NWP WOODARD CREEK TEMPORARY EROSION PROTECTION DESIGN STEVENSON, WASHINGTON JULY, 2007

RAWING NO.	SHEET TITLE
1000	COVER
1010	PLAN AND PROFILE
1020	SITE PLAN VIEW
1030	TYPICAL PIPELINE CROSSING SECTION
1040	DETAILS
1050	SPECIFICATIONS

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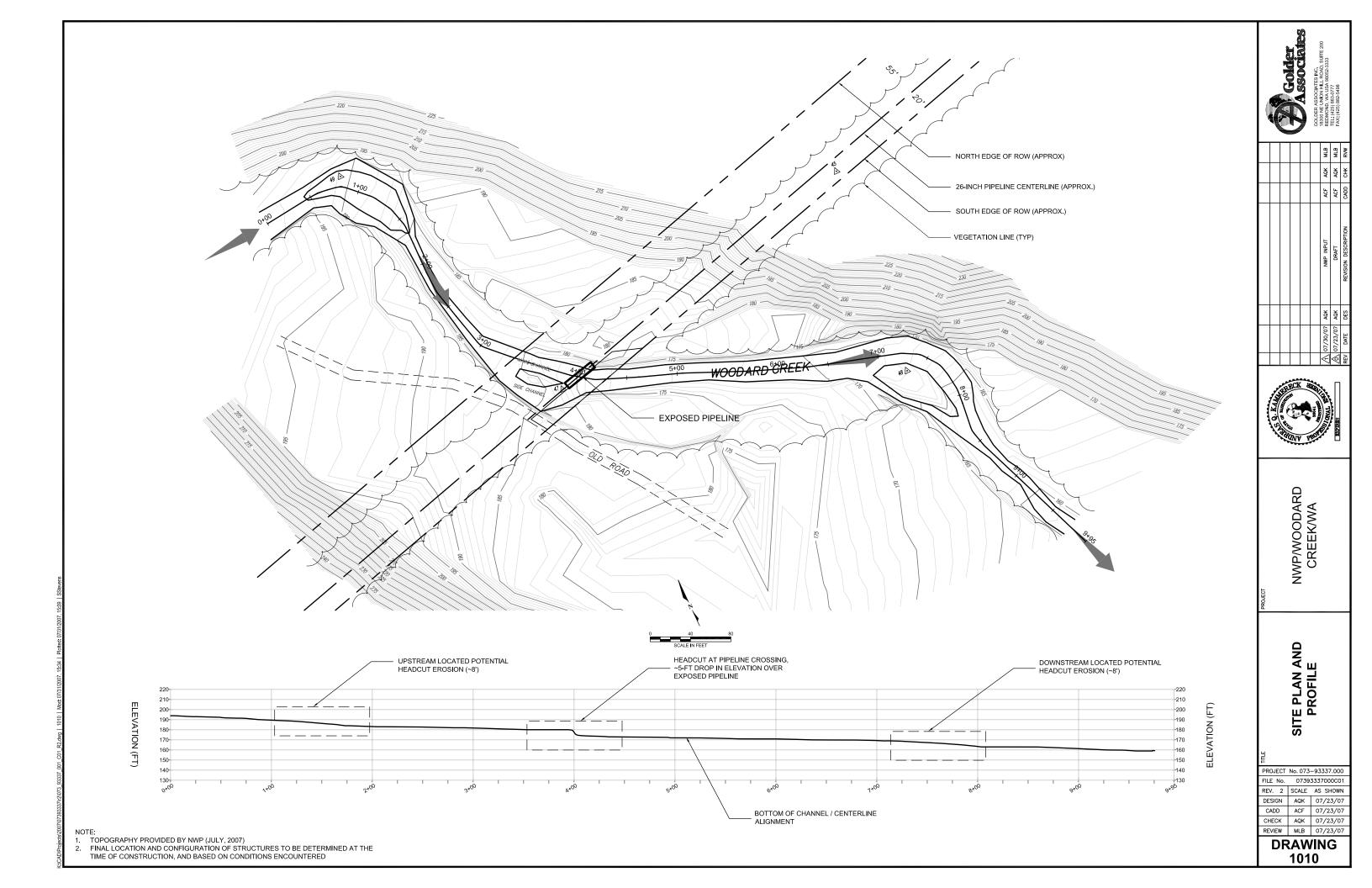


