Upper Mokelumne River Watershed Authority

Supplemental Agenda Materials (2 Parts)

- January 24, 2020 -

Table of Contents – Part A

Agenda Item #	Agenda Item Title	Document Names (Approx. # of pages)
5	Solicitation of Bids for the Culvert Upgrades and Drainage Improvement Project	Bear Special Project Specifications and Table of Contents (57 pages) Bear River Sub-watershed Drawings at 95% (47 pages/maps)

Table of Contents – Part B

5	Solicitation of Bids for the Culvert Upgrades and Drainage Improvement Project	Panther Special Project Specifications and Table of Contents (56 pages) Panther Creek Sub-watershed Drawings at 95% (31 pages/maps) Standard Specifications for Construction of Roads and Bridges on Federal Highways (762 pages)

STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS -2014

DATE: 01/04/2020

Table of Contents

Preface

Preface_wo_12_20_2017

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-14 for construction of National Forest System Roads.

101 - Terms, Format, and Definitions

101.00_nat_us_07_25_2005

101.01 Meaning of Terms.

Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.01_nat_us_01_22_2009

Delete all references to the FAR (Federal Acquisition Regulations) in the specifications.

101.03_nat_us_06_16_2006

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	National Institute of Standards and Technology
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

.

Add the following to (b) SI Symbols:

mp	Milepost
ppm	Part Per Million

101.04_nat_us_02_22_2005

101.04 Definitions.

Delete the following definitions and substitute the following:

Bid Schedule--The Schedule of Items.

Bridge--No definition.

Contractor--The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the "Purchaser".

Culvert--No definition.

Right-of-Way--A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:

Adjustment in Contract Price--"Equitable adjustment," as used in the Federal Acquisition Regulations, or "construction cost adjustment," as used in the Timber Sale Contract, as applicable.

Change--"Change" means "change order" as used in the Federal Acquisition Regulations, or "design change" as used in the Timber Sale Contract.

Design Quantity-- "Design quantity" is a Forest Service method of measurement from the FS-96 *Forest Service Specifications for the Construction of Roads and Bridges.* Under these FP specifications this term is replaced by the term "Contract Quantities".

Forest Service--The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Neat Line--A line defining the proposed or specified limits of an excavation or structure.

Pioneer Road--Temporary construction access built along the route of the project.

Purchaser--The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

Protected Streamcourse--A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

Schedule of Items--A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.

Utilization Standards--The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

101.04_na

t_us_11_06_2007

101.04 Definitions.

Delete the following definitions:

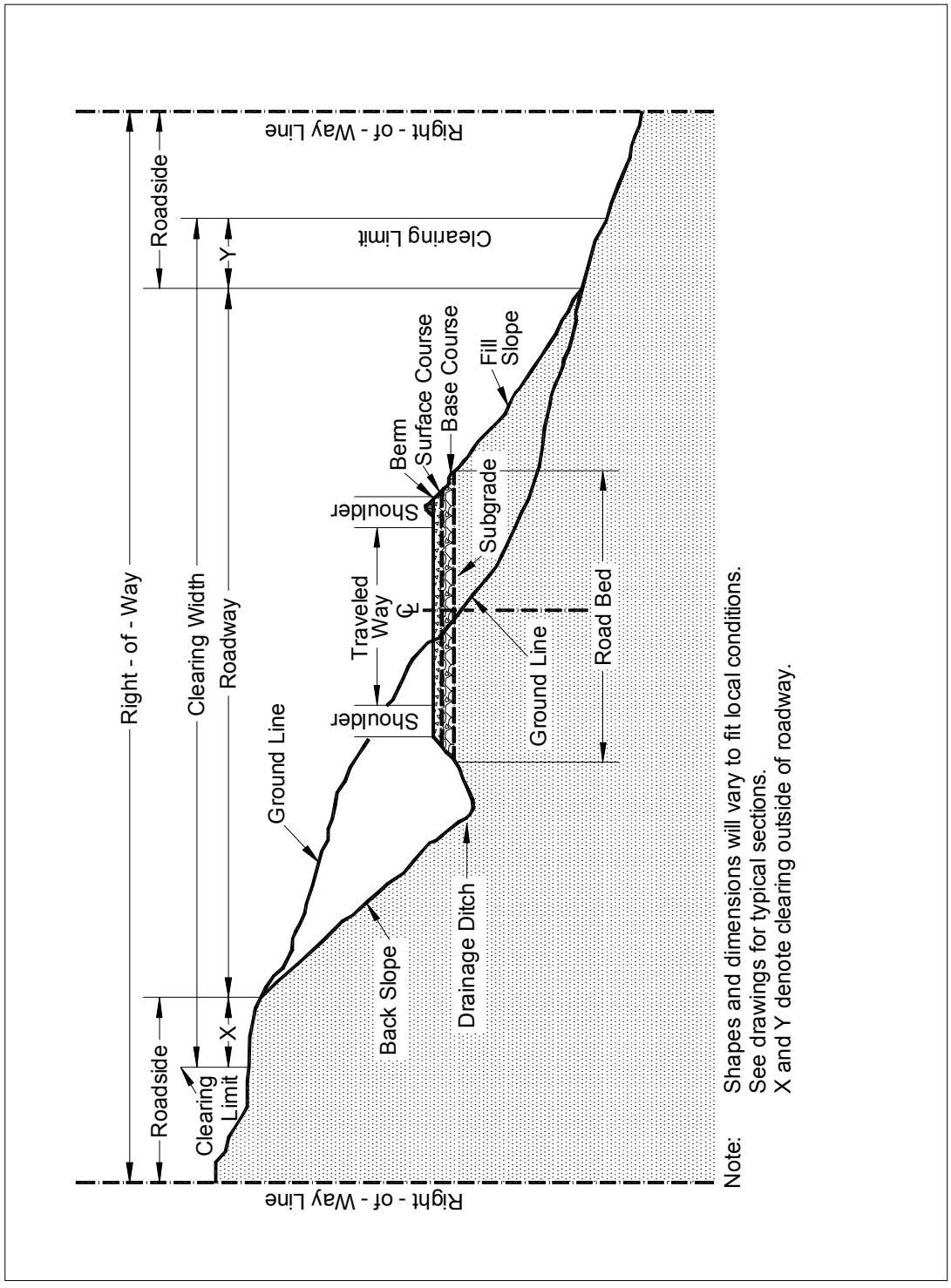
Contract Modification

Day

Notice to Proceed

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



102 - Bid, Award, and Execution of Contract

102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

103 - Scope of Work

Deletions

Delete all but subsection 103.01 Intent of Contract.

104 - Control of Work

104.00_nat_us_02_17_2005

Deletions

Delete sections 104.01, 104.02, 104.03 and 104.04.

104.06_nat_us_02_17_2005

Add the following subsection:

104.06 Use of Roads by Contractor

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or National Forest resources, and when traffic can be accommodated safely.

105 - Control of Material

105.02_nat_us_05_11_2004

105.02 Material Sources.

105.02(a) Government Provided Sources.

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.05_nat_us_05_12_2004

105.02(b) Contractor-located sources.

Add the following:

All material (e.g., soil, gravel, sand, borrow, aggregate, etc.) transported onto National Forest System land or incorporated into the work will be weed-free. The Contracting Officer may request written documentation of methods used to determine the weed-free status of any and all materials furnished by the contractor. Contractor-provided expertise and methods to establish weed-free status must be appropriate for the weeds of concern in the local area.

When proposed source is one other than previously approved by the Forest Service, a Forest Service weed specialist may inspect proposed sources to determine weed-free status. Provide the Contracting Officer written notification of proposed material sources ___14__ days prior to use. Written approval of the specific source will be provided to the contractor. If weed species are present in the proposed source, appropriate mitigation measures may allow conditional use of the source as required by the Contracting Officer.

The following applies to this contract:

*Invasive Plant List for the Eldorado National Forest, Gravel Specs 1/18/2017***:**

All Contracts

Acroptilon repens Russian knapweed
Aegilops cylindrica Jointed goatgrass
Aegilops triuncialis barbed goatgrass
Ailanthus altissima Chinese tree of heaven
Arundo donax Arundo
Cardaria chalepensis small whitetop
Cardaria draba hoarycress
Cardaria pubescens whitetop
Carduus nutans musk thistle
Carduus pycnocephalus Italian thistle

Carthamus lanatus Woolly distaff thistle
Centaurea calcitrapa purple starthistle
Centaurea diffusa diffuse (white) knapweed
Centaurea melitensis tocalote
Centaurea pratensis meadow knapweed
Centaurea solstitialis yellow starthistle
Centaurea stoebe spotted knapweed
Centaurea sulphurea Sicilian starthistle
Chondrilla juncea rush skeleton weed
Cirsium arvense Canada thistle
Cortaderia selloana pampas grass
Cytisus scoparius Scotch broom
Dittrichia graveolens stinkwort
Elymus caput-medusae medusahead
Euphorbia esula leafy spurge
Euphorbia oblongata oblong spurge
Foeniculum vulgare Fennel
Genista monspessulana French broom
Isatis tinctoria dyer's woad
Lepidium latifolium tall whitetop
Leucanthemum vulgare Oxeye daisy
Linaria genistifolia ssp. dalmatica dalmatian toadflax
Linaria vulgaris yellow toadflax
Lythrum salicaria purple loosestrife
Nicotiana glauca Tree tobacco
Onopordum acanthium Scotch thistle
Phragmites australis common reed
Phytolacca amaericana Pokeweed
Polygonum cuspidatum Japanese knotweed
Polygonum sachalinense Sakhalin knotweed
Potentilla recta Sulfur cinquefoil
Sesbania punicea Scarlet wisteria
Sorghum halepense Johnson grass
Spartium junceum Spanish broom
Tamarix chinensis Salt Cedar
Tanacetum vulgare tansy
Tribulus terrestris puncture vine
Ulex europaeus Gorse

As Needed (high-elevation, pristine, etc; consult botanist)

Bromus tectorum cheat grass
Hypericum perforatum Klamath weed
Lathyrus latifolius perennial sweet pea
Melilotus alba white sweet clover
Melilotus officinalis yellow sweet clover
Rubus armeniacus Himalayan blackberry
Rubus lacineatus cut leaf blackberry
Salsola tragus Russian thistle/tumbleweed
Silybum marianum milk thistle
Verbascum thapsus mullein

105.05 Use of Material Found in the Work.

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

106 - Acceptance of Work

Delete Section 106 in its entirety.

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_04_27_2005

107.06 Contractor's Responsibility for Work.

Delete the following:
"except as provided in Subsection 106.07".

107.09_nat_us_05_11_2004

107.09 Legal Relationship of the Parties.

Delete the entire subsection:

107.10_nat_us_02_23_2005

107.10 Environmental Protection.

Add the following:

Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a **Hazardous Spill Plan**. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

107.10_05_us_07_27_2005

108 - Prosecution and Progress

108 Delete.

Delete Section 108 in its entirety.

109 - Measurement and Payment

109.00_nat_us_02_17_2005

109 Deletions

Delete the following entire subsections:

109.06 Pricing of Adjustments.
109.07 Eliminated Work.
109.08 Progress Payments.
109.09 Final Payment.

109.02_nat_us_02_23_2005

109.02 Measurement Terms and Definitions.

(b) Contract quantity.

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

"(b) Cubic yard" to "**(c) Cubic yard".**

109.02 Measurement Terms and Definitions.

Add the following definition:

(p) Thousand Board Feet (Mbf). 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

109.03 Weighing Procedures and Devices.

(c) Project weighing system.

