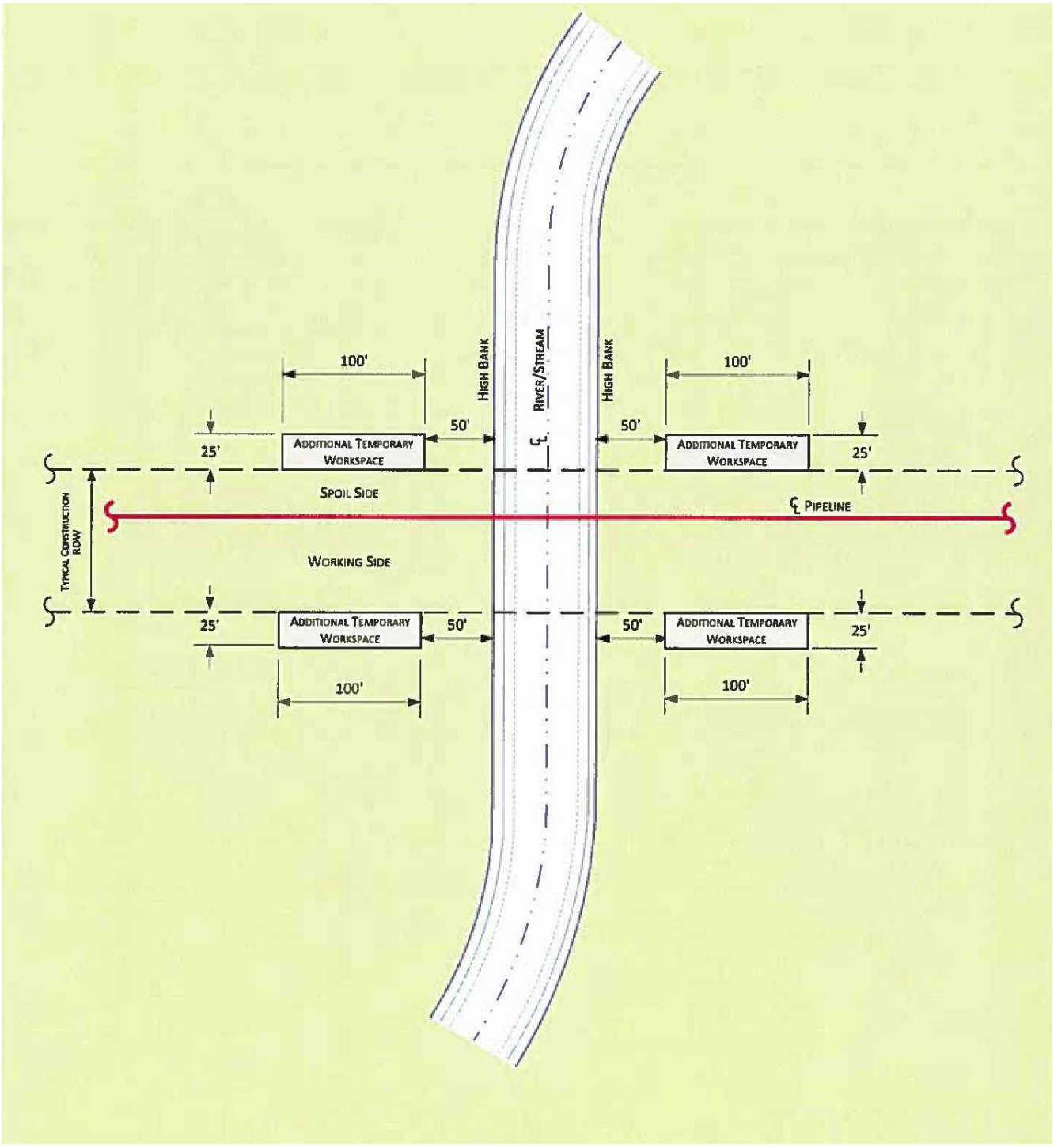
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT WATERBODY ACP AP-1

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13E-1

0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



CLIENT
DOMINION

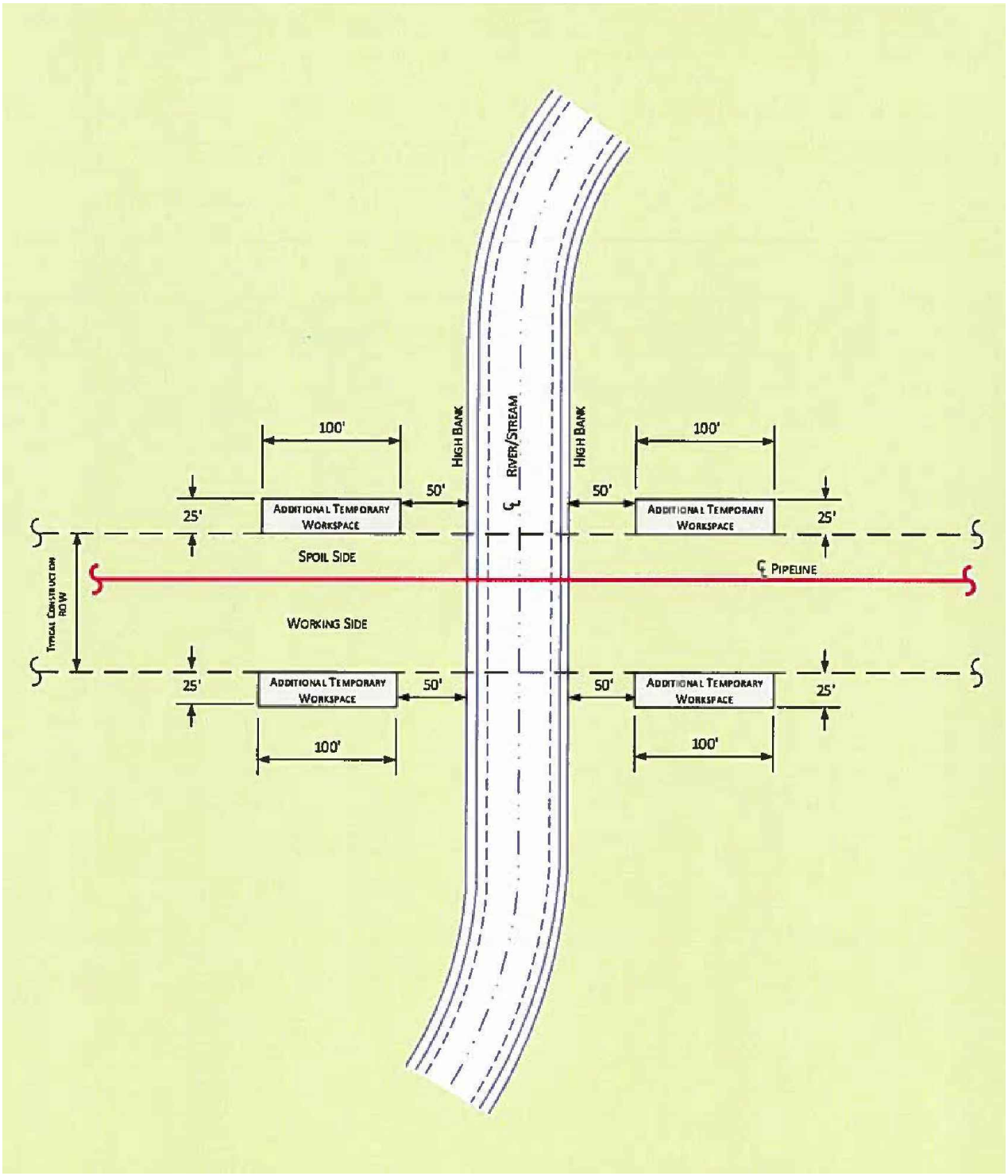
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT WATERBODY ACP AP-1 AP-2 AP-3 AP-4 AP-5

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13E-2



CLIENT
DOMINION

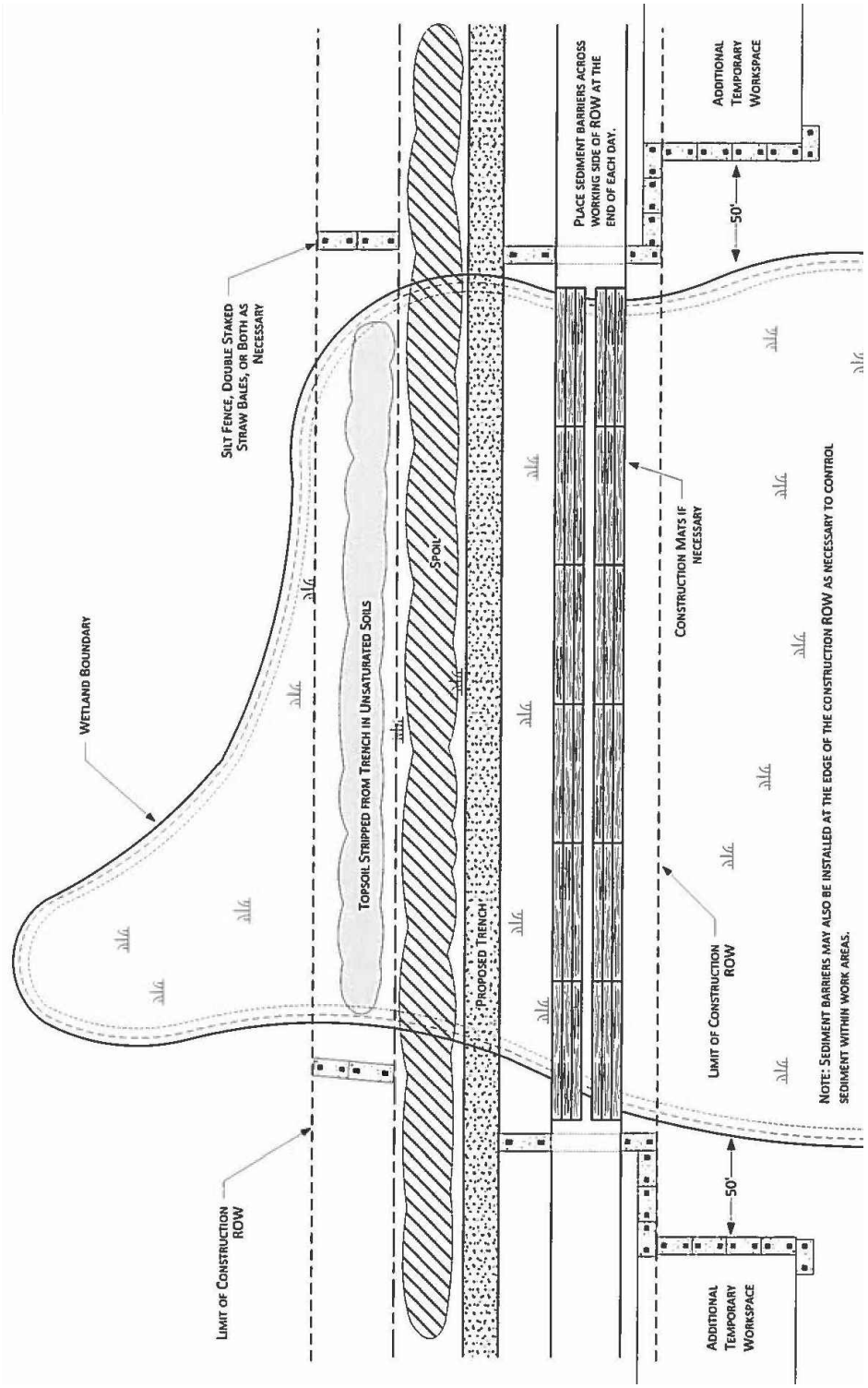
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT WATERBODY SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13E-3