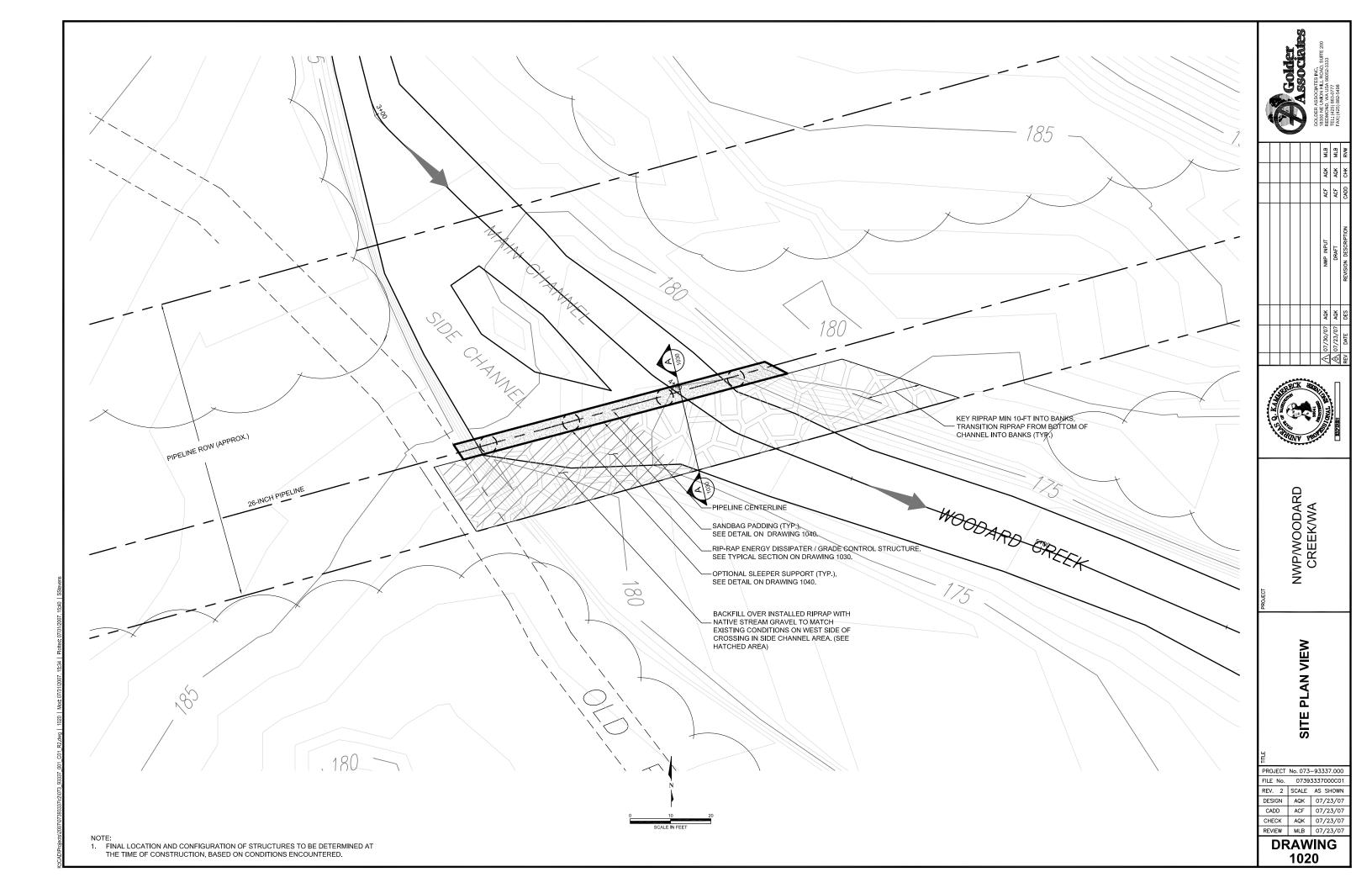
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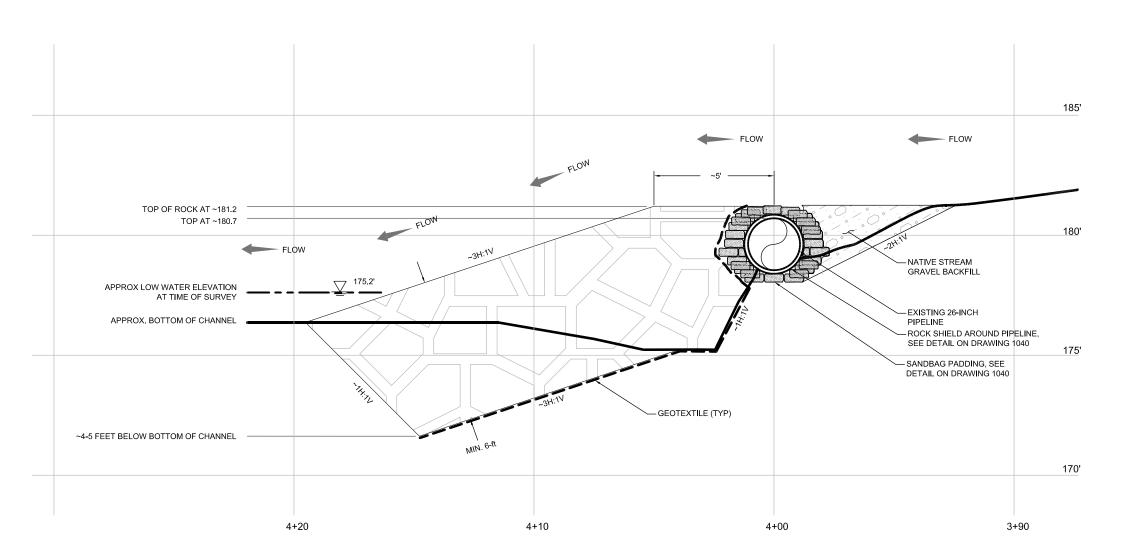
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FILE No.	07393337000C01					
REV. 2	SCALE	AS SHOWN				
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TYPICAL PIPELINE CROSSING SECTION 1020 SCALE IN FEET