Add the following:

For aggregates weighed for payment, adjust scale weights of material to deduct the daily average moisture content in excess of 2 percentage points over optimum moisture as determined by AASHTO T 99 or the designated compaction method. If moisture determination is necessary, determine the daily average moisture content in accordance with AASHTO T 255, from not less than three representative samples of aggregate taken at random intervals each day that aggregate is being weighed.

151 - Mobilization

151.01_0105_us_02_23_2005

151.01 Description

Add the following at the end of the last sentence:

"Work also includes cleaning of all equipment used at the project site. Clean all construction equipment prior to entry on the project site. Remove all dirt, plant parts and material that may carry noxious weed seeds into the area. Only construction equipment inspected by the Forest Service will be allowed to operate within the project area. Treat subsequent move-ins of equipment the same as the initial move-in. Clean truck beds and dump boxes hauling to the project site prior to entering the work area."

151.03_0116_us_03_30_2005

155 - Schedules for Construction Contracts

155.00_nat_us_05_11_2004

155 Delete.

Delete Section 155 in its entirety.

156 - Public Traffic

Add the following:

156.03(a) Temporary Closures.

Road segments may be closed as shown in Table 156-1. The maximum consecutive days of closure shall be followed by a minimum number of consecutive days open to traffic as shown. Maintain traffic control devices during closure period(s). Appropriate barricades and signs will be erected and maintained as shown in the traffic control plan or as otherwise designated.

Prior to closing roads during construction, give written notice to the Contracting Officer at least 10 days in advance.

Table 156-1

Temporary Road Closures

ROAD NUMBER	FROM TERMINUS	TO TERMINUS	MAX. CONSECUTIVE DAYS CLOSED
08N03	08N03D	END	1
08N03D	BEG	END	7
08N08	BEG	END	1
08N10	BEG	END	4 HRS
08N11	BEG	END	7
08N14	08N16	08N03	4 HRS
08N14	08N24	END	7
08N15	BEG	END	7
08N16	08N14	08N16A	1 HRS
08N18B	BEG	END	7
08N19	BEG	END	7
08N20C	BEG	END	7
08N20J	BEG	END	7
08N21	BEG	END	1 HRS
08N30	BEG	END	4 HRS
NSR0814	BEG	END	7

156.04 Maintaining Roadways During Work.

Add the following:

(g) Do not construct detours outside of the clearing limits or use alternate route detours without the approval of the CO.

156.08 Traffic and Safety Supervisor.

Delete this subsection in its entirety.

Measurement and Payment

156.10 . Delete this section and substitute the following:

Payment incidental to other work.

157 - Soil Erosion Control

157.01 Description.

Delete and substitute the following:

This work consists of furnishing, constructing, and maintaining temporary erosion and sediment control features at culvert replacements, stock piles of loose material and staging areas.

171 - Weed and Disease Prevention

171.00_nat_us_03_30_2005

Description

171.01 This work consists of washing and treating construction equipment to remove seeds, plants, and plant fragments from the equipment before the equipment is used on National Forest System lands.

Material

171.02 Conform to the following Subsection:

Water	725.01

Construction Requirements

171.03 General . Notify the CO in writing at least 15 days before moving any construction equipment onto National Forest System lands. Construction equipment does not include cars, pickup trucks, and other vehicles that regularly travel between the construction site and areas outside of National Forest System lands.

Perform all work at a location designated on the plans or other locations approved in writing. Provide the CO with an opportunity to monitor the washing and inspection.

171.04 Equipment. Use a high pressure washing system.

For work on National Forest System lands, use a washing system that traps all wash water and either stores it for removal from National Forest System lands or recycles the water for continued use. If the equipment recycles the water, provide adequate filters for seed removal. Dispose of the filter material and removed seeds in an approved manner. Do not mix soaps, detergents, or other chemicals with the wash water.

For work at a commercial washing facility, use an approved facility.

171.05 Washing.

Wash the sides, tops, and undercarriages of all construction equipment. Remove all seeds, plants, plant fragments, dirt, and debris from the construction equipment.

171.06 Inspection. Inspect the washed construction equipment, including the undercarriage, to ensure that the washing removed the dirt, debris, and seeds from the construction equipment. Rewash the construction equipment as necessary or as directed.

171.07 Acceptance. Weed prevention will be evaluated under Subsection 106.02.

Measurement

171.08 Do not measure weed prevention for payment.

Payment

171.09 Include all costs associated with the Section 171-Weed Prevention in the unit price for Section 151-Mobilization.

201 - Clearing and Grubbing

201.01_nat_us_02_18_2005

201.01 Description

Replace with the following

This work consists of clearing and grubbing required to complete site work. Work also includes slash disposal as specified in the Drawings.

See Drawings for additional information.

201.06_Eldorado 07_2011

201.06 Disposal.

Delete and substitute the following:

Add the following disposal methods:

(a) Chip, Grind or Masticate. Use an approved chipping machine to grind slash and stumps greater than 1 inches in diameter and longer than 2 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer. Remove and dispose of all stobs, greater than 1/2-inch, from roadway.

Equipment used to masticate roadway prism shall be rubber tired or street pads.

(b) Decking. Limb and deck logs. Cut logs to lengths less than 30 feet. Ensure that logs stacks are stable and free of brush and soil. Remove brush from decks.

(c) Scatter. Scatter construction slash, such as stumps, limbs and tops within project on fill slopes and cut slopes. Remove all slash from ditch lines culvert inlets and outlets. All slash, stumps and chips shall be placed in a stable position on the slopes.

All disposal sites containing loose dirt shall have temporary erosion control measures in place which completely contains loose dirt. Temporary erosion control shall be considered incidental to other work.

202 - Additional Clearing and Grubbing

202.04_1005_us_05_16_2005

202.01 Description

Delete this section and substitute the following:

This work consists of the removal of individual trees and stumps where designated in the Drawings.

202.03 General

Delete last sentence and substitute the following:

Dispose of clearing and grubbing debris according to Subsection 201.06 - Disposal.

202.09 Measurement

Second paragraph substitute '8 inches' for '6 inches'..

203 - Removal of Structures and Obstructions

203.05_nat_us_02_18_2005

203.05 Disposing of Material.

Delete disposal options and substitute the following:

(a)Remove from project. Haul cut asphalt, metal pipes and other construction trash, to public landfills, recycler, or other state approved disposal sites.

(b)Haul to designated disposal site. Haul woody debris, excess loose dirt and rock, to designated disposal site Shown in the Drawings.

204 - Excavation and Embankment

204.00_nat_us_02_26_2007

Replace Section 204 in its entirety with the following:

Description

204.01 This work consists of excavating material and constructing embankments. This includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing earthen and rocky material.

Work also includes the construction of ditches, catch basins. inlet basins, waterbars, graded dips and swales.

204.02 Definitions.

(a) Excavation. Excavation consists of the following:

(1) Roadway excavation. All material excavated from within the right-of-way or easement areas, except sub excavation covered in (2) below and structure excavation covered in Sections 208 and 209. Roadway excavation includes all material encountered regardless of its nature or characteristics.

(2) Sub excavation. Material excavated from below sub grade elevation in cut sections or from below the original ground line in embankment sections. Sub excavation does not include the work required by Subsections 204.05, 204.06(b), and 204.06(c).

(3) Borrow excavation. Material used for embankment construction that is obtained from outside the roadway prism. Borrow excavation includes unclassified borrow, select borrow, and select topping.

(4) Road surface enhancements. Work includes excavation necessary to complete drainage features used to control surface water on and adjacent to roadways.

(b) Embankment construction. Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:

(1) Preparing foundation for embankment;
(2) Constructing roadway embankments;
(3) Benching for side-hill embankments;
(4) Constructing dikes, ramps, mounds, and berms; and
(5) Backfilling sub excavated areas, holes, pits, and other depressions.

(c) Conserved topsoil. Excavated material conserved from the roadway excavation and embankment foundation areas that is suitable for growth of grass, cover crops, or native vegetation.

(d) Waste. Excess and unsuitable roadway excavation and sub excavation that cannot be used.

Material

204.03 Conform to the following Subsections:

Backfill material	704.03
Select borrow	704.07
Select topping	704.08
Topping	704.05
Unclassified borrow	704.06
Water	725.01

Construction Requirements

204.04 Preparation for Roadway Excavation and Embankment Construction. Clear the area of vegetation and obstructions according to Sections 201 and 203.

204.05 Reserved.

204.06 Roadway Excavation. Excavate as follows:

(a) General. Do not disturb material and vegetation outside the construction limits. Disturbed areas outside limits may require seeding and mulching at no cost to Government.

Incorporate only suitable material into embankments. Replace any shortage of suitable material caused by premature disposal of roadway excavation. Dispose of unsuitable or excess excavation material according to Subsection 204.14.

At the end of each day's operations, shape to drain and compact the work area to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

Retrieve material deposited outside of the clearing limits as directed by the CO. Place unsuitable material in designated areas.

(b) Rock cuts. Blast rock according to Section 205. Excavate rock cuts to 6 inches below sub grade within the roadbed limits. Backfill to sub grade with topping or with other suitable material. Compact the material according to Subsection 204.11 When blasting rock, use blasting methods according to Subsection 205.08.

(c) Earth cuts. Scarify earth cuts to 6 inches below sub grade within the roadbed limits. Compact the scarified material according to Subsection 204.11.

(d) Pioneer Roads. Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated into the roadway unless specified in the slash treatment method. Maintain drainage during pioneering operations.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.

204.07 Sub excavation. Excavate material to the limits designated by the CO. Take cross-sections according to Section 152. Prevent unsuitable material from becoming mixed with the backfill. Dispose of unsuitable material according to Subsection 204.14. Backfill the sub excavation with topping, or other suitable material. Compact the material according to Subsection 204.11.

204.08 Borrow Excavation. Use all suitable roadway excavation in embankment construction. Do not use borrow excavation when it results in excess roadway excavation. Deduct excess borrow excavation from the appropriate borrow excavation quantity.

Obtain borrow source acceptance according to Subsection 105.02. Develop and restore borrow sources according to Subsection 105.03. Do not excavate beyond the established limits. When applicable, shape the borrow source to permit accurate measurements when excavation is complete.

204.09 Preparing Foundation for Embankment Construction. Prepare foundation for embankment construction as follows:

(a) Embankment less than 4 feet high over natural ground. When designated, remove topsoil and break up the ground surface to a minimum depth of 6 inches by plowing or scarifying. Compact the ground surface according to Subsection 204.11.

(b) Embankments over an existing asphalt, concrete, or gravel road surface. Scarify gravel roads to a minimum depth of 6 inches. Scarify or pulverize asphalt and concrete roads to 6 inches below the pavement. Reduce all particles to a maximum size of 6 inches and produce a uniform material. Compact the surface according to Subsection 204.11.

(c) Embankment across ground not capable of supporting equipment. Dump successive loads of embankment material in a uniformly distributed layer to construct the lower portion of the embankment. Limit the layer thickness to the minimum depth necessary to support the equipment.

(d) Embankment on an existing slope steeper than 1V:3H. Cut horizontal benches in the existing slope to a sufficient width to accommodate placement and compaction operations and equipment. Bench the slope as the embankment is placed and compacted in layers. Begin each bench at the intersection of the original ground and the vertical cut of the previous bench.