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

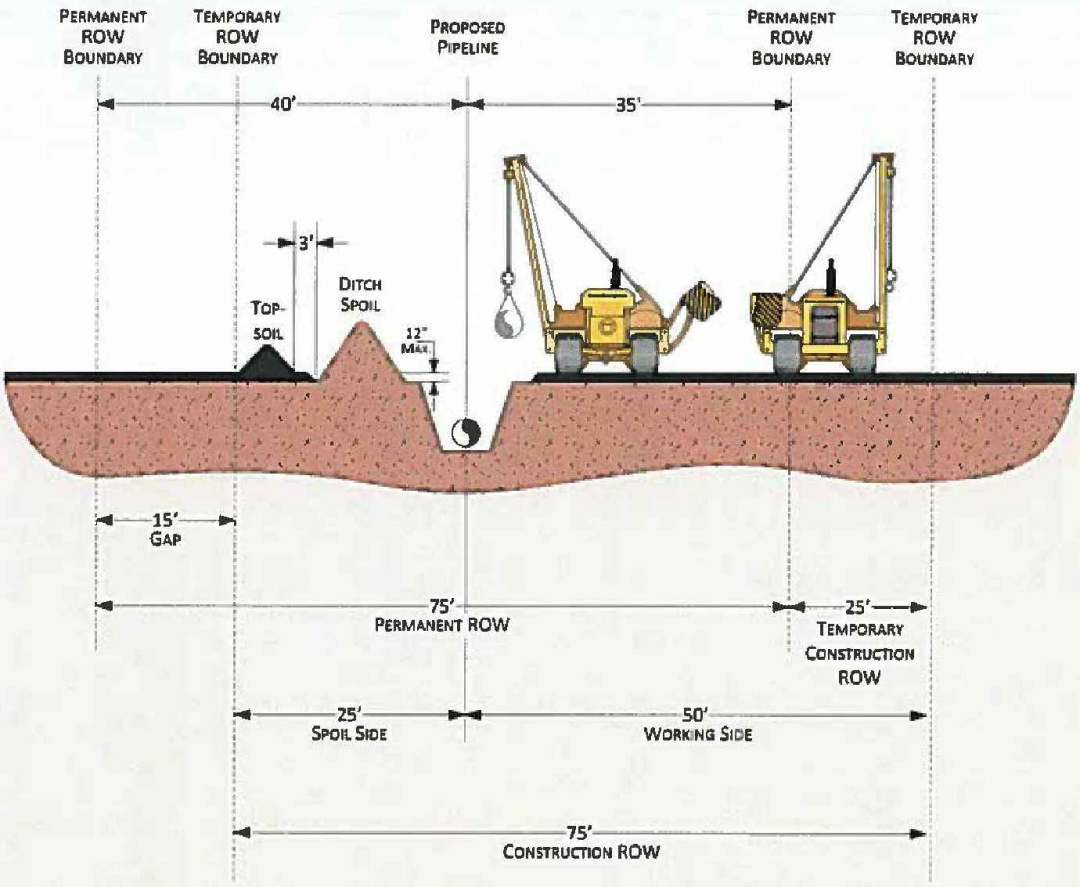
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP WETLAND OPEN CUT METHOD ACP AP-1 AP-2 AP-3 AP-4 AP-5

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13F

0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75' WIDE WITH 25' ON THE SPOIL SIDE AND 50' ON THE WORKING SIDE. THE PERMANENT ROW WILL BE 75' WIDE WITH 40' ON THE SPOIL SIDE AND 35' ON THE WORKING SIDE. THIS WILL LEAVE A 15' GAP BETWEEN THE AREA OF DISTURBANCE DURING CONSTRUCTION AND THE BOUNDARY OF THE PERMANENT ROW. NO IMPACT IS EXPECTED IN THIS AREA.
2. DURING CONSTRUCTION, A WORKING SIDE OF 50 FEET IN WETLANDS WILL BE NECESSARY GIVEN THE DIAMETER OF THE PIPE.
3. DURING OPERATIONS, ATLANTIC PROPOSES A STANDARD PERMANENT EASEMENT IN WETLANDS CONSISTENT WITH OTHER SEGMENTS OF THE PIPELINE. MAINTENANCE ACTIVITIES IN THE PERMANENT EASEMENT WILL BE CONSISTENT WITH THE PROCEDURES.

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DOMINION

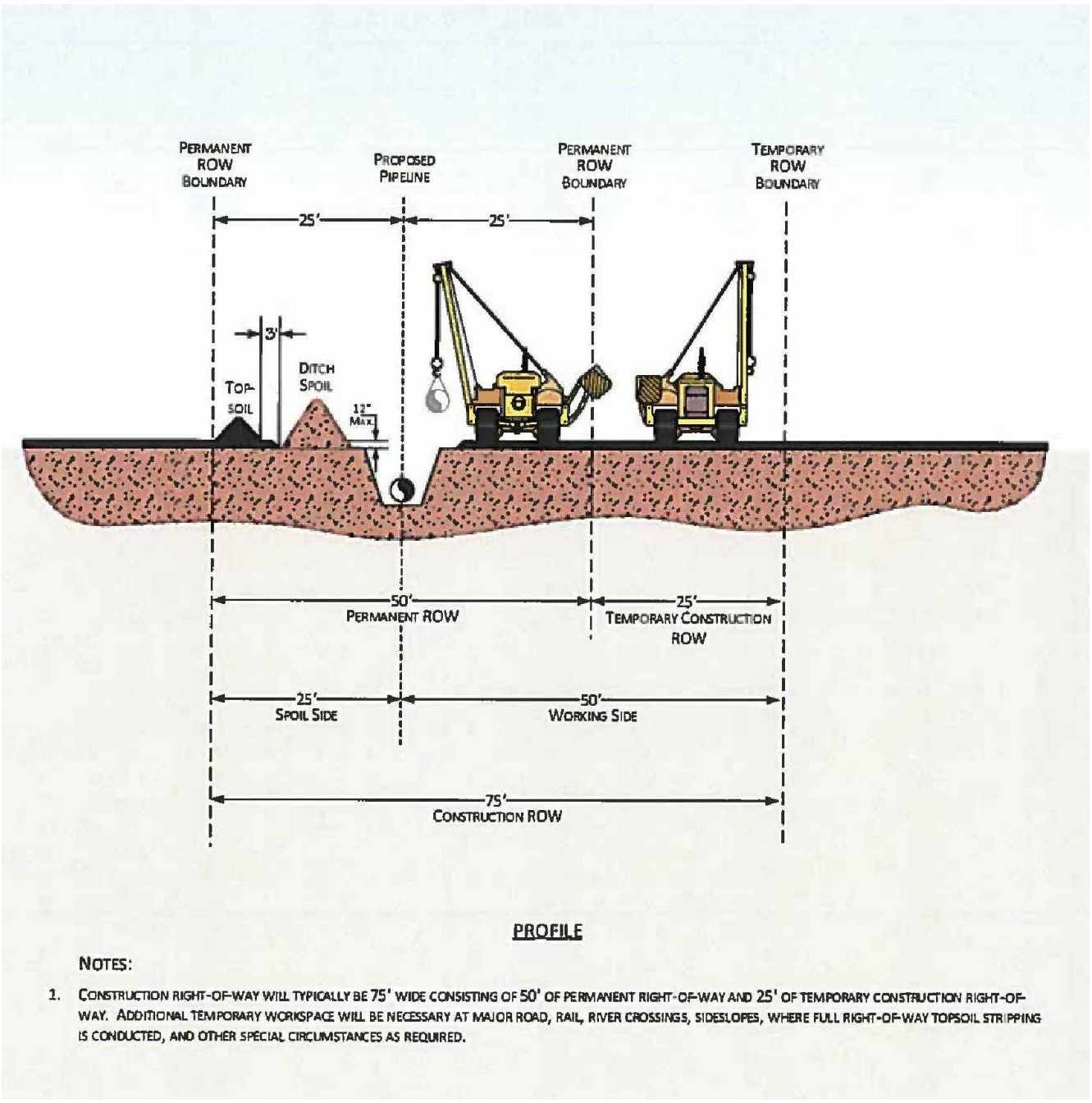
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN WETLANDS ACP AP-1

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13G-1



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 25' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

CLIENT
DOMINION

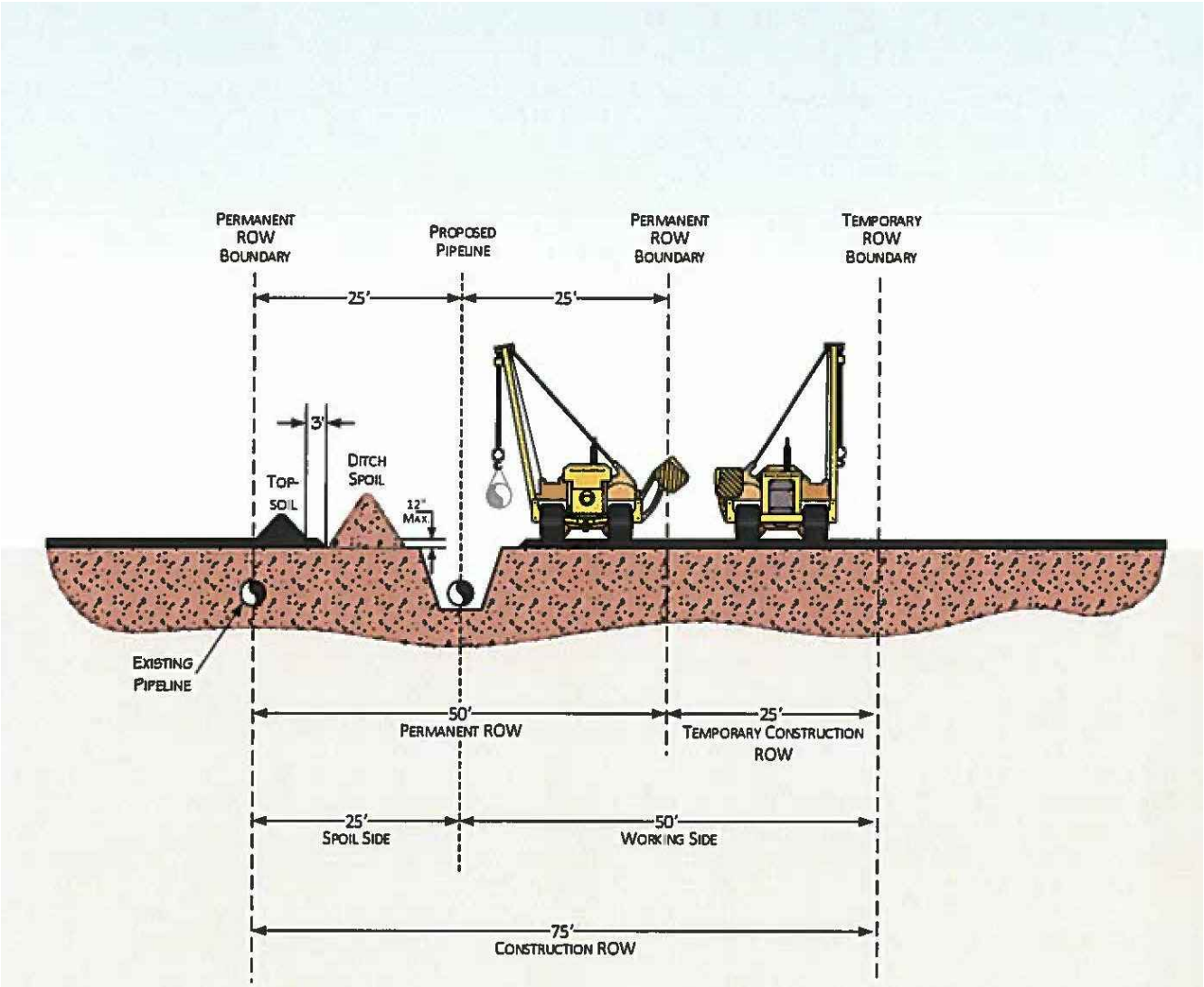
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN WETLANDS ACP AP-2

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13G-2



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 25' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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DOMINION