CHANNEL ELEVATION AS PIPELINE CROSSING BASED ON SITE SURVEY FROM 7/16/07, AND TOPO SURVEY PROVIDED BY NWP (JULY, 2007).

2. FINAL LOCATION AND CONFIGURATION OF STRUCTURES TO BE DETERMINED AT THE TIME OF CONSTRUCTION, BASED ON CONDITIONS ENCOUNTERED.

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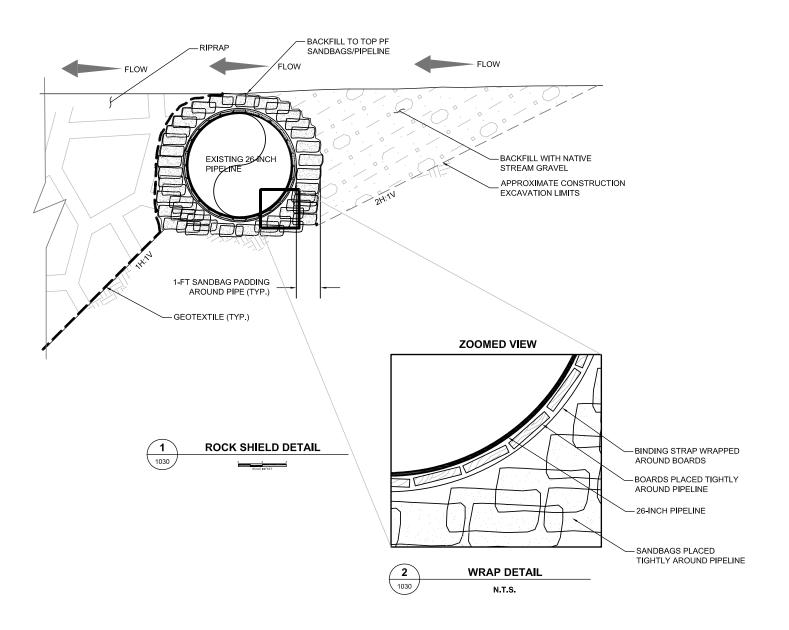