204.10 Embankment Construction. Incorporate only suitable roadway excavation material into the embankment. When the supply of suitable roadway excavation is exhausted, furnish unclassified borrow to complete the embankment. Obtain written approval before beginning construction of embankments over 6 feet high at sub grade centerline. Construct embankments as follows:

(a) General. At the end of each day's operations, shape to drain and compact the embankment surface to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.

Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes as construction of the embankment progresses.

Where placing embankment on one side of abutments, wing walls, piers, or culvert headwalls, compact the material using methods that prevent excessive pressure against the structure.

Where placing embankment material on both sides of a concrete wall or box structure, conduct operations so compacted embankment material is at the same elevation on both sides of the structure.

Where structural pilings are placed in embankment locations, limit the maximum particle size to 4 inches.

(b) Embankment within the roadway prism. Place embankment material in horizontal layers not exceeding 12 inches in compacted thickness. Incorporate oversize boulders or rock fragments into the 12-inch layers by reducing them in size or placing them individually as required by (c) below. Compact each layer according to Subsection 204.11 before placing the next layer.

Material composed predominately of boulders or rock fragments too large for 12-inch layers may be placed in layers up to 24 inches thick. Incorporate oversize boulders or rock fragments into the 24-inch layer by reducing them in size or placing them individually according to (c) below. Place sufficient earth and smaller rocks to fill the voids. Compact each layer according to Subsection 204.11 before placing the next layer.

(c) Individual rock fragments and boulders. Place individual rock fragments and boulders greater than 24 inches in diameter as follows:

(1) Reduce rock to less than 48 inches in the largest dimension.
(2) Distribute rock within the embankment to prevent nesting.
(3) Place layers of embankment material around each rock to a depth not greater than that permitted by (b) above. Fill all the voids between rocks.
(4) Compact each layer according to Subsection 204.11 before placing the next layer.

(d) Embankment outside of roadway prism. Where placing embankment outside the staked roadway prism, place material in horizontal layers not exceeding 24 inches in compacted thickness. Compact each layer according to Subsection 204.11.

204.11 Compaction.

Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until there is no visible evidence of further consolidation.

When wheeled equipment cannot access area, use vibraplate or other compacting devices to achieve compaction. Compact until soil ceases to deform under the effort.

Top 6 inces, use a vibratory roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until there is no visible evidence of further consolidation. Finish according to Subsection 204.13.

204.12 Ditches. Slope, grade, and shape ditches. Remove all projecting roots, stumps, rock, or similar matter. Maintain all ditches in an open condition and free from leaves, sticks, and other debris.

Form furrow ditches by plowing or using other acceptable methods to produce a continuous furrow. Place all excavated material on the downhill side so the bottom of the ditch is approximately 18 inches below the crest of the loose material. Clean the ditch using a hand shovel, ditcher, or other suitable method. Shape to provide drainage without overflow.

204.13 Sloping, Shaping, and Finishing. Complete slopes, ditches, culverts, riprap, and other underground minor structures before placing aggregate courses. Slope, shape, and finish as follows:

(a) Sloping. Leave all earth slopes with uniform roughened surfaces, except as described in (b) below, with no noticeable break as viewed from the road. Except in solid rock, round tops and bottoms of all slopes including the slopes of drainage ditches. Round material overlaying solid rock to the extent practical. Scale all rock slopes. Slope rounding is not required on tolerance class D though M roads.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material, and repair or restore all damage to the work. Bench or key the slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

(b) Stepped slopes. Where required by the contract, construct steps on slopes of 1⅓V:1H to 1V:2H. Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

(c) Shaping. Shape the sub grade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

(d) Finishing. Finish the roadbed to be smooth and uniform, and shaped to conform to the typical sections. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 204-2. Ensure that the subgrade is visibly moist during shaping and dressing. Scarify to 6 inches below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material. Maintain proper ditch drainage.

For surfaced roads, remove all material larger than 6 inches from the top 6 inches of the roadbed.

204.14 Disposal of Unsuitable or Excess Material. Dispose of unsuitable or excess material at designated sites or legally off of the project.

When there is a pay item for waste, shape and compact the waste material in its final location. Do not mix clearing or other material not subject to payment with the waste material.

204.15 Acceptance.

Material for embankment and conserved topsoil will be evaluated under Subsections 106.02 and 106.04.

Excavation and embankment construction will be evaluated under Subsections 106.02 and 106.04.

Clearing and removal of obstructions will be evaluated under Sections 201 and 203.

Measurement

204.16 Measure the Section 204 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

(a) Roadway excavation. Measure roadway excavation in its original position as follows:

(1) Include the following volumes in roadway excavation:

(a) Roadway prism excavation;
(b) Rock material excavated and removed from below subgrade in cut sections;
(c) Unsuitable material below sub grade and unsuitable material beneath embankment areas when a pay item for sub excavation is not shown in the bid schedule;
(d) Ditches, except furrow ditches measured under a separate bid item;
(e) Topsoil;
(f) Borrow material used in the work when a pay item for borrow is not shown in the bid schedule;
(g) Loose scattered rocks removed and placed as required within the roadway;
(h) Conserved material taken from stockpiles and used in Section 204 work; and
(i) Slide and slip out material not attributable to the Contractor's method of operation.

(2) Do not include the following in roadway excavation:

(a) Overburden and other spoil material from borrow sources;
(b) Over breakage from the back slope in rock excavation;
(c) Water or other liquid material;
(d) Material used for purposes other than required;
(e) Roadbed material scarified in place and not removed;
(f) Material excavated when stepping cut slopes;
(g) Material excavated when rounding cut slopes;
(h) Preparing foundations for embankment construction;
(i) Material excavated when benching for embankments;
(j) Slide or slip out material attributable to the Contractor's method of operation;
(k) Conserved material taken from stockpiles constructed at the option of the Contractor; and
(l) Material excavated outside the established slope limits.

(3) When both roadway excavation and embankment construction pay items are shown in the bid schedule, measure the following as roadway excavation only:

(a) Unsuitable material below sub grade in cuts and unsuitable material beneath embankment areas when a pay item for sub excavation is not shown in the bid schedule;
(b) Slide and slip out material not attributable to the Contractor’s method of operations; and
(c) Drainage ditches, channel changes, and diversion ditches, catch basin, inlet basins, waterbars and graded dips. Lead off ditches are considered incidental to other work.

(b) Unclassified borrow, select borrow, and select topping. When measuring by the cubic yard measure in its original position. If borrow excavation is measured by the cubic yard in place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden.
Do not measure borrow excavation used in place of excess roadway excavation.

(c) Embankment construction. Measure embankment construction in its final position. Do not make deductions from the embankment construction quantity for the volume of minor structures.

(1) Include the following volumes in embankment construction:

(a) Roadway embankments;
(b) Material used to backfill sub excavated areas, holes, pits, and other depressions;
(c) Material used to restore obliterated roadbeds to original contours; and
(d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:

(a) Preparing foundations for embankment construction;
(b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and
(c) Material used to round fill slopes.

(d) Rounding cut slopes. Measure rounding cut slopes horizontally along the centerline of the roadway if a pay item for slope rounding is included in the bid schedule. If a pay item for slope rounding is not included in the bid schedule slope rounding will be considered subsidiary to excavation.

(e) Waste. Measure waste by the cubic yard in its final position. Take initial cross-sections of the ground surface after stripping over burden. Upon completion of the waste placement, retake cross-sections before replacing overburden.

(f) Slope scaling. Measure slope scaling by the cubic yard in the hauling vehicle.

Payment

204.17 The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 204-2
Construction Tolerances

	Tolerance Class [a]												
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope[b])	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

(a) Maximum allowable deviation from construction stakes and drawings.
(b) Maximum allowable deviation from staked slope measured from slope stakes or hinge points.
(c) Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet, and no vertical curves with a curve length of less than 80 feet when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of

209.10_nat_us_03_30_2005

209.10 Backfill.

(a) General.

Add the following:

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 6 feet at sub grade centerline.
- Installation in a protected stream course.
- Round pipe with a diameter of 48 inches or greater.
- Pipe arches with a span of 50 inches or greater.
- Any box culvert of structure other than pipe culverts.

(b) Pipe culverts.

(1) Pipe culverts with compacted backfill. Add the following:

On each side of the pipe, excavate an area at least as wide as the diameter of the pipe. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material. See Drawings.

209.11_nat_us_02_24_2005

209.11 Compacting.

Delete the subsection and add the following:

Compact backfill using designated compaction method A, B, or C:

Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

Method B. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each layer using appropriate compaction equipment until visual displacement ceases.

For compaction under sections 252, 254, 255, 257, 258, compact with a vibratory steel wheeled roller with a mass of at least 8 tons.

Method C. Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers to at least 95 percent of the maximum density. Determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

301 - Untreated Aggregate Courses

301 Title Change.

Change the title to: **Section 301 Aggregate Courses**

Delete this Section in its entirety and substitute the following:

Description

301.01 This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by grid rolling, pit-run, screening, or crushing methods, or placing commercially produced aggregate meeting Caltrans specification.

Surface aggregate grading is designated as shown in Table 703-3.

Sub base and base aggregate grading is designated as shown in Table 703-2.

Screened aggregate grading is designated as shown in Table 703-16.

Material

301.02 Conform to the following Subsections:

Aggregate	703.05
Water	725.01

Construction Requirements

301.03 General. Prepare the surface on which the aggregate course is placed according to Section 204 or 303 as applicable.

Request approval of the roadbed in writing before placing aggregate.

Submit target values within the gradation ranges shown in Table 703-2 or 703-3 for the required grading. After reviewing the Contractor's proposed target values the CO will determine the final values for the gradation and notify the Contractor in writing.

For screened, pit run, or grid-rolled material, furnish material smaller than the maximum size. No gradation other than maximum size will be required for pit run and grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size.

After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at approved locations. Temporary erosion control measures shall be inplace if stock pile to remain in place longer than 14 days or when wet weather is predicted.

301.04 Mixing and Spreading. Mix the aggregate and adjust the moisture content to obtain a uniform mixture with a moisture content suitable for the specified compaction method. Spread and shape the mixture on the prepared surface in a uniform layer with no segregation of size, and to a loose depth that will provide the required compacted thickness.

Do not place the mixture in a layer exceeding 6 inches in compacted thickness or twice the maximum particle size, whichever is less. When more than one layer is necessary, compact each layer according to Subsection 301.05 before placing the next layer. Route hauling and leveling equipment uniformly over the full width.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

301.05 Compacting. Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

> **Compaction D**. Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11.

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface.

301.06 Construction Tolerance. If grade finishing stakes are required, finish the surface to within ±0.05 feet from staked line and grade elevation.

If grade finishing stakes are not required, shape the surface to the required template and check the surface with a 10-foot straightedge. Defective areas are surface deviations in excess of 1/2 inch in 10 feet between any two contacts of the straightedge with the surface.

Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

Ensure that the compacted thickness is not consistently above or below the specified thickness. The maximum variation from the compacted specified thickness is ½ inch.

Ensure that the compacted width is not consistently above the specified width. The maximum variation from the specified width will not exceed +12 inches at any point.

301.07 Maintenance. Maintain the aggregate course to the correct line, grade, and cross-section by blading, watering, rolling, or any combination thereof until placement of the next course. Correct all defects according to Subsection 302.06.

301.08 Acceptance.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.04. If the aggregate is obtained from a Government stockpile then the above characteristics will be evaluated under Subsection 106.02. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.04. Construction of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

The allowable upper and lower aggregate gradation limits are equal to the Target Value plus or minus the allowable deviations shown in Tables 703-2 and 703-3.