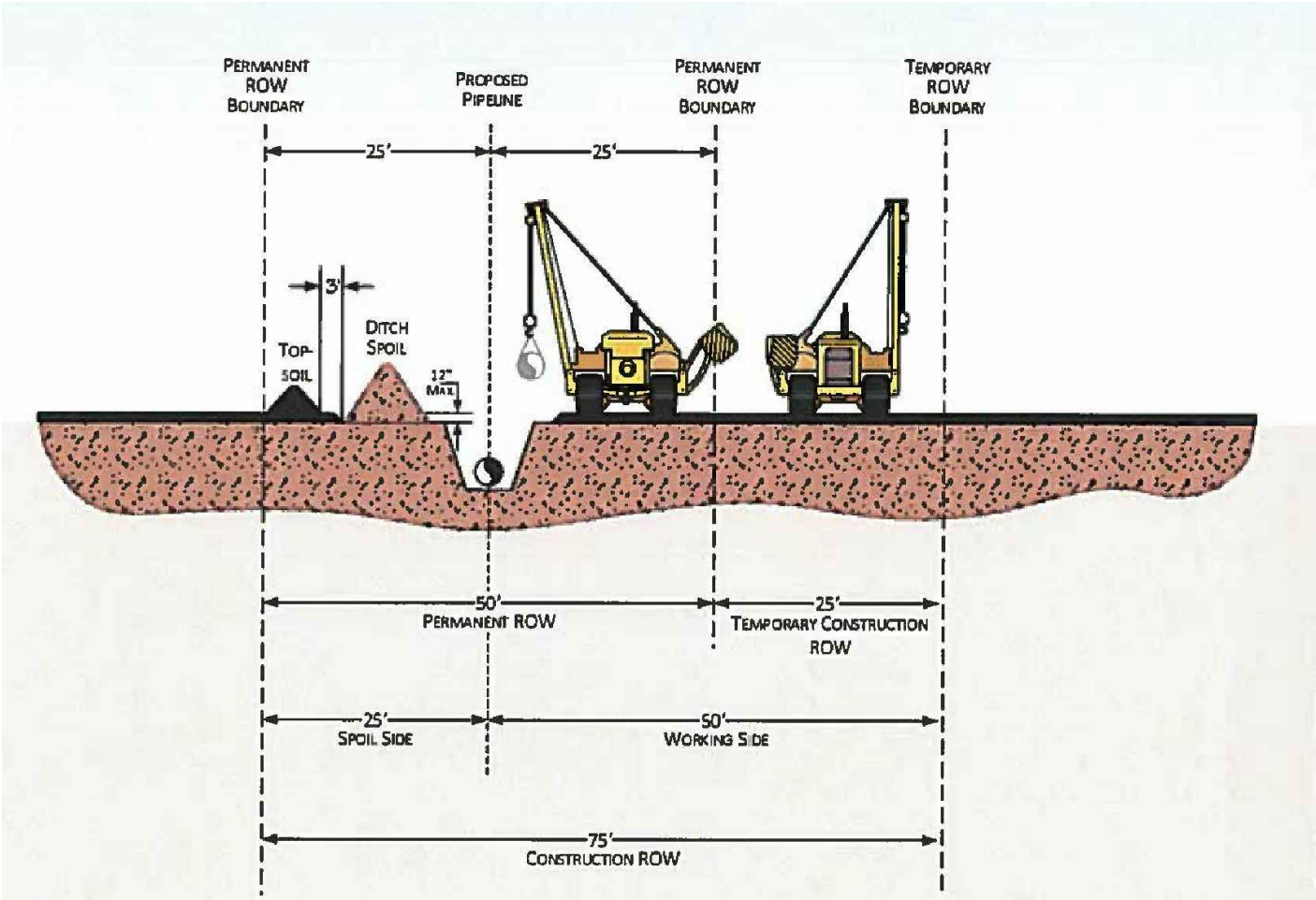
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN WETLANDS COLLOCATED SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13G-3



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 25' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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DOMINION

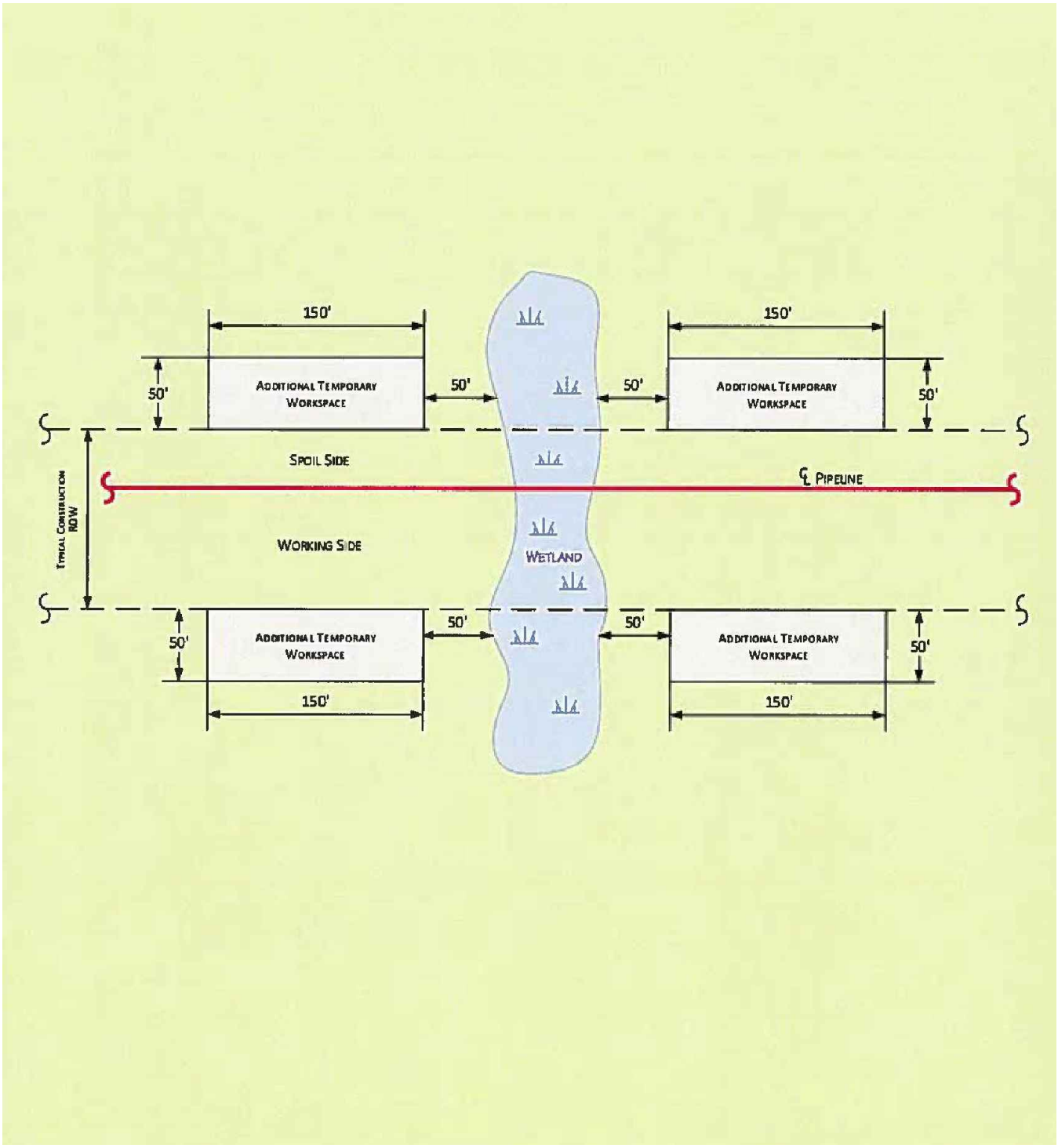
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN WETLANDS NOT-COLLOCATED SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13G-4



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

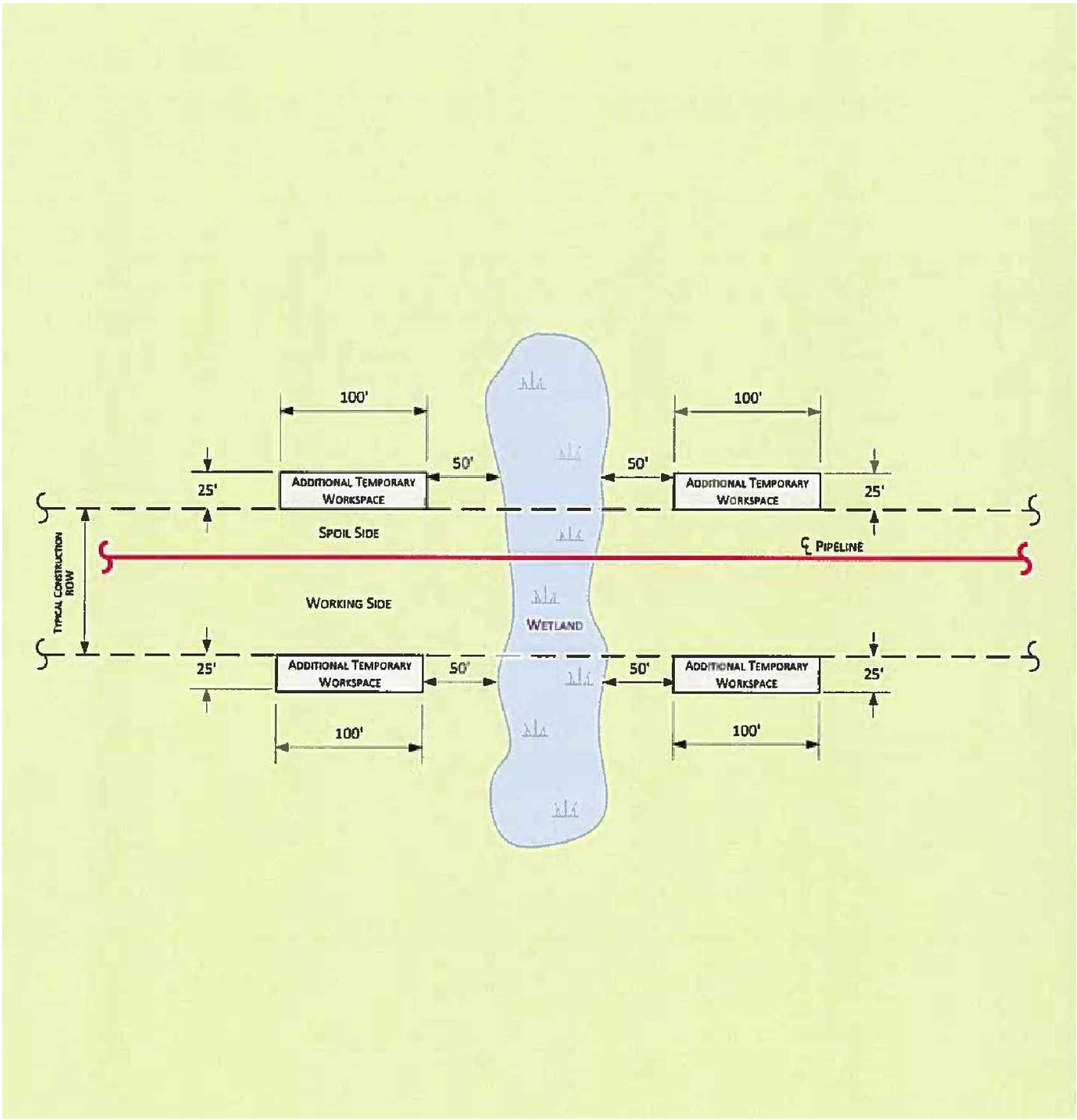
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT WETLAND CROSSINGS ACP AP-1

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13H-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
0 1in