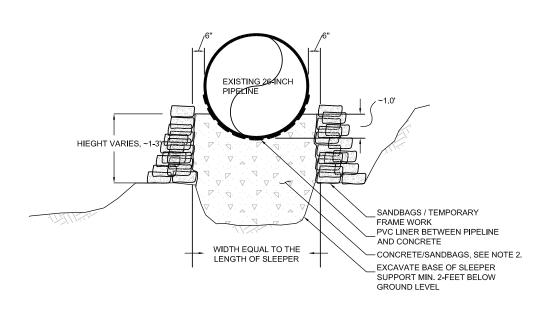
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TYPICAL PIPELINE CROSSING SECTION

PROJECT No. 073-93337.000 FILE No. 07393337000C01 REV. 2 SCALE AS SHOWN DESIGN AQK 07/23/07
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DETAILS

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PROJECT	No. 073	-93337.000
FILE No.	0739	3337000C01
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CHECK	AQK	07/23/07
REVIEW	MLB	07/23/07

DRAWING 1040

NOTES

1. FINAL LOCATION AND CONFIGURATION OF STRUCTURES TO BE DETERMINED AT THE TIME OF CONSTRUCTION, BASED ON CONDITIONS ENCOUNTERED.

2. THE CONCRETE SLEEPER SUPPORT WILL BE CONSTRUCTED WHILE THE STREAM IS DIVERTED AROUND THE CONSTRUCTION AREA. IF SITE CONDITIONS DO NOT ALLOW FOR THE USE OF CONCRETE MATERIALS, OR AS DIRECTED BY NWP, THEN SANDBAGS WILL BE USED INSTEAD OF CONCRETE MATERIALS. SLEEPER SUPPORTS USING SANDBAG MATERIALS WILL BE CONSTRUCTED TO THE SAME DIMENSIONS AS SHOWN IN THE DETAIL.

1.0 PROJECT SPECIFICATIONS

1.1 General

- A. Refer to the attached design drawings titled: "NWP, Woodard Creek, Temporary Erosion Protection Design, July, 2007" for the corresponding lines, grades, elevations, and configurations of the design.
- B. For the purpose of these specifications, the term "engineer" shall mean a representative of Williams-Northwest Pipeline Company (NWP) or their designee for this project.
- C. Final lines, grades, elevations, and configuration of the design may be modified by the engineer based on conditions encountered during construction or to address other un-foreseen changes in the site conditions.

1.2 Construction Survey

- A. The contractor will provide construction survey during implementation of the work in order to accurately determine the lines, grades, and elevations shown in the design drawings.
- B. The engineer may request at any time the confirmation of lines, grades, and/or elevations of work-in-progress for the designs shown in the drawings.
- C. The contractor will provide as-built surveys that accurately represent the completed work on a base drawing matching the elevation datum and coordinate system of the design drawings.

1.3 Materials List

The following types of materials are addressed in the following sections of these specifications. Additional material specifications are included that may not be explicity called out in the attached design sheets, but may be required to address un-forseen situations and may be used as directed by the engineer:

- A. Rock Riprap: Consists of angular rock riprap material for construction of in-channel energy dissipater and grade-control structure(s), to the lines, grades, elevations, and configuration as shown in the design drawings, or as directed by the Engineer.
- B. Filter Fabric: Consists of a geotextile material placed limit the transport of fine grained bedding soils through the riprap or stream gravel material, thereby minimizing the potential for piping failures, placed to the lines, grades, elevations, and configuration as shown in the design drawings, or as directed by the Engineer.
- C. Stream Gravel Backfill: Consists of native stream gravel materials placed in the proposed channel. It is likely that this gravel material will come from the site. Gravel material shall be placed as shown in the design drawings, or as directed by the Engineer.
- D. Pipeline Rock Shield: Consists of the installation of a protective cover wrap around the pipeline(s) to the lines, grades, elevations, and configuration as shown in the design drawings, or as directed by the Engineer.
- E. Concrete for Sleepers. Consists of the installation of support structures under the pipeline, called "sleepers", to address potentail sagging of the pipeline from erosion under the pipe, to the lines, grades, elevations, and configuration as shown in the design drawings, or as directed by the Engineer.
- F. Liner. Consists of the installation of a liner between concrete materials and the pipeline for sleeper supports, to the lines, grades, elevations, and configuration as shown in the design drawings, or as directed by the Engineer.