The allowable upper and lower Plasticity index limits for surface courses are stated in 703.05(b).

Preparation of the surface on which the aggregate course is placed will be evaluated under Section 204 or 303 as applicable.

Measurement

301.09 Measure the Section 301 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measurement shall be by the ton. Contractor shall provide Engineer proof of quantity delivered and placed by supplying weight tickets. Weight tickets are required for payment.

Payment

302.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 301 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

303 - Road Reconditioning

Delete Section 303 in its entirety and replace with the following.

303.01_0503_eldo_01_10_2007

Description

303.01 Work.

This work consists of reconditioning ditches, shoulders, roadbeds, cattle guards, culvert inlets/outlets, asphalt surfaces, approach road intersections, aggregate surfaces and surface enhancements such as dips, catch basins, inlet basins and swales. Construct out-slopes, clean and maintain all roadbed drainage structures when Shown on the Drawings. Work also includes the repair of minor slumps and slides, berm removal and curve widening when it only involves using the existing travel way and shoulders. See Drawings for additional information.

Construction Requirements

303.02 Culvert Maintenance. Clean inlets and outlets of existing cross drains and culverts according to Subsection 607.

303.03 Ditch Reconditioning. Remove all slide material, sediment, vegetation, and other debris from the existing ditches and culvert inlets and outlets. Reshape ditches and culvert inlets and outlets to achieve positive drainage and a uniform ditch width, depth, and grade. Dispose of waste as shown on the plans or in landings.

303.04 Shoulder Reconditioning. Repair soft and unstable areas according to Subsection 204.13. Remove all slide material, vegetation, and other debris from existing shoulders including shoulders of parking areas, turnouts, berms and other widened areas. Dispose of waste as shown on the plans.

303.05 Native Surface Roadbed Reconditioning Repair soft and unstable areas according to Subsection 204.13. Remove all organic, deleterious material larger than 6 inches from the top 6 inches of subgrade. Dispose of waste as shown on the plans. When Shown in the Drawings, scarify, rip and shape the traveled way and shoulders at locations and to the depth and width designated on the plans. Remove surface irregularities and shape to provide a uniform surface.

Restore existing road enhancements, such as dips, swales, catch basins, inlet basins to meet design requirements according to the Typicals. See Drawings.

Dispose of rock larger than 4 inches brought to the surface during scarification in areas designated on the plans.

Establish a blading pattern that will retain the surfacing on the roadbed and provide a through mixing of the materials within the completed surface width.

For portions of roads not requiring scarification, the roadbed may contain rocks larger than 4 inches provided they do not extend above the finished roadbed surface more than 2". Reduce in place or remove rock extending above the finished roadbed surface. Dispose of removed rock in areas designated on the plans.

Compact using the following method as specified:

(a) Compaction A. Operate equipment over the full width.

(b) Compaction B. Operate rollers over the full width of each layer until visual displacement ceases, but not fewer than five complete passes. Use rollers that meet the following requirements:

(1) Steel wheeled rollers, other than vibratory, capable of exerting a force of not less than 250 pounds per inch of width of the compression roll or rolls.

(2) Vibratory steel wheeled rollers equipped with amplitude and frequency controls with a minimum weight of 10 tons, specifically designed to compact the material on which it is used.

(3) Pneumatic-tired rollers with smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi.

303.06 Aggregate Surface Reconditioning. Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. When specified, scarify to the depth of the aggregate surface or to a depth of 6 inches, whichever is less, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Subsection 301.05.

Maintain the existing cross slope or crown unless otherwise shown on the plans.

Restore existing road enhancements, such as dips, swales, catch basins, inlet basins to meet design requirements according to the Typicals. See Drawings

303.07 Surfaced Roadway Reconditioning. Perform all the applicable work described in Subsections 303.02 through 303.04.

Sweep surface of dust, leaves and other woody material. Wash surface if additional bituminous applications are required.

Maintain the existing cross slope or crown unless otherwise shown on the plans.

Restore existing road enhancements, such as catch basins and inlet basins to meet design requirements according to the Typicals. See Drawings

303.08 Pulverizing. When specified, scarify the surface to the designated depth and width. Pulverize all material to a size one and one half times the maximum sized aggregate or to 1½ inches, whichever is greater. Mix, spread, compact, and finish the material according to Section 301.

303.09 Cattle guards. When specified, remove cattle guard decks. Clean the deck and the area beneath the cattle guard of soil and other material to the bottom of the original foundation over the entire width of the installation. Reinstall the cattle guard deck.

303.10 Acceptance. See Table 303-1 for sampling and testing requirements. Road reconditioning work will be evaluated under Subsections 106.02 and 106.04.

303.11 Measurement. Measurement will be Lump Sum and includes all equipment and labor to prepare site and finish site work according to the plans. See Drawings for specific site work requirements.

There shall be no separate measurement for ditch reconditioning, lead off ditches, culvert cleaning, inlet/outlet cleaning, minor slump or slide repair, and shoulder reconditioning. This work shall be considered incidental to Road Reconditioning unless specified otherwise in the Schedule of Items.

Delete Table 303-1 and replace with the following:

303.07_nat_us_03_02_2005

303.10_10_us_05_23_2005

Table 303-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Existing Roadway	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 (1)	1 per each mixture or change in material	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density Method E	—	R-1 Marshall	"	"	"	"
		Moisture-density Method F	—	AASHTO T 180(1)	"	"	"	"
		Moisture-density Method G	—	R-1 Marshall	"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	1 per 3000 yd^2	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

602.03_nat_us_04_14_2005

602.01 Description

Add the following:

Work also includes all the labor, equipment, and materials to complete culvert installation.

602.03 General.

Delete this section and substitute the following:

Excavate and backfill according to Section 209. Payment for all excavation and backfill associated with pipe installation shall be included in the price of the culvert.

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

602.05_1005_us_01_18_2005

Delete the second paragraph and replace with the following.

Join pipe sections together with coupling bands according to AASHTO M 36 or M 196. Limit the use of bell and spigot joints to slopes of 10% or less. Limit the use of bands with projections (dimpled) to slopes of 10% or less and when agreed to in writing by the Contracting Officer.

607.04 Cleaning Culverts in Place.

Add the following:

If approved by the CO, all or part of the pipe designated to be cleaned in-place may be removed, cleaned, and re-laid in accordance with Section 602. In these cases, furnish all material required to replace damaged pipe and joints and relay the pipe at no cost to the Government.

607.08 Measurement

Delete and substitute the following:

There will be no seperate measurement for this work.

607.09 Payment

Delete and substitute the following:

There will be no seperate payment for tack coat and shall be considered incidental to work paid for under Subsection 303.

619 - Fences, Gates, and Cattle Guards

617.02_nat_us_07_03_2007

619.01 Description

Add the following:

Work also includes the haul and placement of barrier rocks, installation of log and earthen barricades.

619.09 Acceptance

Delete this subsection and substitute the following:

619.09 Barrier rocks, log and earthen barricades

Boulders may be obtained within project area when approved by the Contracting Officer or purchased commercially. Section 105 applies to both locally acquired or commercially purchased rock.

Logs for barricades are available on site. Loads should be long enough to span the full width of the road and installed according to the Drawings. See typicals.

Locations of barrier rocks shall be staked on the ground and installed according to the Drawings. See typicals.

635.03 General.

Add the following:

Install temporary traffic control signs to temporary posts or approved temporary sign mounts.

703.05_nat_us_05_17_2005

Delete 703.05 and replace with the following:

703.05 Sub base, Base, Surface Course, and Screened Aggregate.

(a) Sub base or base aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-2
(2) Liquid limit, AASHTO T 89	25 max.
(3) Plastic limit, AASHTO T 90	No plastic
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	50% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(b) Surface course aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-3
(2) Liquid limit, AASHTO T 89	35 max.
(3) Plastic Index, AASHTO T 90	
a) If the percent passing the No. 200 sieve is less than 12%	2 to 9
b) If the percent passing the No. 200 sieve is greater than 12%	Less than 2
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	75% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Do not furnish material that contains asbestos fibers.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(c) Screened aggregate – Furnish hard, durable particles or fragments of stone, slag, or gravel conforming the following:

(1) Gradation	Table 703-16
(2) Plastic Index, AASHTO T 90	Less than 9
(3) Los Angeles abrasion, AASHTO T 96	55% max.
(4) Free from organic matter and lumps or balls of clay.	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary.

Delete Table 703-2 and replace with the following:

Table 703-2
Target Value Ranges for Subbase and Base Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)				
	Grading Designation				
	A (Subbase)	B (Subbase)	C (Base)	D (Base)	E (Base)
2½ inch	100				
2 inch	97 – 100	100	100		
1½ inch		97 – 100			
1 inch	65 – 79 (6)		80 – 100 (6)	100	
3/4 inch			64 – 94 (6)	86 – 100 (6)	100
1/2 inch	45 – 59 (7)				
3/8 inch			40 – 69 (6)	51 – 82 (6)	62 – 90 (6)
No. 4	28 – 42 (6)	40 – 60 (8)	31 – 54 (6)	36 – 64 (6)	36 – 74 (6)
No. 40	9 – 17 (4)			12 – 26 (4)	12 – 26 (4)
No. 200	4.0 – 8.0 (3)	4.0 – 12.0 (4)	4.0 –7.0 (3)	4.0 – 7.0 (3)	4.0 – 7.0 (3)

( ) The value in the parentheses is the allowable deviation (±) from the target values..

Delete Table 703-3 and replace with the following:

Table 703-3
Target Value Ranges for Surface Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)					
	Grading Designation					
	F	G	H	S	T	U
1 1/2 inch	100(			100		
1 inch	97-100	100		72 – 92 (6)	100	
3/4 inch	76-89 (6)	97 - 100	97 - 100			100
1/2 inch					71 – 91 (6)	
3/8 inch	56-68 (6)	70 – 80 (6)	80 – 92 (6)	51 – 71 (6)		71 – 90 (6)
No. 4	43-53 (7)	51 – 63 (7)	58 – 70 (7)	36 – 53 (7)	43 – 60 (7)	50 – 68 (7)
No. 8				26 – 40 (6)	30 – 46 (6)	34 – 51 (6)
No. 16	23-32 (6)	28 – 39 (6)	28 – 40 (6)			
No. 30	15-23 (5)	19 – 27 (5)	16 – 26 (5)			
No. 40				14 – 25 (5)	16 – 28 (5)	19 – 30 (5)
No. 200	10.0-16.0 (4)	10.0 – 16.0 (4)	9.0 – 14.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)

( ) The value in the parentheses is the allowable deviation (±) from the target values.
If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 8-12 (4).

Add Table 703-16:

Table 703-16

Gradation Requirements for Screened Aggregate

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)						
	Grading Designation						
	L	M	N	O	P	Q	R
6 inch	100	100					
4 inch			100	100			
3 inch					100	100	
2 inch							100
No. 4		15-45		15-45		15-45	

703.06_nat_us_03_02_2005

703.10(e) Flakiness Index.

Delete and replace with the following:

Flakiness Index, FLH T 508 30% max.

703.10(i) Adherent Coating.

Add the following:

Adherent coating on the aggregate, FLH T 512 0.5% max.

703.07_nat_us_03_02_2005

Table 703-2 Correction

Include the following substitution

In Table 703-2, delete the "436 – 74 (6)" percent by mass passing for grading E (base) No. 4 sieve size and substitute "36 – 74 (6)."