CLIENT
DOMINION

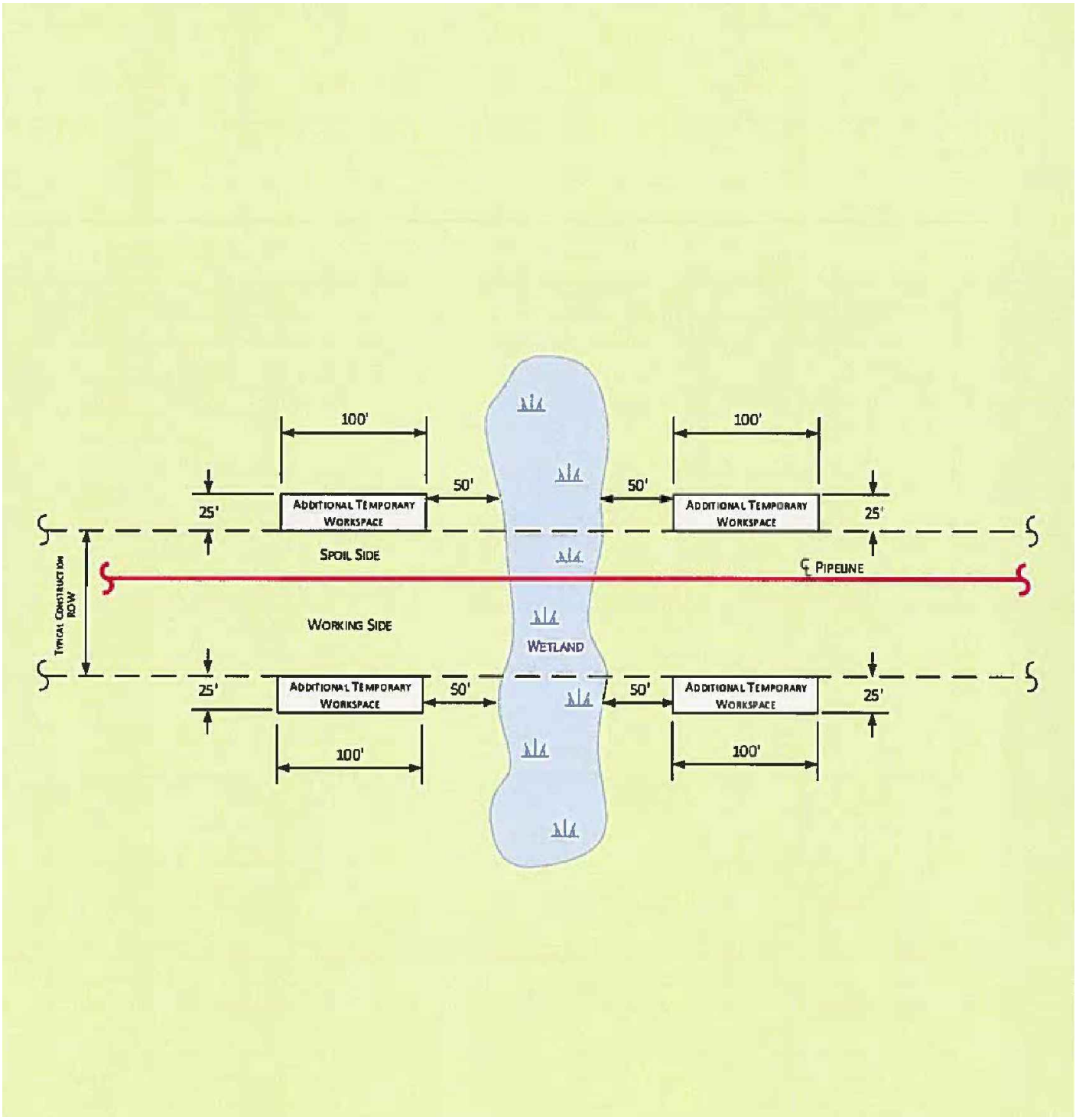
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT WETLAND CROSSINGS ACP AP-2 AP-3 AP-4 AP-5

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13H-2



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

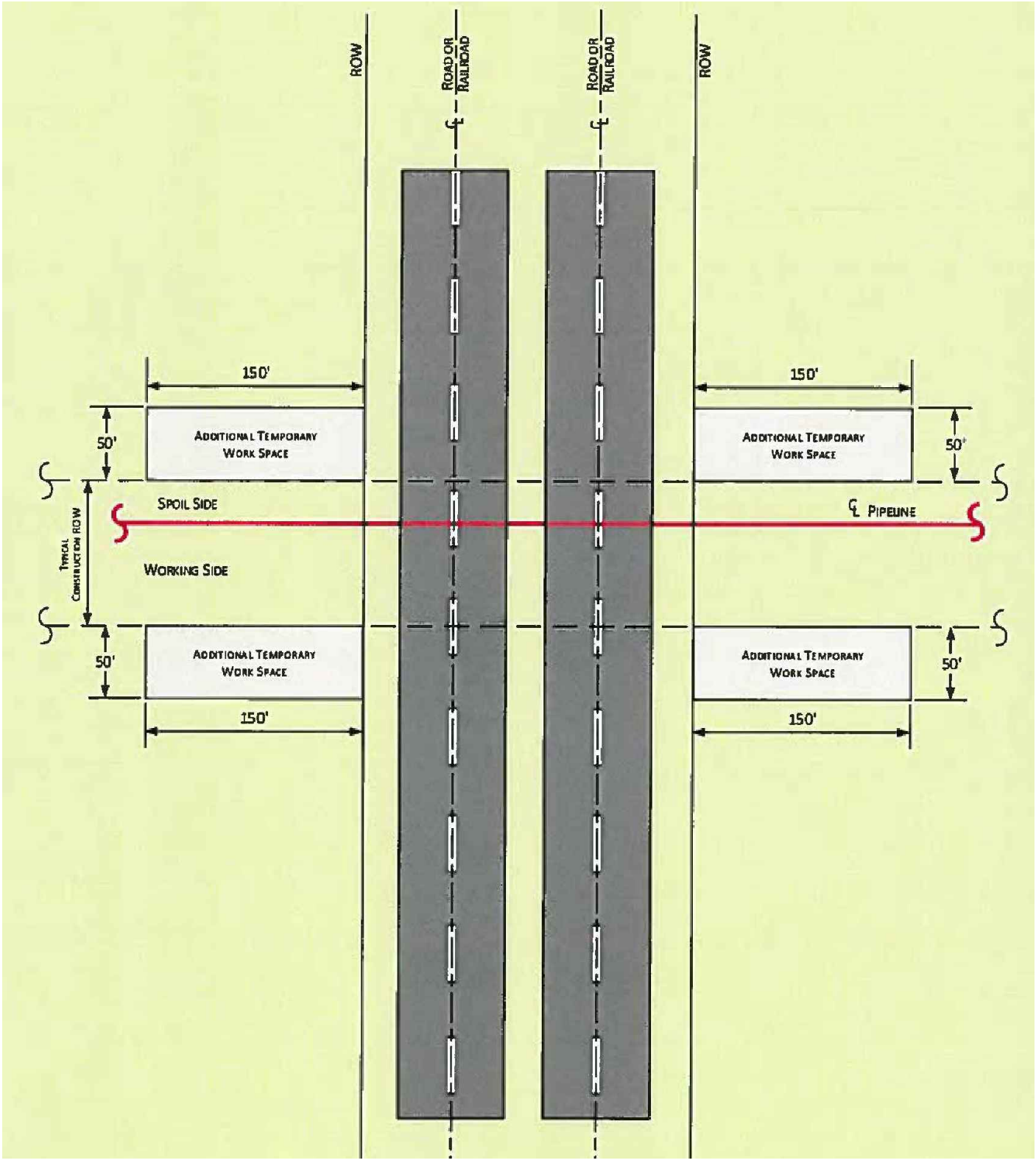
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT WETLAND CROSSINGS SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13H-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
0 1in



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

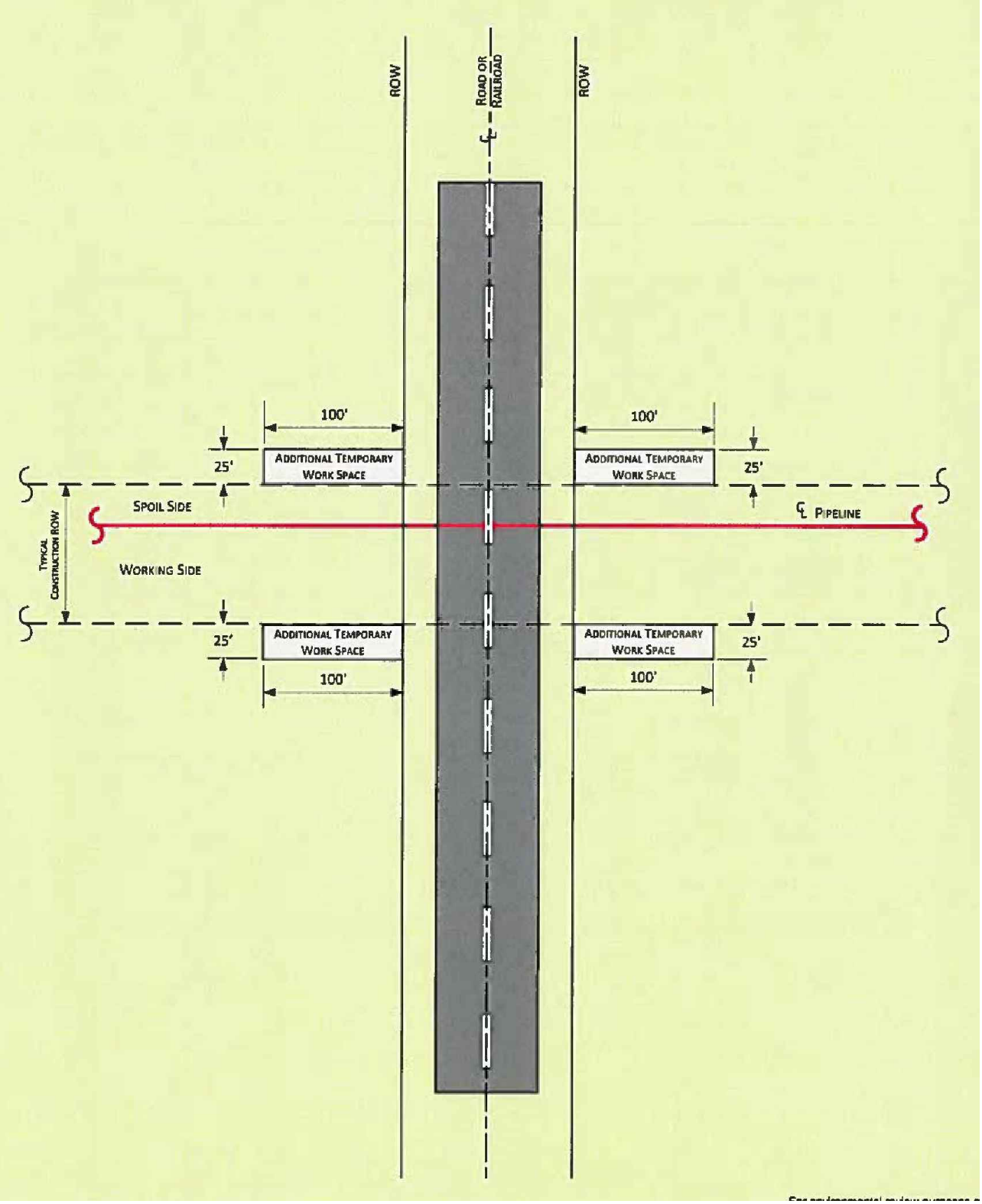
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
WORKSPACE AT BORED CROSSINGS FOR 2-LANE ROADS AND RAILROADS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13I-1

0 1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A



CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

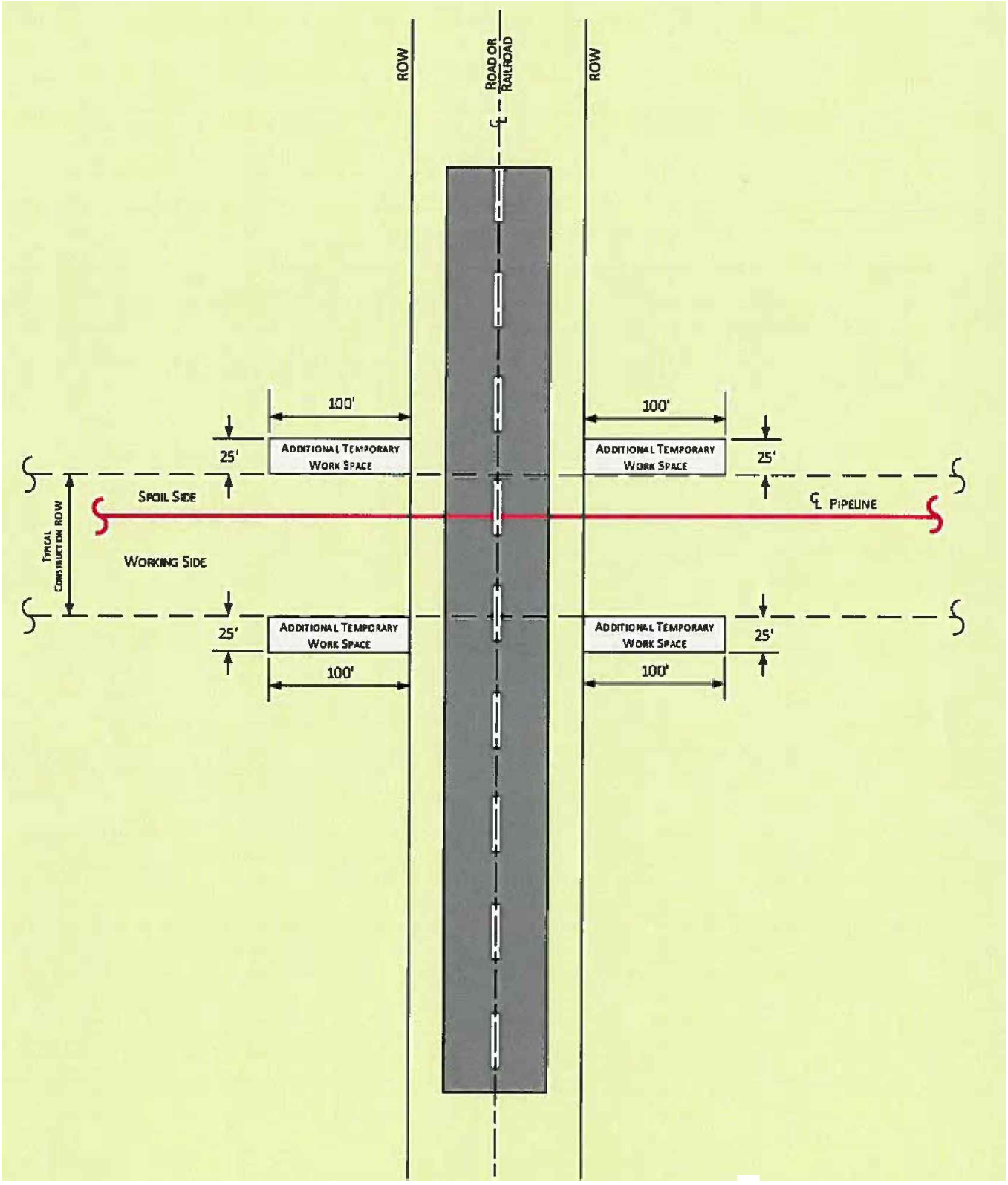
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT SINGLE-LANE ROADS AND BORED ROADS ACP AP-1 AP-2 AP-3 AP-4 AP-5