2.0 MATERIAL SPECIFICATIONS

The following specifications correspond to the attached design sheets.

2.1 Rock Riprap Materials

All rock riprap materials shall meet the following specifications:

- A. The contractor shall supply all materials, equipment, and labor necessary to complete the installation of riprap materials as described in these specifications and shown in the design drawings.
- B. Riprap material shall be placed to the lines, grade, elevation, and configuration as shown in the attached design drawings, or as directed by the engineer.
- C. Rock used for riprap material shall be hard, durable, angular in shape, and resistant to weathering and to water action, free of overburden, spoil, shale, and organic material.
- Rounded rock or boulders will no be accepted unless authorized by special provisions, or as directed by the engineer.
- E. Shale and rock with seams are not acceptable

- F. The minimum unit weight of the rock shall be 165 lb/CF as computed by multiplying the specific gravity (bulk-saturated-surface-dry basis, AASHTO Test T 85) of the stone times 62.4 lb/CF.
- G. Riprap armoring material shall meet the gradation requirements outlined below:

3-foot-minus Dimensions

Size (Inche
36
18
9

- Riprap rock size shall be determined by calculating the average of the height, length, and width as measured in three perpendicular directions on an individual rock
- The breath and the thickness of individual stones used as riprap material shall be no less than one-third its length
- J. The acceptability of the stone will be determined by service records (past performance on previous projects) and/or suitable tests. If tests are required, then suitable samples of the stone shall be taken in the presence of the engineer at least 30 working days in advance of the time when the placing of the rock material is expected to begin. The rock shall have a percentage of wear of not more than 50 percent at 500 revolutions as determined by AASHTO T 96.
- K. The source (i.e. the quarry) from which the rock will be obtained shall be selected at least 30 working days in advance of the when the rock will be required for the work, or as directed by the engineer.
- L. The approval of rock material from a particular location/layer within the quarry will not be construed as the approval of all rock material taken from the quarry.
- M. Each load of riprap shall be reasonably well-graded from the smallest to the maximum size specified. Rocks smaller than the specified 10 percent size and spalls will not be permitted in an amount exceeding 10 percent by weight of each load delivered to the site.
- N. Control of gradation shall be by visual inspection. The contractor shall provide two samples of rock at least one truck load (approximately 10-12 cubic yards) meeting the specified gradation. One sample will be kept at the construction site and may be a part of the finished riprap placed material. The other sample shall be provided at the quarry. These samples shall be used as a frequent reference for judging the gradation of the riprap supplied.
- O. Any difference of opinion between the engineer and the contractor on riprap slze/gradation shall be resolved by dumping and checking the gradation of a minimum of two random truck loads of riprap.
- Mechanical equipment, a sorting site, and labor needed to assist in checking the gradation shall be provided by the contractor as a part of the overall project cost.
- Q. Areas where riprap will be placed shall be free of brush, trees, stumps, organics, or other objectionable materials and be dressed to a smooth surface. All soft, spongy, saturated materials shall be removed to the depth shown on the plans or as directed by the engineer and replaced with approved native material.
- R. Riprap shall be placed to its full course thickness in one operation and in such a manner as to avoid displacing the underlying materials.
- S. Riprap will be placed in a manner which will produce a well-graded mass of riprap with the minimum practicable percentage of voids. The preferred approach for this is by placement of riprap material with an excavator that has a bucket and an opposable thumb suitable for handling the specified rock sizes.
- T. Placing of riprap in layers, by dumping from trucks, or by dumping in chutes, or by similar methods likely to cause segregation of the riprap sizes will not be permitted.
- U. All riprap material shall be placed and distributed so that there will be no large accumulations of either larger or smaller sizes of riprap.
- V. The contractor shall be responsible for complying with all applicable regulations/permit authorizations relating to stockpiling and hauling of riprap materials.
- W. Substitutions for specified materials shall be approved by the engineer prior to installation.