Table 703-2 Correction

Include the following substitution

In Table 703-2, delete the "436 – 74 (6)" percent by mass passing for grading E (base) No. 4 sieve size and substitute "36 – 74 (6)."

703.10_nat_us_03_02_2005

Delete Table 703-7 and substitute the following:

Table 703-7 Target Value Ranges

Table 703-7
Target Value Ranges for
Single and Multiple Course Surface Treatment Aggregate Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 & T 11)					
	Grading Designation					
	A	B	C	D	E	F
1½ inch	100(1)					
1 inch	90-100(3)	100(1)				
¾ inch	0-35(5)	90-100(3)	100(1)			
½ inch	0-8(3)	0-35(5)	90-100(3)	100(1)		
⅜ inch	—	0-12(3)	0-35(5)	85-100(3)	100(1)	100(1)
No. 4	—	—	0-12(3)	0-35(5)	85-100(3)	85-100(1)
No. 8	—	—	—	0-8(3)	0-23(4)	—
No. 200	0-1(1)	0-1(1)	0-1(1)	0-1(1)	0-1(1)	0-10(1)

(1) Statistical procedures do not apply.
( ) The value in the parentheses is the allowable deviation (±) from the target values.

705.02_ us_03_18_2008

705.02 Riprap Rock.

Delete Table 705-1 and replace it with the following:

Gradation Requirements for Riprap

Class	Percent of Rock by Mass	Mass (pounds)	Approximate Min. Dimension [b,c] (inches)
1	20	22 to 33	6 to 8
	30	11 to 22	5 to 6
	40	1.1 to 11	2 to 5
	10[a]	0 to 1.1	0 to 2
2	20	55 to 110	8 to 10
	30	22 to 55	6 to 8
	40	2.2 to 22	3 to 6
	10[a]	0 to 2.2	0 to 3
3	20	220 to 330	14 to 16
	30	110 to 220	10 to 14
	40	11 to 110	5 to10
	10[a]	0 to11	0 to 5
4	20	550 to 770	18 to 20
	30	220 to 570	14 to 18
	40	22 to 220	6 to 14
	10[a]	0 to 22	0 to 6
4a	20	770 to1353	20 to 24
	30	330 to 770	16 to 20
	40	33 to 330	7 to16
	10[a]	0 to 33	0 to 7
5	20	1540 to 2200	26 to 28
	30	770 to 1540	20 to 26
	40	55 to 1100	8 to 20
	10[a]	0 to 55	0 to 8
6	20	1870 to 3520	28 to 34
	30	1100 to 1870	22 to 28
	40	110 to 1100	10 to 22
	10[a]	0 to 110	0 to 10
7	20	4400 to 5940	35 to 39
	30	2200 to 4400	28 to 35
	40	220 to 2200	14 to 28
	10[a]	0 to 220	0 to 14
8	20	7000 to 10000	42 to 47
	30	4000 to 7000	35 to 42
	40	400 to 4000	16 to 35
	10[a]	0 to 400	0 to 16

a) Furnish spall and rock fragments graded to provide a stable dense mass.

b) The volume of a rock with these cubic dimensions has a mass approximately equal to the specified rock mass.

c) Furnish rock with breadth and thickness at least one-third its length.

713 - Roadside Improvement Material

713.05_nat_us_03_02_2005

713.05 Mulch.

Add the following:

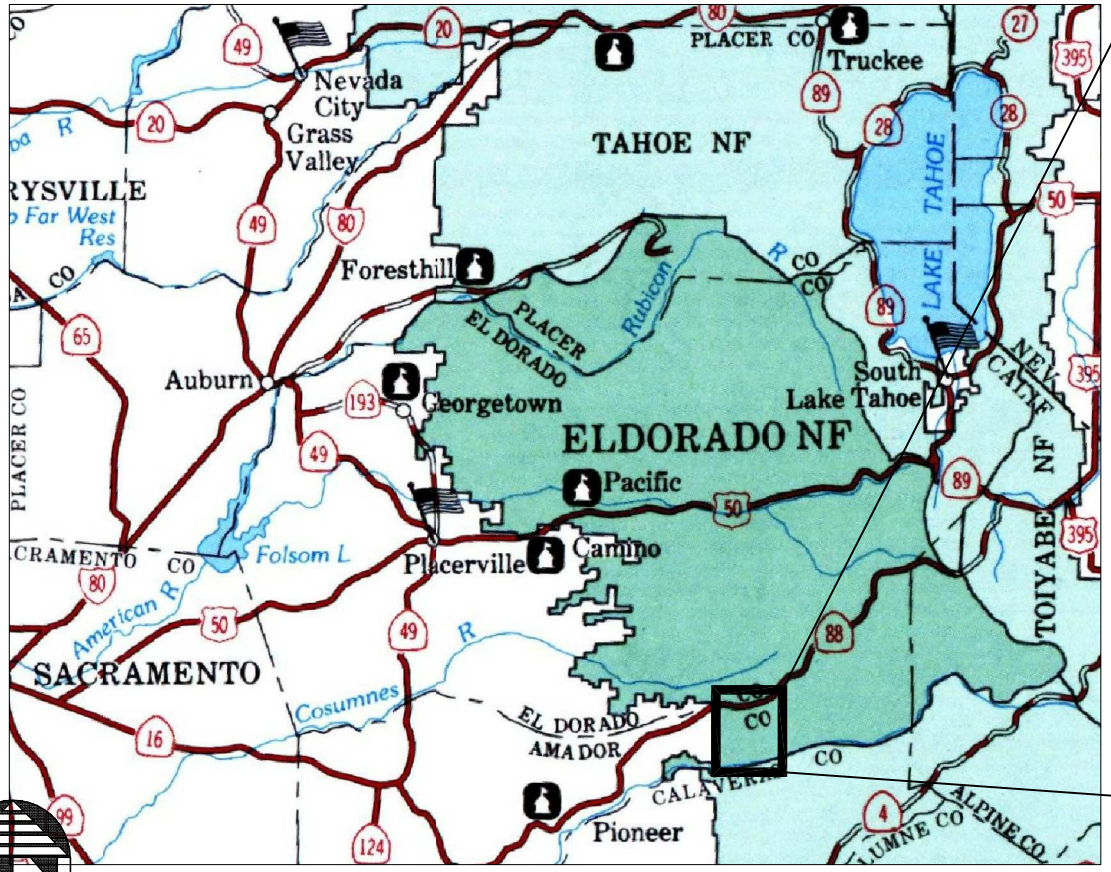
Assure that mulch used on the project is certified noxious weed free by the appropriate authority in the jurisdiction of use.

DRAFT

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION FIVE
EL DORADO COUNTY
ELDORADO NATIONAL FOREST
AMADOR RANGER DISTRICT
AMADOR COUNTY

Upper Mokelumne River Watershed Authority

POWER FIRE CULVERT IMPROVEMENT AND EROSION CONTROL PROJECT - BEAR RIVER SUB-WATERSHED



ELDORADO NATIONAL FOREST
VICINITY MAP

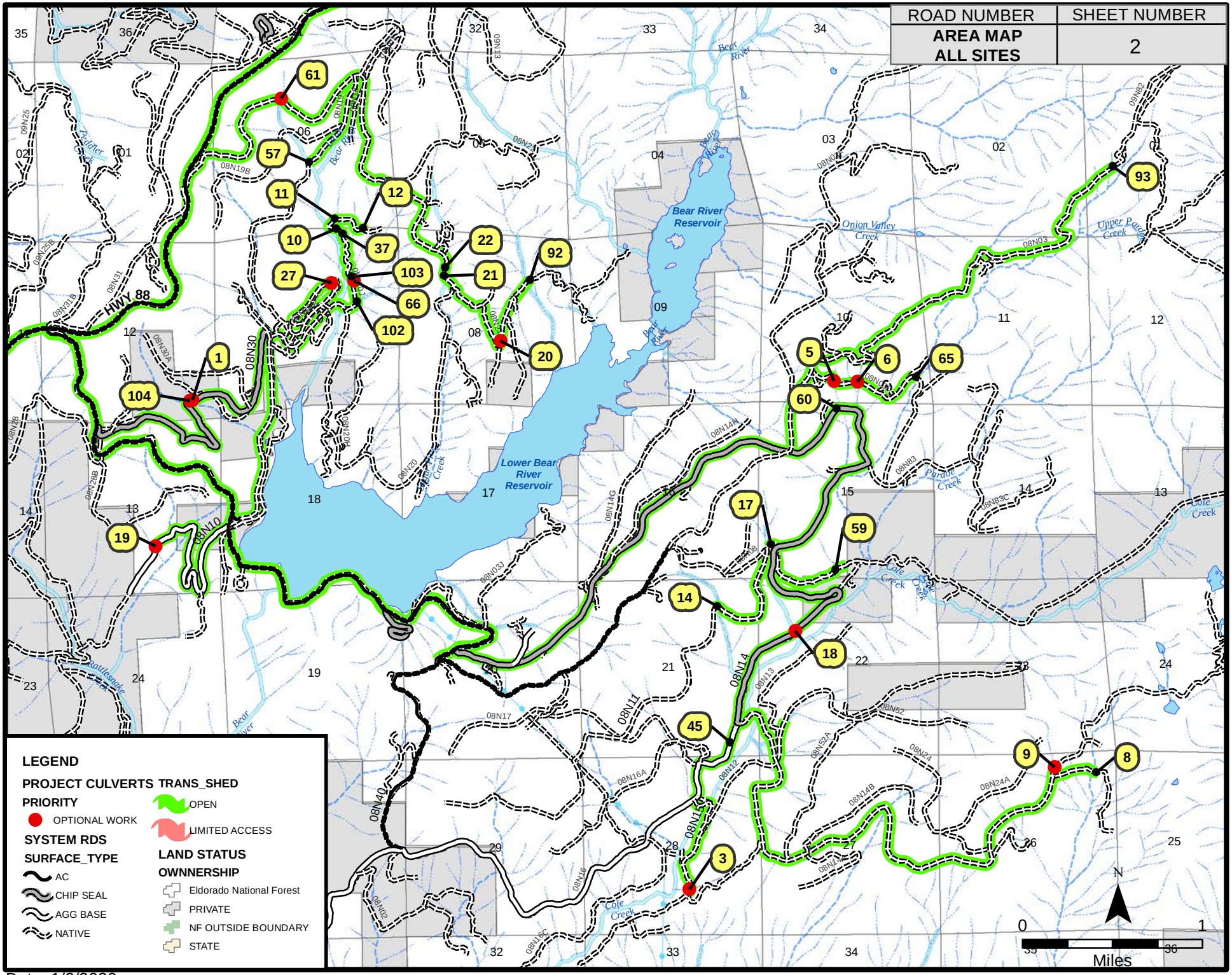
Rock Source:
Teichert Aggregates, Reed and Grahm or other approved site