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13I-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
0 1in



CLIENT
DOMINION

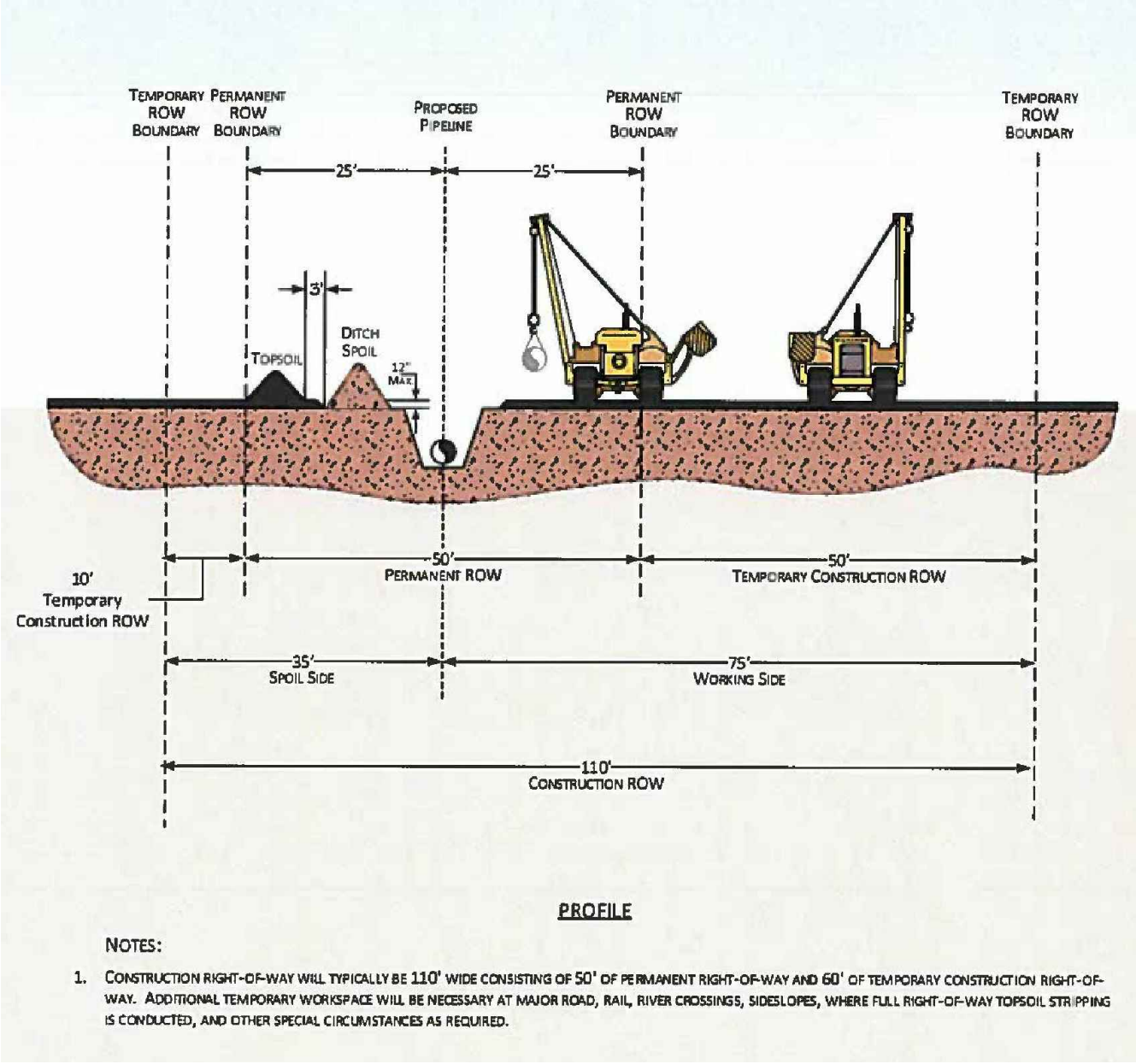
PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP ADDITIONAL WORKSPACE AT ALL BORED ROADS SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13I-3



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 110' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 60' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

CLIENT
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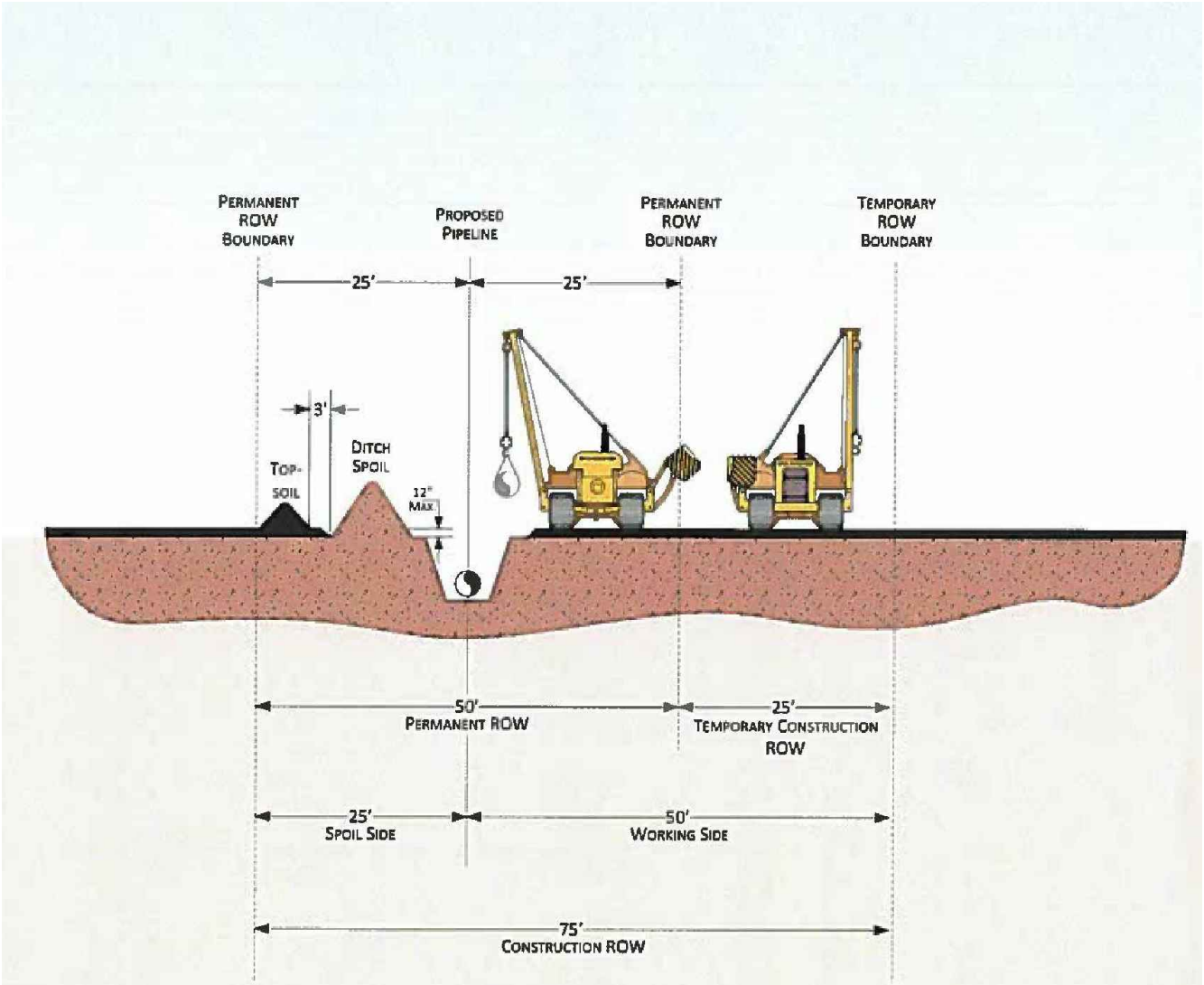
CONSULTANT
Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN NON-AG AREAS ACP AP-2

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13J-1



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 25' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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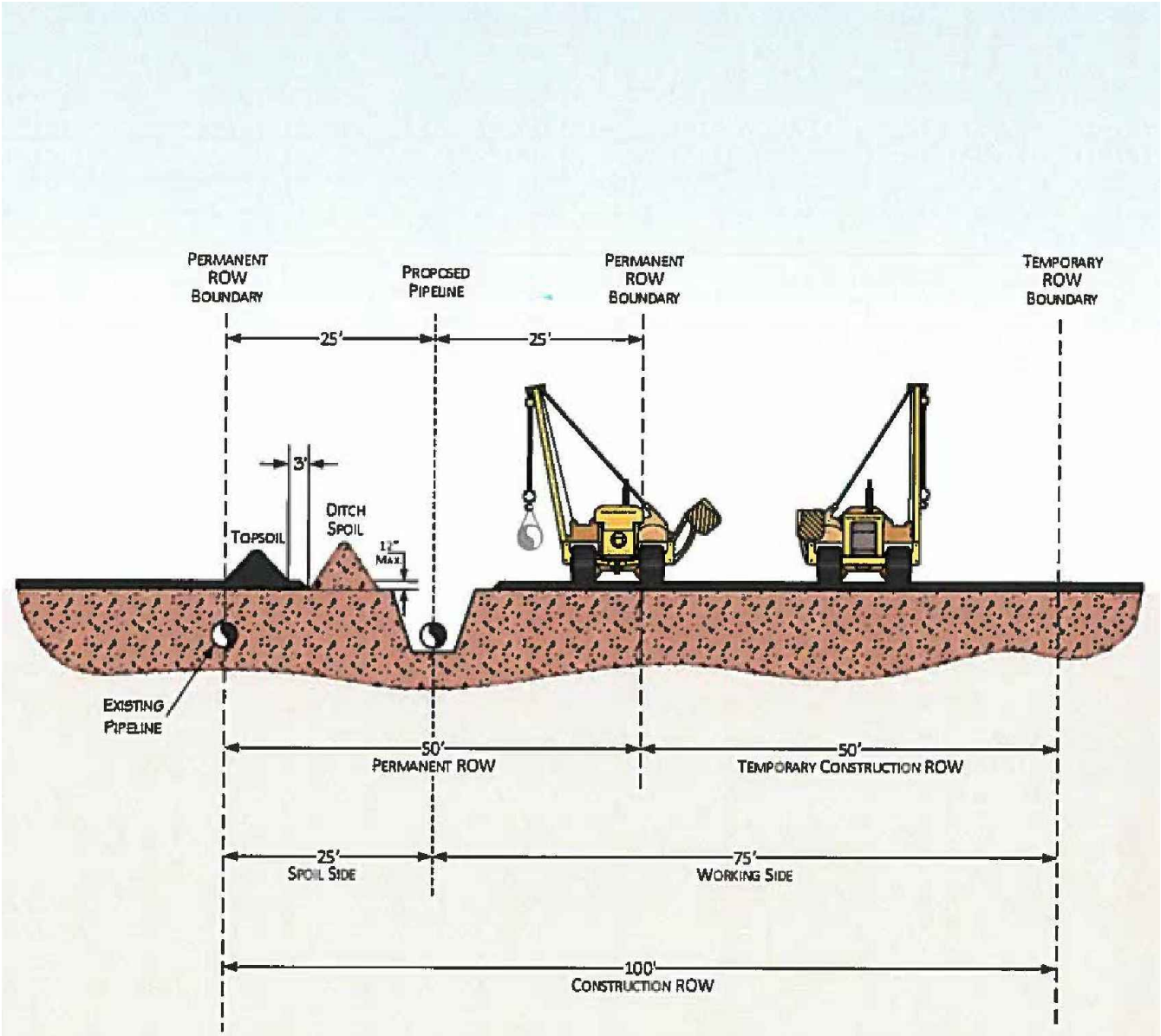
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN NON-AG AREAS AND WETLANDS ACP AP-3 AP-4 AP-5