2.2 Filter Fabric Materials

- A. The contractor shall supply all materials, equipment, and labor necessary to complete the installation of filter fabric materials as described in these specifications and shown in the design drawings.
- B. Filter fabic shall be placed as shown in the design drawings, or as directed by the engineer.

- C. Geotextlle filter fabric material shall be a non-woven geotextile composed of polypropylene fibers which as formed into a stable network such that fibers retain their position. The geotextile shall be UV resistant. The minimum weight of the geotextile shall be minimum 10 oz/square yard. The recommended material is Mirafi 1100N (http://www.tcmirafi.com), or equivalent material.
- Substitutions for specified materials shall be approved by the engineer prior to installation.

2.3 Stream Gravel Backfill

- A. The contractor shall supply all materials, equipment, and labor necessary to complete the installation of stream gravel backfill materials as described in these specifications and shown in the design drawings.
- B. Stream gravel backfill generally consists of the material used for backfilling around the exposed pipeline on the upstream side, and in areas around the installed riprap, or other general grading as shown in the attached design sheets or as directed by the engineer.
- C. Stream gravel backfill shall be installed to the lines, grades, and configurations as shown in the design drawings, or as directed by the engineer.
- D. Stream gravel fill materials are expected to be used from on-site available materials.
- E. All gravel material used in the project shall be approved by the Engineer.

2.4 Pipeline Rock Shield

- A. The contractor shall supply all materials, equipment, and labor necessary to complete the installation of rock shield for the pipeline, as described in these specifications and shown in the design drawings.
- B. The material source for proposed boards to be placed around the pipeline shall be as directed by NWP or the Engineer. Suggested materials include cedar boards, pressure treated timber boards, synthetic boards (i.e. deck materials such as Trex or equivalent), high density poly ethelene (HDPE) boards, or HDPE pipe sections.
- C. Straps shall be used to secure the rock shield material to the pipeline. The strap material and methods for installation shall be reviewed and approved by NWP prior to installation.
- Boards shall be banded or strapped around the pipeline as directed by NWP or the Engineer.
- Substitutions for specified materials shall be approved by the engineer prior to installation.

2.5 Concrete for Sleeper Supports

- A. The contractor shall supply all materials, equipment, and labor necessary to complete the installation of sleeper supports, as described in these specifications and shown in the design drawings.
- B. Sleepers supports shall be installed at locations as directed and approved by NWP.
- Concrete placement shall be completed as near as possible to its final location.
 Methods and manner of placeing concrete shall avoid segregation of aggregates.
- Placement of concrete shall be completed within one hour after the introduction of mixing water to cement aggregates.
- E. Concrete cast in place shall be compacted with a mechanical vibrator operated withing the mass of concrete. Vibrators shall be capable of transmitting vibration to concrete at frequencies to consilidate the concrete adequately.
- F. Concrete shall attain a compressive strngth of at least 4000 pounds per square inch at 28 days. Ready-mix concrete shall comply with ASTM C94, "Specifications for Ready-Mix Concrete".
- G. Excavated trench walls and/or sand-bag walls can be used as formwork for the sleeper support structures.
- H. Substitutions for specified materials shall be approved by the engineer prior to installation.

2.6 Liner

- A. The contractor shall supply all materials, equipment, and labor necessary to complete the installation of a liner between installed concrete and the pipeline, as described in these specifications and shown in the design drawings.
- B. The material and methods for installation of liners between concrete and the pipeline for sleeper supports shall be as directed by NWP or the Engineer. Suggested materials include PVC type liner materials.
- C. The liner materials and installation methods shall be reviewed and approved by NWP prior to installation.
- Substitutions for specified materials shall be approved by the engineer prior to installation.



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SPECIFICATIONS

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	FILE	No.	0739	3337000C01
	REV.	2	SCALE	AS SHOWN
	DESIGN CADD CHECK REVIEW		AQK	07/23/07
			ACF	07/23/07
			AQK	07/23/07
			MLB	07/23/07

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