TABLE OF CONTENTS

ROAD NO/ SITE NO	NAME	TYPE OF WORK	LENGTH (MILES)	SHEET NO.
	TITLE SHEET			1
	LOCATION MAPS			2-3
	NOTES & LEGENDS			4-6
	MATERIAL & QUANTITIES			7-10
08N03 / # 93	BEAR RIVER 4WD	REQUIRED	0.10	11
08N03D / # 65	COLE CROSSING	REQUIRED	0.10	12
08N08 / # 17,59	COLE MUD	REQUIRED	0.20	13
08N11 / # 14	LOWER COLE CREEK TIE	REQUIRED	0.10	14
08N14 / # 60	TANGLEFOOT CANYON	REQUIRED	0.10	15
08N16 / # 45	LOWER BEAR RIVER	REQUIRED	0.10	16
08N19 / # 57	LITTLE BEAR	REQUIRED	0.10	17
08N20J / # 10,37	RADICAL ROUTE	REQUIRED	0.20	18
08N20J / # 102,103	RADICAL ROUTE	REQUIRED	0.20	18
08N20J / # 11,12	RADICAL ROUTE	REQUIRED	0.20	18
08N21 / # 21,22	SUGAR PINE TIE	REQUIRED	0.20	19
08N21 / # 92	SUGAR PINE TIE	REQUIRED	0.10	19
NSR0814 / # 08	NSR0814	REQUIRED	0.10	20
	OPTIONAL AREA MAP			21
08N03D / # 5, 6	COLE CROSSING	OPTIONAL	0.10	22
08N10 / # 19	BEAR RIVER GA STA	OPTIONAL	0.20	23
08N14 / # 9	TANGLEFOOT CANYON	OPTIONAL	0.10	24
08N14 / # 18	TANGLEFOOT CANYON	OPTIONAL	0.10	25
08N15 / # 3	PENSTOCK COLE	OPTIONAL	0.10	26
08N18B / # 61	SWIMMING HOLE	OPTIONAL	0.10	27
08N20C / 27	LITTLE BEAR CAMPGROUND	OPTIONAL	0.10	28
08N20J / # 66	RADICAL ROUTE	OPTIONAL	0.20	29
08N21 / # 20	SUGAR PINE TIE	OPTIONAL	0.20	30
08N30 / # 01, 104	BEAR RIDGE	OPTIONAL	0.00	31
	GENERAL TYPICALS			32-47

REVISED
By Billy Ellis at 2:18 pm, 1/6/20

LANDMARK ENVIRONMENTAL Supporting clients through environmental compliance and planning. DATE	DATE	DATE	DATE	DATE
DESIGNED BY	APPROVED BY	DISTRICT RANGER	FOREST ENGINEER	FOREST SUPERVISOR


ROAD NUMBER
SHEET NUMBER
AREA MAP
ALL SITES
2
Bear River Reservoir
Lower Bear River Reservoir
HWY 88
61
57
11
12
10
37
27
103
66
102
22
21
92
20
1
104
19
93
5
6
65
60
17
59
14
18
45
9
8
3
LEGEND
PROJECT CULVERTS TRANS_SHED
PRIORITY
OPTIONAL WORK
SYSTEM RDS
SURFACE_TYPE
AC
CHIP SEAL
AGG BASE
NATIVE
OPEN
LIMITED ACCESS
LAND STATUS
OWNNERSHIP
Eldorado National Forest
PRIVATE
NF OUTSIDE BOUNDARY
STATE
N
0
1
Miles

Date: 1/2/2020

ROAD NUMBER	SHEET NUMBER
AREA MAP TRAGEDY	3

PIT DEVELOPEMENT AND USE:

THIS PIT MAY BE USED AS AN ALTERNATIVE TO COMMERCIAL SOURCES OF COMMON BORROW AND RIPRAP. THERE IS NO GUARANTEE AS TO THE AMOUNT AND ABILITY TO SUPPLY ALL REQUIRED MATERIAL.

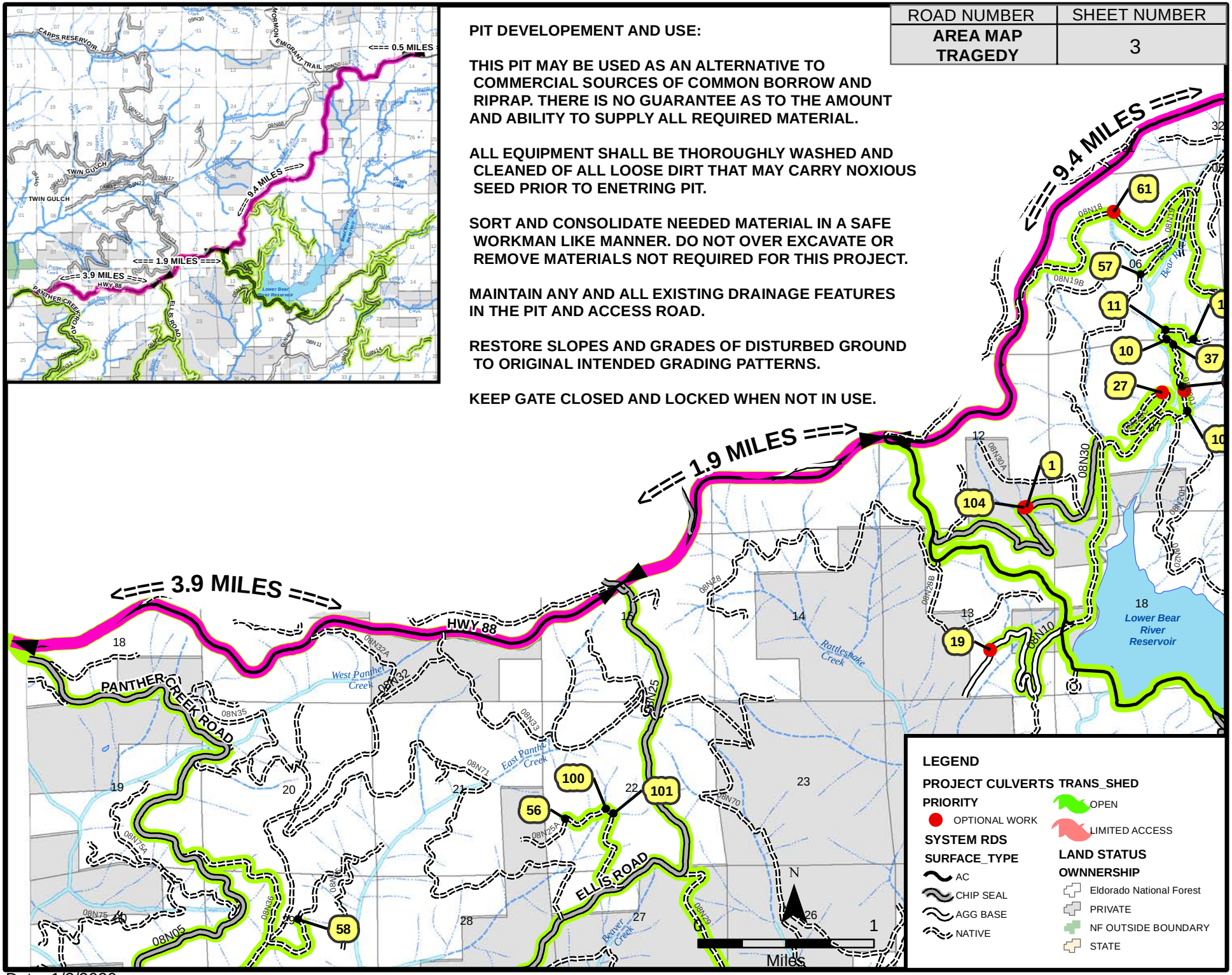
ALL EQUIPMENT SHALL BE THOROUGHLY WASHED AND CLEANED OF ALL LOOSE DIRT THAT MAY CARRY NOXIOUS SEED PRIOR TO ENETRING PIT.

SORT AND CONSOLIDATE NEEDED MATERIAL IN A SAFE WORKMAN LIKE MANNER. DO NOT OVER EXCAVATE OR REMOVE MATERIALS NOT REQUIRED FOR THIS PROJECT.

MAINTAIN ANY AND ALL EXISTING DRAINAGE FEATURES IN THE PIT AND ACCESS ROAD.

RESTORE SLOPES AND GRADES OF DISTURBED GROUND TO ORIGINAL INTENDED GRADING PATTERNS.

KEEP GATE CLOSED AND LOCKED WHEN NOT IN USE.



Date: 1/3/2020

PROJECT	SHEET NUMBER
BEAR	4

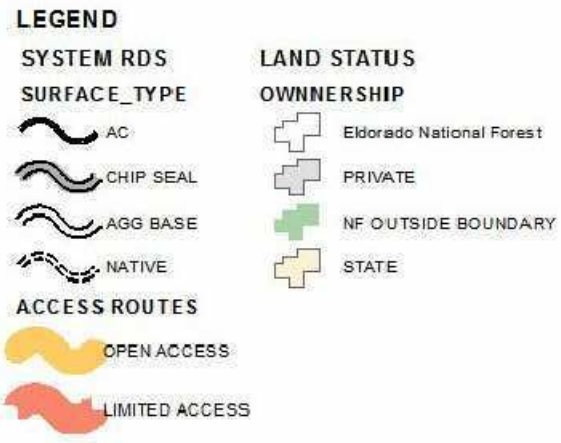
NOTES AND LEGEND

GENERAL NOTES

* Unless otherwise specified, notes apply to all roads.
** Outslope 3% unless otherwise SHOWN ON THE DRAWINGS.
* Cushion requirement is waived.
* Reconstruction - Widen as necessary to obtain min. specified width and to obtain outslope when specified. The actual width will vary. Cut slopes shall conform to existing. See Typicals.
* Fill slopes are 1 1/2:1, back slopes are 1:1, unless otherwise SHOWN ON THE DRAWINGS.
* Reconstruction- Suitable material removed from ditches, berms, outsloping operations, roadbed slides and culvert catch basins shall be incorporated into the roadbed.
* Unsuitable material shall be sidecast from the roadbed but not within 100 lf of any drainage.
* At intersections, the roadbed shall be graded to assure blending of two riding surfaces for a distance of 50 linear feet.
* Seed and mulch where specified in the Drawings. Seeding and mulching is incidental to other pay items.

ABBREVIATIONS

C.M.P. = Corrugated Pipe
C.M.P.A. = Corrugated Metal Pipe Arch
MES = Metal End Section
DI = Drop Inlet
IB = Inlet Basin
CB = Catch Basin
AC = Asphalt Concrete
AB = Aggregate Road Base
C.Y. = Cubic yard
L.F. = Linear Foot
EXIST = Existing feature
EOP = End of Project
CONST = Construct or install feature
RECONST = Reconstruct existing feature
MAINT = Maintain existing feature
WB = Waterbar
MEIOC - Maintain existing inslope/outslope configuration
RR = RIPRAP - Class II_Class III
TS = Tree and stump removal
- If preceded by a number - indicates number of trees. Typically within 100 lf of station.
- If only TS displayed , DBH = 11" to 23" DBH tree
- If followed by a 'M' = 24" to 36" DBH tree to be removed
- If followed by a 'L' = Over 36" DBH tree
- If only TS displayed , DBH = 11" to 23" DBH tree



NOTES AND LEGEND

PROJECT	SHEET NUMBER
BEAR	5

ROAD NUMBER	SPECIAL NOTES
ALL ROADS	Erosion control measures are required at all Staging Areas and when excavation occurs in or near wet drainages. Staging Area Erosion Control is incidental to other paid work. Contractor to select the type of erosion control necessary for work. See typicals for approved methods of erosion control. All work by Contractor at the Tragedy Springs Pit is incidental to other paid work items, including but not limited to; Grading and shaping, Erosion Control if required, sorting and grading rock, and any clean up that may be necessary to bring site back to pre-entry conditions. Locations of work to be done will be staked on the ground by the Contracting Officers Representative. Reconditioning of Roadbed consist of all grading and shaping required to complete work at each site. The construction limits for each site, unless shown otherwise in the Drawings, is 150 linear feet either side of site or 300 linear feet total. All roads used by Contractor during road construction shall be maintained by Contractor. C.M.P. lengths are approximate. Payment for C.M.P. will be for the lengths necessary to complete the job. Existing culverts that are to be replaced shall be removed from government land at Contractors expense. Unless shown in the Schedule of Items, disposal is incidental to other Pay Items. Riprap, Class II, may come from a commercial source or may be collected on site as long as it meets size requirements. Units for riprap are in cubic yards (CY) and will be measured in place for payment. Riprap, Class III, may come from a commercial source or may be generated and collected at the Tragedy Springs Pit site as long as it meets size requirements. Units for riprap are in cubic yards (CY) and will be measured in place for payment. **Commercial Rock Sources** - *Aggregate shall be obtained from an approved source, Certified weed free and certified to contain no more than 0.25 % asbestos to be in compliance with California Health and Safety Code Sections 93105 and 93106 .* **Rock source submittals are required.** Weight tickets for materials from commercial sources are required for payment when units are in Tons. Weight tickets shall specify which road rock the products were delivered to. Failure to comply may lead to a delay in payment for rock and associated work. Forest Service will designate borrow sites as needed. Contractor shall submit a **Traffic Control Plan** for extended road closures prior to work. Road 08N21 accesses a number of private residences and a summer home tract as well as several popular trailheads and other recreational sites.