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13J-2



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 50' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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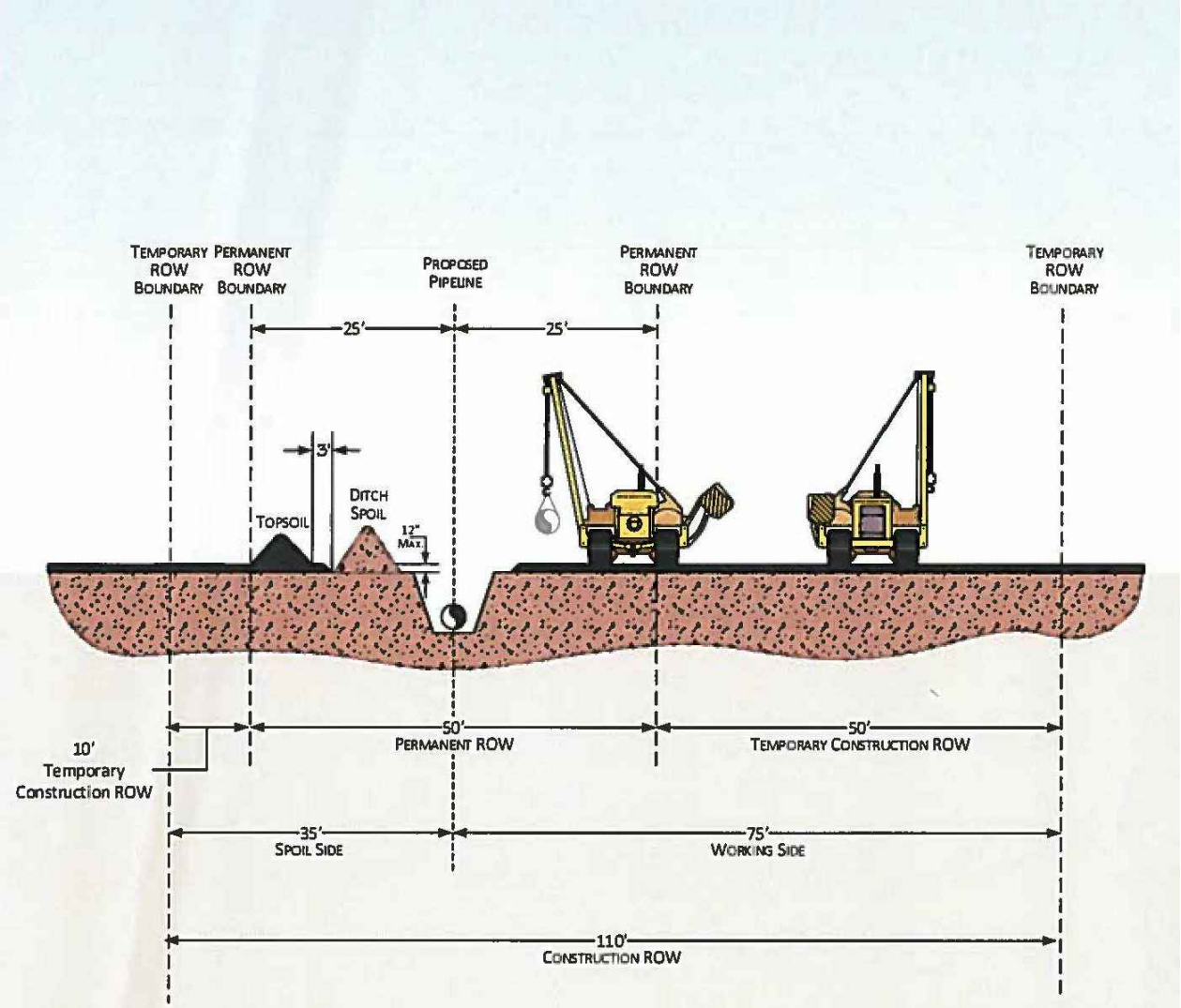
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN COLLOCATED NON-AG AREAS SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13J-3



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 110' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 60' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

CLIENT
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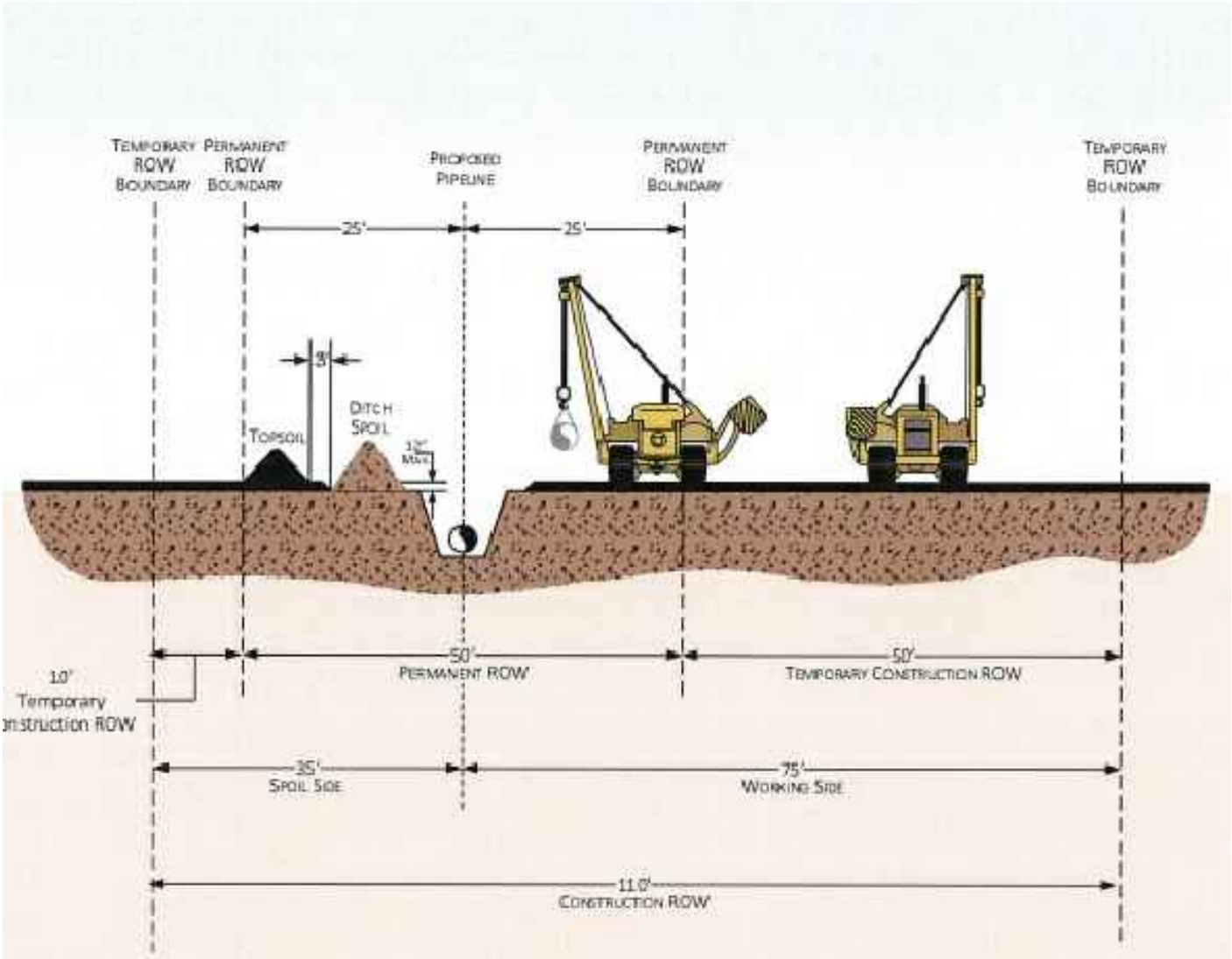
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW NOT-COLLOCATED IN NON-AG AREAS SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13J-4



PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 110' WIDE CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 60' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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BIC/INCREMENTAL CONTROLS

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN AG AREAS ACP AP-2

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13K-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A
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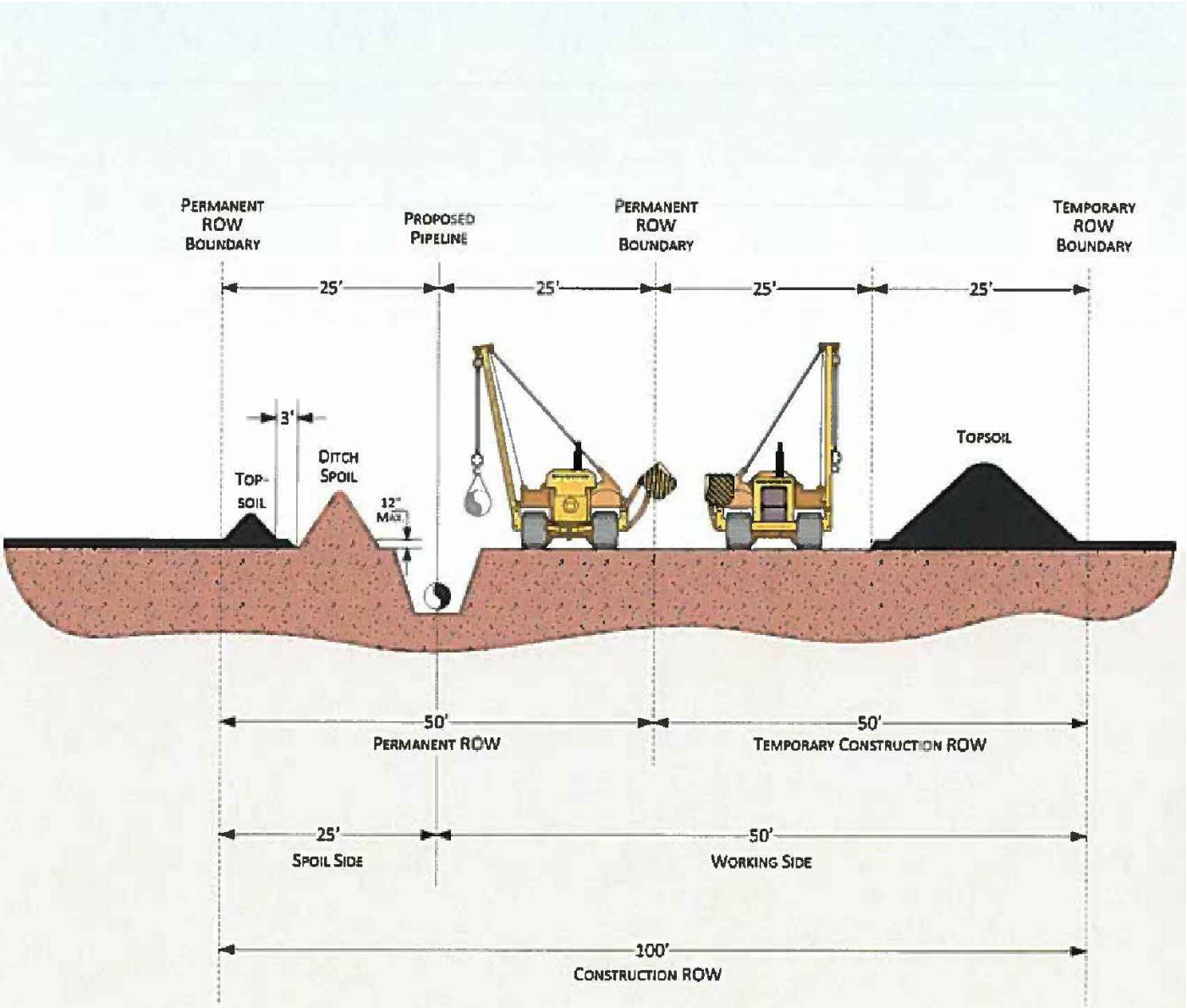