NOTES AND LEGEND

PROJECT	SHEET NUMBER
BEAR	6

ROAD NUMBER	SPECIAL NOTES
	Siera Nevada Yellow-legged Frog (SNYLF) Site Requirements-
ALL ROADS	If SNYLF is sited within any site, operations will cease in the sighting area and a Forest Service aquatic biologists shall be informed pf sighting immediately.
SITES: 8,14,17 18,92 104	When Shown In The Drawings, surveys shall be conducted prior to implementation of the project where heavy equipment will enter suitable SNYLF habitat and where water drafting or diversion work occurs in suitable SNYLF habitat.
SITES: 57, 61, 65	In critical habitat areas or when Shown In The Drawings, A Forest service biologist or an approved biological monitor will be present during culvert reconstruction and/or dewatering sites that fall within utilized SNYLF habitat.
	Within suitable SNYLF habitat sites; 1) tightly woven fiber netting or similar material shall be not used for erosion control or other purposes to prevent SNYLF being trapped, injured or killed, and 2) plastic mono-filament netting or similar material shall not be used since SNYLF may become entangled or trapped in it. Use Certified weed free bales. See Typicals.
ALL ROADS	Existing waterholes and other aquatic sites including ponds, lakes and streams used for water drafting or diverting would be surveyed for Aquatic Threaten and Endangered Species (TES). In the event TES species are found to occur at drafting sites; sites will not be used.
	The use of low velocity water pumps and screening devices for pumps will be utilized during drafting or dewatering for culvert reconstruction to minimize risk to SNYLF. A drafting box measuring 2 feet on all sides covered in a maximum of 0.25 inch screening is required. Drafting would be from the deepest water source, near the bottom. See Typicals.

MATERIALS LIST AND QUANTITIES

PROJECT	SHEET NUMBER
BEAR	7

SPECIFICATION DATA									
		Road No.	08N03 / # 93	08N03D / # 5, 6	08N03D / # 65	08N08 / # 17,59	08N10 / # 19	08N11 / # 14	SUB TOTAL
		Type:	REQUIRED	OPTIONAL	REQUIRED	REQUIRED	OPTIONAL	REQUIRED	
Spec No.	Item Description	Units	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	
15101	Mobilization - Applies to Project	LS	ONE TIME COST						
15701	Erosion Control - SNYLF Barrier / Silt Fence	LS			1	1		1	3
15702	Erosion Control - Silt Fence	LF	50	100		50	50		250
20101	Clearing & Grubbing, Disposal of Tops and Limbs-CHIP, Logs-DECK, and Stumps-SCATTER or As Specified In The Drawings..	LS			1		1	1	3
20303	Removal and Disposal of Culverts	Each		2		2	1	1	6
20401	Lead Off Ditch - Includes Crushed 4" Rock	LF	25						25
20402	Drainage Excavation, Type 4' Ditch - Includes Crushed 4" Rock	LF	75	110					185
20403	Drainage Excavation, Type Catch Basin	Each		2		1			3
20404	Drainage Excavation, Type Inlet Basin	Each					1		1
20411	Rock Lined Outlet Channel - Includes all Excavation, Labor and Materials.	LF			50				50
20701	Geotextile Permeable Separator - Includes All Rock, Fabric and Work to Complete Job.	Ton	24						24
25101	Placed Riprap, Class III (Tragedy Pit / Commercial Source)	CY			40	16		40	96
30101	Aggregate Base, Gradation B, Compaction Method D	Ton	72	48	48	48	24	96	336
30301	Reconditioning of Roadbed, Roller Compaction - Method B	LS	1	2	1	2	1	1	8
60201	24-Inch Corrugated Metal Pipe, 0.064-Inch thk FE, Method B. Includes De-Watering If Necessary.	LF		70			40		110
60204	42" x 29" Arch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF				30			30
60205	48-Inch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF				30		60	90
60206	57" x 38" Arch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF			30				30
60214	42" x 29" Arch Metal End section	Each				1			1
60215	48" Metal End section	Each				1		1	2
60216	57" x 38" Arch Metal End section	Each			1				1

MATERIALS LIST AND QUANTITIES

PROJECT	SHEET NUMBER
BEAR	8

SPECIFICATION DATA									SUB TOTAL
		Road No.	08N14 / # 9,18	08N14 / # 60	08N15 / # 3	08N16 / # 45	08N18B / # 61	08N19 / # 57	
		Type:	OPTIONAL	REQUIRED	OPTIONAL	REQUIRED	OPTIONAL	REQUIRED	
Spec No.	Item Description	Units	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	
15101	Mobilization - Applies to Project	LS	ONE TIME COST						
15701	Erosion Control - SNYLF Barrier / Silt Fence	LS	1				1	1	3
15702	Erosion Control - Silt Fence	LF	30	50	30	50			160
20101	Clearing & Grubbing, Disposal of Tops and Limbs-CHIP, Logs-DECK, and Stumps-SCATTER or As Specified In The Drawings..	LS	1	1	1		1	1	5
20303	Removal and Disposal of Culverts	Each	2	1	1	1	1	1	7
20304	Surface Saw Cut, Remove and Dispose AC Surface	SY	133	48		20			201
20403	Drainage Excavation, Type Catch Basin	Each				1			1
20404	Drainage Excavation, Type Inlet Basin	Each			1		1		2
20406	Drainage Excavation, Type Rocked Swale - Includes Riprap(Class II) and Screened Aggregate (Grade N).	Each	1						1
20409	Drainage Excavation, Type Rolling Dip	Each						2	2
25101	Placed Riprap, Class III (Tragedy Pit / Commercial Source)	CY	70	26				100	196
30101	Aggregate Base, Gradation B, Compaction Method D	Ton	24	10	24	5	24	120	207
30301	Reconditioning of Roadbed, Roller Compaction - Method B	LS	2	1	1	1	1	1	7
40401	Hot Bituminous Patching- 1/2" Caltrans Spec. Includes All Materials and Labor To Complete Work. AC Cut and Removal Paid Separately.	SY	133	48		20			201
60201	24-Inch Corrugated Metal Pipe, 0.064-Inch thk FE, Method B. Includes De-Watering If Necessary.	LF			30				30
60202	28" x 20" Arch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF				40	25		65
60203	36-Inch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF		50					50
60207	60-Inch Corrugated Metal Pipe, 0.109-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF	70						70
60210	83" x 57" Arch Corrugated Metal Pipe, 0.138-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF						50	
60212	28" x 20" Arch Metal End section	Each				1			
60217	60" Metal End section	Each	1						
60220	83" x 57" Arch Metal End section	Each						1	
60501	Culvert Underdrains - Includes All Geotextile Fabric, Rock and Labor To complete Work	CY	13	3					
60702	Channel Excavation and Repair (50 LF)	Each						1	
61901	Install Metal Gate, Size 16 feet	Each					1		
61903	Rock Boulder Barricade	Each						4	

MATERIALS LIST AND QUANTITIES

PROJECT	SHEET NUMBER
BEAR	9

SPECIFICATION DATA									
		Road No.	08N20C / 27	08N20J / # 11,12	08N20J / # 10,37	08N20J / # 66	08N20J / # 102,103	08N21 / # 21,22	SUB TOTAL
		Type:	OPTIONAL	REQUIRED	REQUIRED	OPTIONAL	REQUIRED	REQUIRED	
Spec No.	Item Description	Units	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	
15101	Mobilization - Applies to Project	LS	ONE TIME COST						
15701	Erosion Control - SNYLF Barrier / Silt Fence	LS							
15702	Erosion Control - Silt Fence	LF	50	100	100		100	100	450
20101	Clearing & Grubbing, Disposal of Tops and Limbs-CHIP, Logs-DECK, and Stumps-SCATTER or As Specified In The Drawings..	LS			1		1		2
20303	Removal and Disposal of Culverts	Each	1	2	2		2	2	9
20401	Lead Off Ditch - Includes Crushed 4" Rock	LF						80	80
20402	Drainage Excavation, Type 4' Ditch - Includes Crushed 4" Rock	LF			40				40
20403	Drainage Excavation, Type Catch Basin	Each	1		1		1	2	5
25101	Placed Riprap, Class III (Tragedy Pit / Commercial Source)	CY				6	8		14
30101	Aggregate Base, Gradation B, Compaction Method D	Ton	24	48	48	48	48	48	264
30301	Reconditioning of Roadbed, Roller Compaction - Method B	LS	1	2	2	1	2	2	10
60201	24-Inch Corrugated Metal Pipe, 0.064-Inch thk FE, Method B. Includes De-Watering If Necessary.	LF		40	70				110
60202	28" x 20" Arch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF	40					80	120
60203	36-Inch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF		30					30
60204	42" x 29" Arch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF					30		30
60205	48-Inch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF					40		40
60214	42" x 29" Arch Metal End section	Each					1		1
60215	48" Metal End section	Each					1		1