PROFILE

NOTES:

1. IN AGRICULTURAL AREAS WHERE FULL WIDTH TOPSOIL STRIPPING IS REQUIRED, AN ADDITIONAL 25' OF TEMPORARY WORKSPACE WILL BE REQUIRED. IN THIS SCENARIO, THE CONSTRUCTION RIGHT-OF-WAY WILL BE 100' WIDE, CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 50' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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PROJECT
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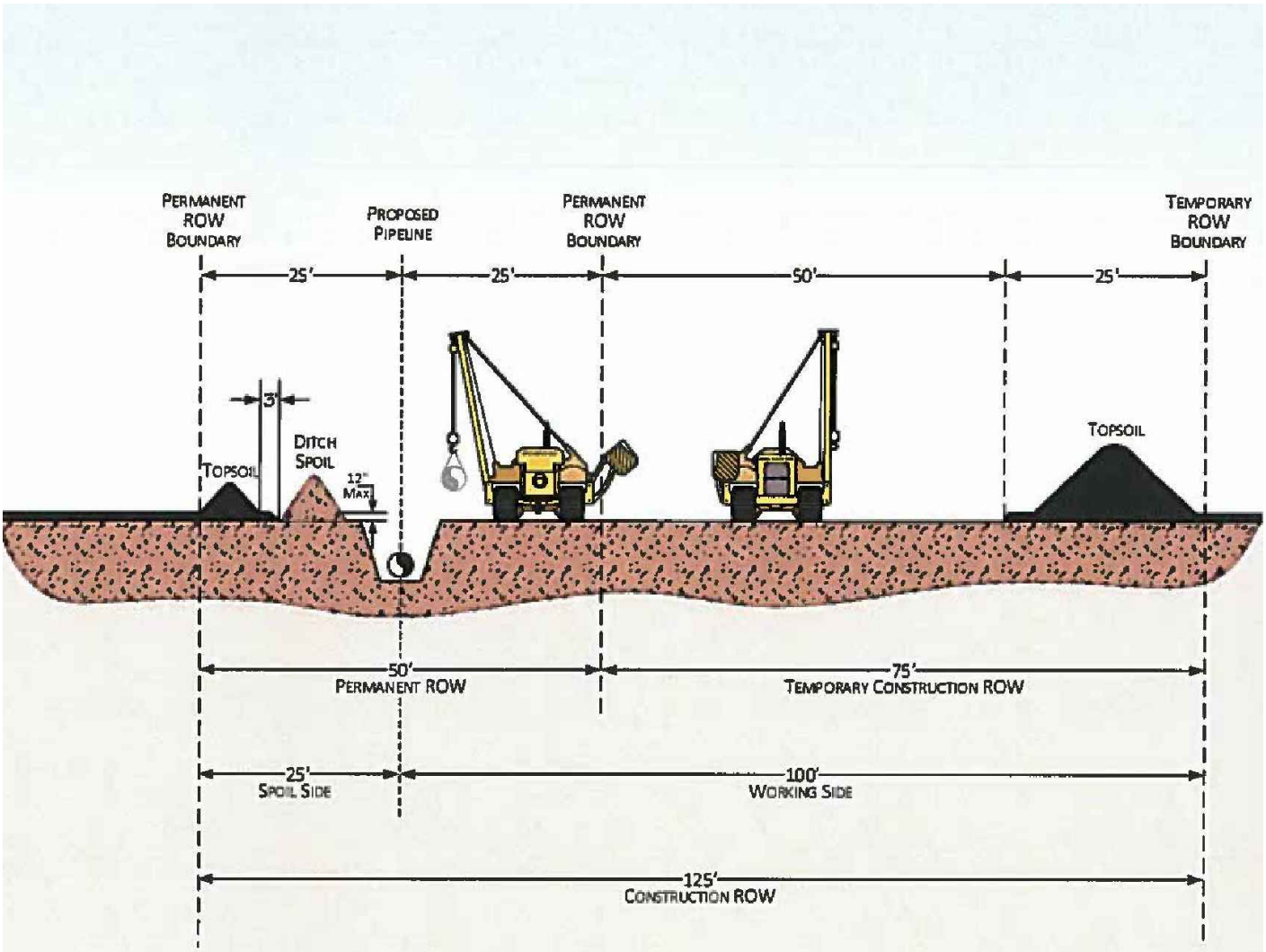
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW IN AG AREAS ACP AP-3 AP-4 AP-5

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13K-2



PROFILE

NOTES:

1. IN AGRICULTURAL AREAS WHERE FULL WIDTH TOPSOIL STRIPPING IS REQUIRED, AN ADDITIONAL 25' OF TEMPORARY WORKSPACE WILL BE REQUIRED. IN THIS SCENARIO, THE CONSTRUCTION RIGHT-OF-WAY WILL BE 125' WIDE, CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 75' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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DOMINION

PROJECT
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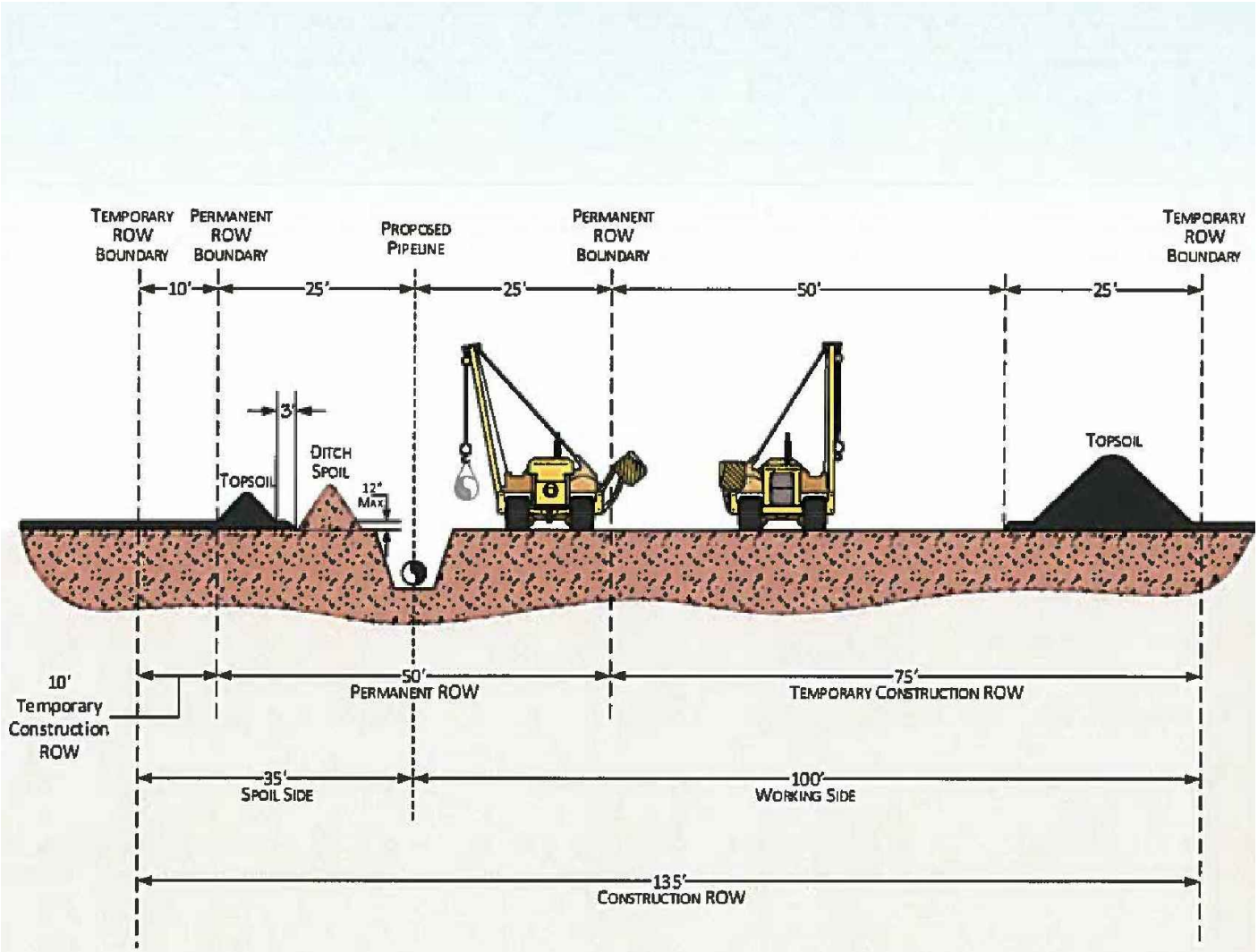
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW COLLOCATED IN AG AREAS SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13K-3



PROFILE

NOTES:

1. IN AGRICULTURAL AREAS WHERE FULL WIDTH TOPSOIL STRIPPING IS REQUIRED, AN ADDITIONAL 25' OF TEMPORARY WORKSPACE WILL BE REQUIRED. IN THIS SCENARIO, THE CONSTRUCTION RIGHT-OF-WAY WILL BE 135' WIDE, CONSISTING OF 50' OF PERMANENT RIGHT-OF-WAY AND 85' OF TEMPORARY CONSTRUCTION RIGHT-OF-WAY. ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, AND OTHER SPECIAL CIRCUMSTANCES AS REQUIRED.

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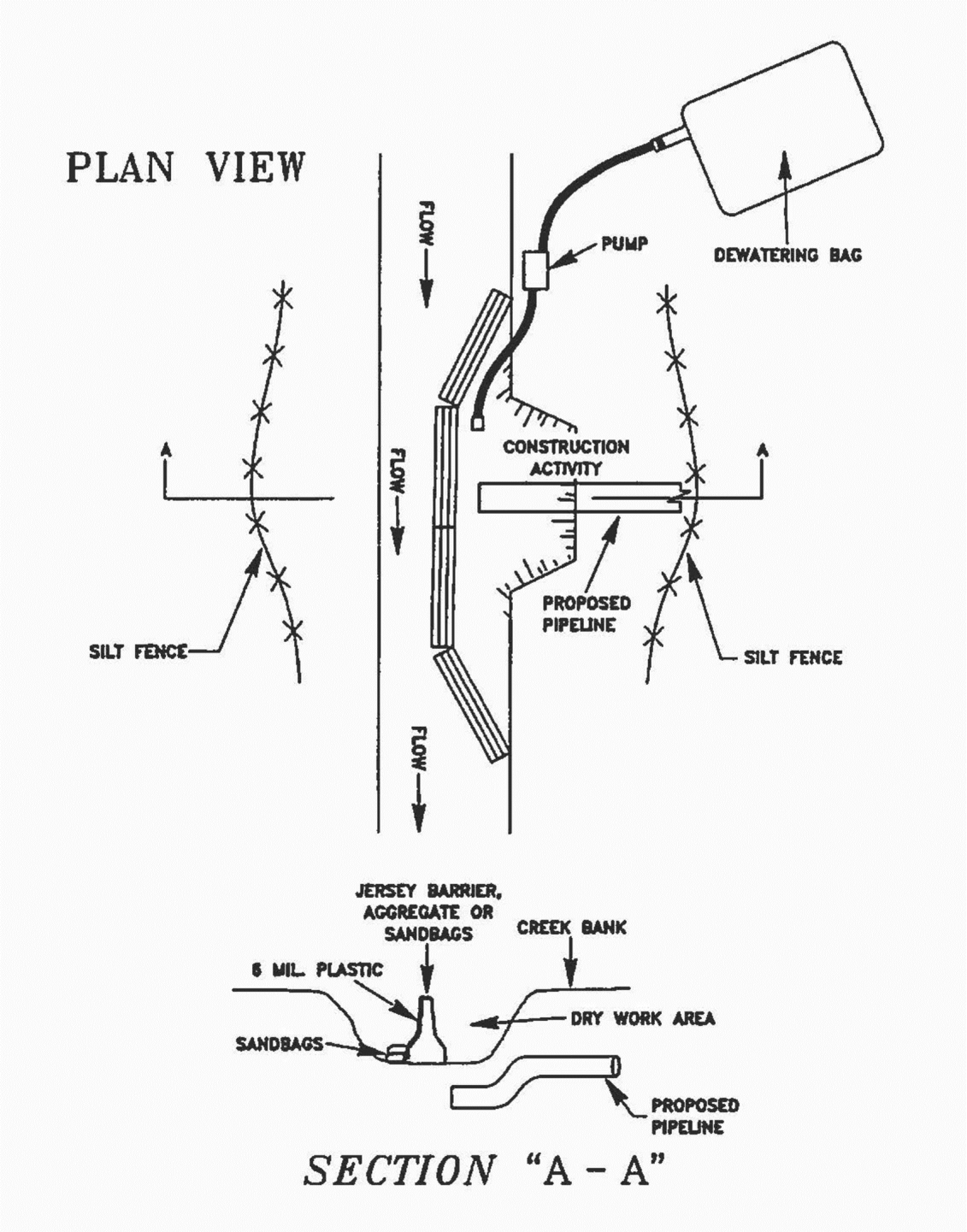
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP CONSTRUCTION ROW NOT-COLLOCATED IN AG AREAS SHP TL-635 TL-636

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13K-4



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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
TYP COFFERDAM CROSSING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	13L

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. INCLUDES, BUT IS NOT LIMITED TO, SITE SPECIFIC INVESTIGATIONS, ASSESSMENTS, ANALYSIS, DETAILED ENGINEERING, AND DESIGN WORK DEVELOPED TO MITIGATE FOR SPECIALIZED SITE GEOTECHNICAL, HYDROTECHNICAL, OR GEOLOGIC CONDITIONS THAT MAY BE IMPOSED ON THE PIPELINE.

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PROJECT
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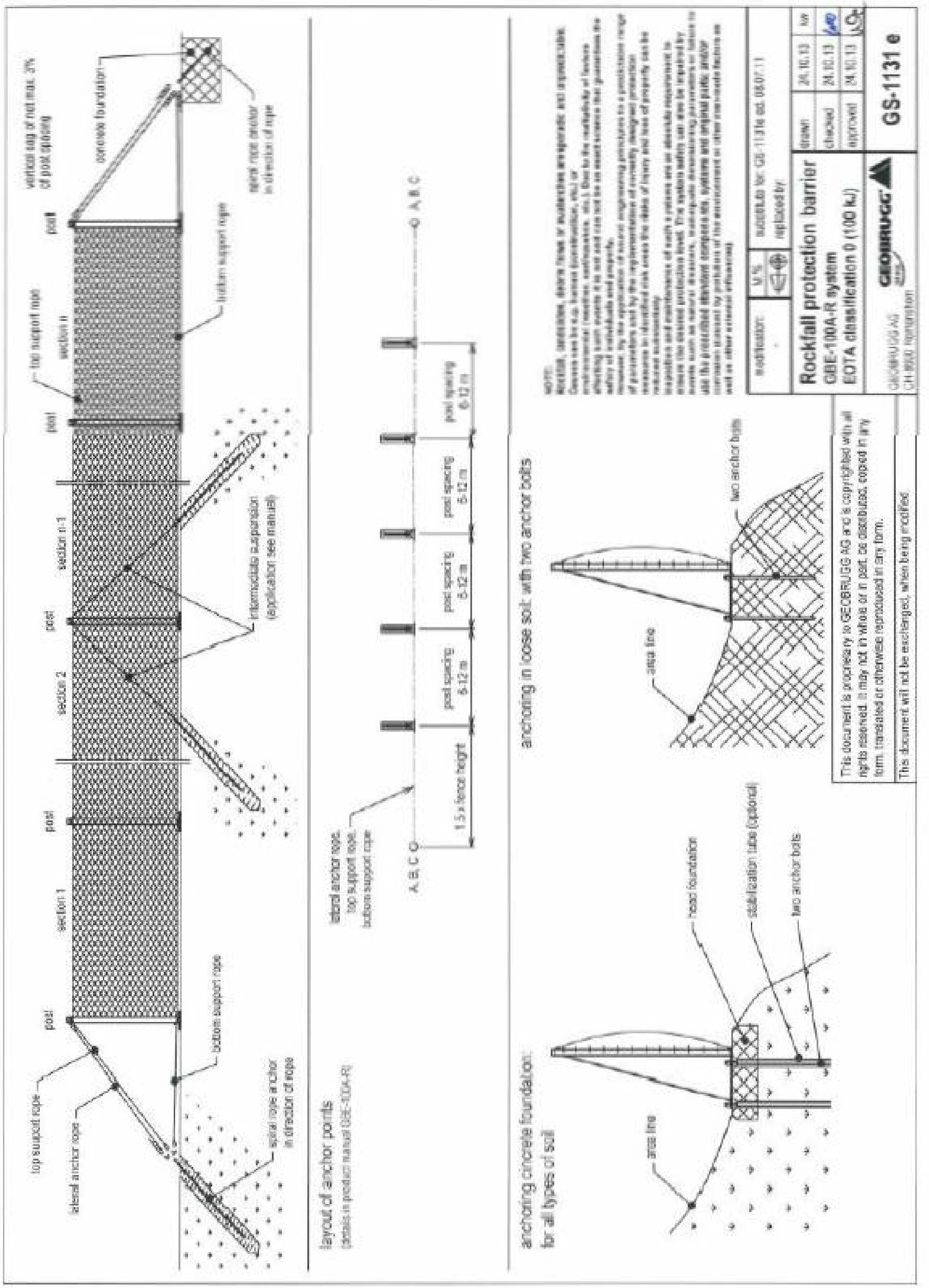
YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
SITE SPECIFIC DETAILED ENGINEERING

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	14A



NOTE(S)

1. FINAL CONFIGURATION OF ROCK FALL PROTECTION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

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DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
MESH FENCE - ROCK FALL PROTECTION

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	14B

NOTE(S)

1. FINAL PLANNING, DESIGN, AND IMPLEMENTATION OF BLASTING ACTIVITIES TO BE DETERMINED BASED ON SITE SPECIFIC CONDITIONS, AND MUST FOLLOW SPECIFICATIONS AND REQUIREMENTS AS DIRECTED BY DOMINION.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
BLASTING PLANS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	14C

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI A

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NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. ADJUST ROUTING, ALIGNMENT, LOCATION (VERTICALLY OR HORIZONTALLY), OR POSITION WITHIN THE ROW OF THE PIPELINE TO AVOID IDENTIFIED HAZARDS. EXAMPLES MAY INCLUDE, BUT ARE NOT LIMITED TO, NEW ROW LOCATIONS THAT DEPART ENTIRELY FROM THE CURRENT ALIGNMENT BY SIGNIFICANT DISTANCES, RELATIVELY SMALLER ALIGNMENT SHIFTS THAT OFFSET FOR SHORTER DISTANCES FROM THE CURRENT ALIGNMENT, MINOR ADJUSTMENTS TO THE ALIGNMENT THAT REMAIN WITHIN THE ROW BOUNDARIES, LOWERING THE PIPELINE BELOW IDENTIFIED HAZARDS WHILE STAYING WITHIN THE ROW, ETC. CHANGING ROW ALIGNMENTS REQUIRES SITE SPECIFIC PLANNING, PERMITTING, ASSESSMENTS, LAND AND PROPERTY REVIEW AND COORDINATION, ENGINEERING DESIGN TO FIT THE NEW SITE CONDITIONS, AND OTHER TECHNICAL SUPPORT EFFORTS.

CLIENT
DOMINION

PROJECT
BIC/INCREMENTAL CONTROLS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
AVOIDANCE

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	15A

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NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. SITE INVESTIGATIONS NEEDED TO CONFIRM LATERAL AND VERTICAL EXTENT OF IDENTIFIED LANDSLIDE OR OTHER UNSTABLE SLOPE CONDITIONS.

3. INVESTIGATION MAY INCLUDE PROBES, TEST PITS, EXCAVATIONS ALONG PIPELINE TRENCH, GEOPHYSICAL METHODS (I.E. NON-INTRUSIVE GPR, SEISMIC OR ELECTRICAL METHODS), OR MAY REQUIRE DEEPER SUBSURFACE DRILLING METHODS. FINAL INVESTIGATION METHONGS(S) TO BE DETERMINED BASED ON SITE CONDITIONS AND REQUIREMENTS OF SITE WORK.

4. EXCAVATIONS TO REMOVE IDENTIFIED LANDSLIDE OR OTHER UNSTABLE SLOPE CONDITIONS SHOULD BE COMPLETED FOR THE FULL EXTENT OF CHARACTERIZED HAZARD AREA, AT A MINIMUM MATCHING OR EXCEEDING THE UNDERLYING AND/OR LATERAL BOUNDING FAILURE SURFACE AND/OR SLIP PLANE. THE GOAL AND INTENT OF THIS MITIGATION APPROACH IS TO ESSENTIALLY REMOVE THE SLOPE HAZARD FROM THE SITE BY DIGGING OUT THE LIMITS OF THE IDENTIFIED HAZARD.

5. REMOVAL OF TARGETED LANDSLIDE AND/OR UNSTABLE SLOPE MATERIALS MAY REQUIRE SPECIAL CONSIDERATIONS FOR OTHER DIRECTLY OR INDIRECTLY RELATED OR CONNECTED SITE MITIGATION MEASURES AND/OR SITE ACTIVITIES TO ADDRESS SAFETY, SLOPE STABILITY, ACCESS, CONSTRUCTION FEASIBILITY, ETC, THEREFORE, PLANNING FOR IMPLEMENTATION OF THIS OPTION SHOULD INCLUDE A COMPREHENSIVE REVIEW OF EXISTING PROPOSED WORK AT THE SITE.

6. EXCAVATED MATERIALS SHOULD BE SPOILED IN LOCATION(S) THAT DO NOT ACCELERATE OR EXACERBATE THE TARGETED LANDSLIDE OR UNSTABLE SLOPE AREA, OR IMPACT OTHER NEIGHBORING LANDSLIDES OR UNSTABLE SLOPE AREAS.

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
EXCAVATION REMOVAL OF HAZARD

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	15B

NOTE(S)

1. ACCESS FOR PIPELINE ROW'S IN RUGGED AND REMOTE TERRAIN MAY BE LIMITED TO THE CONSTRUCTED ROW. IN THESE SCENARIOS, CONSTRUCTING INDEPENDENT ACCESS POINTS AND ROADS IS TYPICALLY MINIMIZED TO THEREBY ALSO MINIMIZE DISTURBANCE. AS SUCH, THE PRIMARY ACCESS IS COMMONLY ALONG THE TEMPORARY CONSTRUCTED ROW FOLLOWING THE PIPELINE ALIGNMENT, AND IS THEN NO LONGER AVAILABLE AFTER THE ROW IS RESTORED. THIS BIC MITIGATION MEASURE IS INTENDED TO IDENTIFY AREAS WHERE ACCESS MAY BE NEEDED TO SUPPORT MONITORING, OPERATION, AND MAINTENANCE OF THE ROW; AND TO COMPLETE THE PLANNING, PERMITTING, DESIGN, AND CONSTRUCTION FOR ACCESS TO THESE LOCATIONS. ADDITIONAL PLANNING, PERMITTING, LAND COORDINATION, ENVIRONMENTAL, AND TECHNICAL EFFORTS ARE REQUIRED TO SUPPORT THIS MITIGATION MEASURE, NOT SPECIFICALLY OUTLINED AND ADDRESSED HEREIN, BUT ANTICIPATED TO BE NEEDED TO IMPLEMENT THIS MITIGATION MEASURE.

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YYYY-MM-DD	2017-02-28
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DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
ACCESS TO REMOTE ROW LOCATIONS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	15C

NOTE(S)

1. FINAL CONFIGURATION OF ROW RESTORATION MEASURES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED AT TIME OF CONSTRUCTION, AND MAY CHANGE OR VARY AND/OR INCORPORATE ADDITIONAL TYPICAL DETAILS TO MITIGATE TARGETED CONDITIONS.

2. SITE SPECIFIC STUDIES FOR POTENTIAL KARST HAZARDS WILL BE COMPLETED TO IDENTIFY, CHARACTERIZE, AND DEVELOP MITIGATION RECOMMENDATIONS, AS NEEDED.

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YYYY-MM-DD	2017-02-28
PREPARED	REDMOND
DESIGN	DBC
REVIEW	-
APPROVED	AQK

TITLE
KARST HAZARDS

PROJECT No.	PHASE	Rev.	FIGURE
1535050	500	F	16A

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Site-Specific Designs