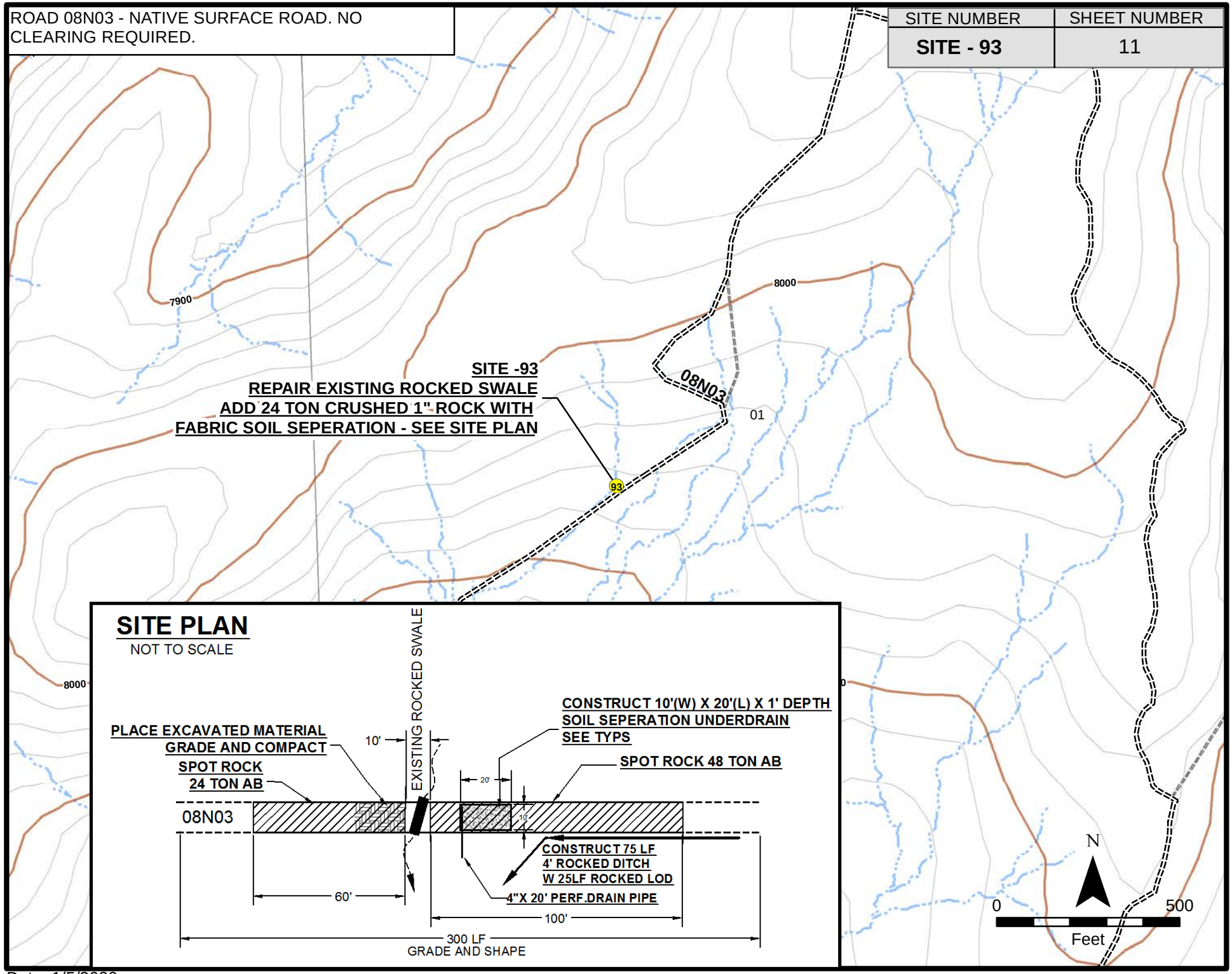
PROJECT	SHEET NUMBER
BEAR	10

MATERIALS LIST AND QUANTITIES

SPECIFICATION DATA		Road No.	08N21 / # 20	08N21 / # 92	08N30 / # 01, 104	NSR0814 / # 08			SUB TOTAL
		Type:	OPTIONAL	REQUIRED	OPTIONAL	REQUIRED			
Spec No.	Item Description	Units	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	
15101	Mobilization - Applies to Project	LS	ONE TIME COST						
15701	Erosion Control - SNYLF Barrier / Silt Fence	LS		1	1	1			3
15702	Erosion Control - Silt Fence	LF	50		50				100
20101	Clearing & Grubbing, Disposal of Tops and Limbs-CHIP, Logs-DECK, and Stumps-SCATTER or As Specified In The Drawings..	LS				1			1
20303	Removal and Disposal of Culverts	Each	1	1	1	1			4
20403	Drainage Excavation, Type Catch Basin	Each	1						1
20404	Drainage Excavation, Type Inlet Basin	Each			2				2
20410	Excavation and Embankment - Placement Method 5	LS		1		1			2
25101	Placed Riprap, Class III (Tragedy Pit / Commercial Source)	CY				50			50
30101	Aggregate Base, Gradation B, Compaction Method D	Ton	24		48				72
30103	Crushed Aggregate - 4"+ Crushed Rock	Ton		48					48
30301	Reconditioning of Roadbed, Roller Compaction - Method B	LS	1	1	2	1			5
60202	28" x 20" Arch Corrugated Metal Pipe, 0.064-Inch Thk FE, Method B. Includes De-Watering If Necessary.	LF	30		60				90
61902	Earth and Log Barricade	Each				1			1

ROAD 08N03 - NATIVE SURFACE ROAD. NO CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE - 93	11



SITE PLAN

NOT TO SCALE

Date: 1/5/2020

ROAD 08N03D - NATIVE SURFACED ROAD. MINOR CLEARING REQUIRED. SCATTER SLASH AND STUMPS.

SITE NUMBER	SHEET NUMBER
SITE - 65	12

NOTE:
SITE # 65 HAS A PROTECTED SENSITIVE SPECIES (SNYLF) ASSOCIATED WITH IT. A SURVEY IS REQUIRED 1 WEEK BEFORE WORK AND REQUIRES AN ON-SITE MONITOR. EROSION CONTROL PLAN REQUIRED. NO DE-WATERING NECESSARY.

SITE #65 — Pardoe Creek
INSTALL OVERFLOW PIPE
INSTALL 57"X38"X30' ARCH CMP W/MES
SEE SITE PLAN FOR INFO.

OPTIONAL SITE #6

OPTIONAL SITE #5

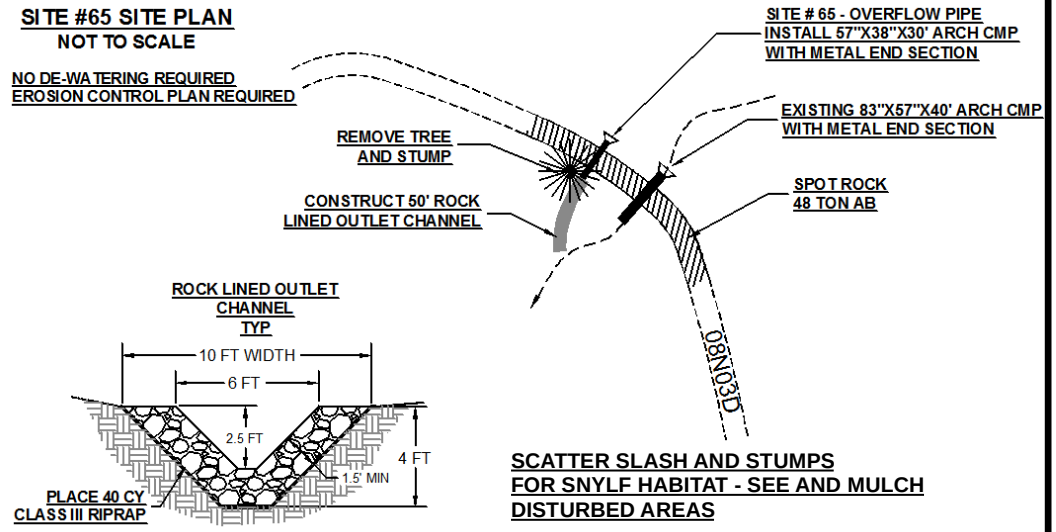
08N03H
08N03
08N03F
08N03D
08N14

7300
7100
7000
6900
6800
7000

10
11
15

N
0
500
Feet

SITE #65 SITE PLAN
NOT TO SCALE



SCATTER SLASH AND STUMPS FOR SNYLF HABITAT - SEE AND MULCH DISTURBED AREAS

Date: 1/2/2020

ROAD 08N08 - NATIVE SURFACED ROAD. NO CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE - 17_59	13

NOTE:
SITE #17 - SNYLF HABITAT : FOLLOW PROTOCOLS FOR SNYLF. A SURVEY IS REQUIRED 1 WEEK BEFORE WORK. EROSION CONTROL PLAN REQUIRED. NO DEWATERING REQUIRED WHEN DRY.

SITE -17
REMOVE EXISTING 18"CMP
INSTALL 48" X 30' CMP W/MES
SPOT ROCK 24 TON AB
6 CY CLASS III RIRRAP
INLET/OUTLET SLOPE
SEE SITE PLAN FOR ADDITIONAL INFO.

SITE -59
REMOVE EXISTING 18"CMP
INSTALL 42"X29" X 30 ARCH CMP W/CB
SPOT ROCK 24 TON AB
4 CY CLASS III RIRRAP
OUTLET SLOPE

16
15
08N08A
08N08
08N14
08N13
6800
6700
6600
6500
6400
6300
17
59
Cole Creek
N
0
500
Feet

17 SITE PLAN

NOT TO SCALE

EROSION CONTROL PLAN REQUIRED

SITE 17
REMOVE EXIST 18 CMP
INSTALL 48" X 30' CMP W/MES
SPOT ROCK 24 TON AB

PLACE 6 CY CLASS III RIPRAP

SPOT ROCK 24 TONS AB

EXIST 18 CMP

PLACE 6 CY CLASS III RIPRAP

08N08
08N14

Date: 1/2/2020

ROAD 08N11 - NATIVE SURFACED ROAD. CLEARING REQUIRED. SCATTER STUMPS. CHIP SLASH.

SITE NUMBER	SHEET NUMBER
SITE - 14	14

NOTE:

THIS SITE HAS A LIMITED OPERATING PERIOD TO PROTECT SENSITIVE SPECIES. NO WORK ON THIS SITE MARCH 1 TO AUGUST 15.

SNYLF HABITAT : FOLLOW PROTOCOLS FOR SNYLF. A SURVEY IS REQUIRED 1 WEEK BEFORE WORK. EROSION CONTROL PLAN REQUIRED. NO DEWATERING REQUIRED WHEN DRY.

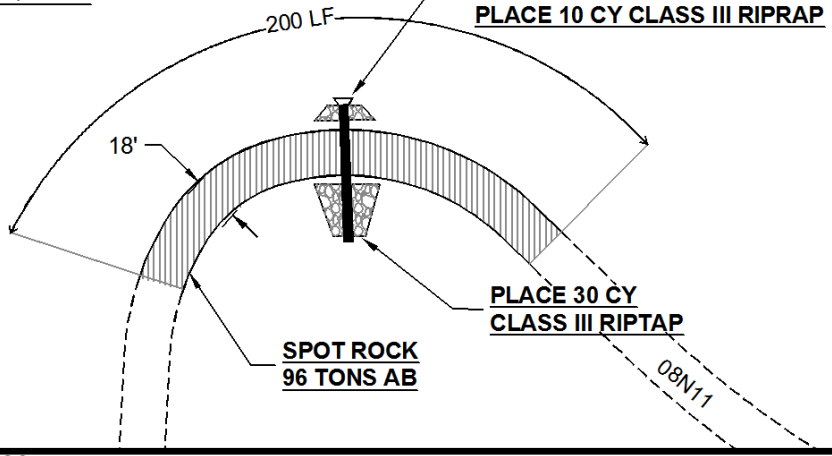
SITE -14
REMOVE EXISTING 24"CMP
INSTALL 48 X 60 CMP W / MES
SPOT ROCK 96 TON AB
40 CY CLASS III RIRRAP OUTLET

08N08 16 6700
08N08A
15
08N08
6600
08N14
14
08N11
22
6300
6400
18
08N14
6200
08N13
N
0 500
Feet
Cole Creek

14 SITE PLAN

NOT TO SCALE

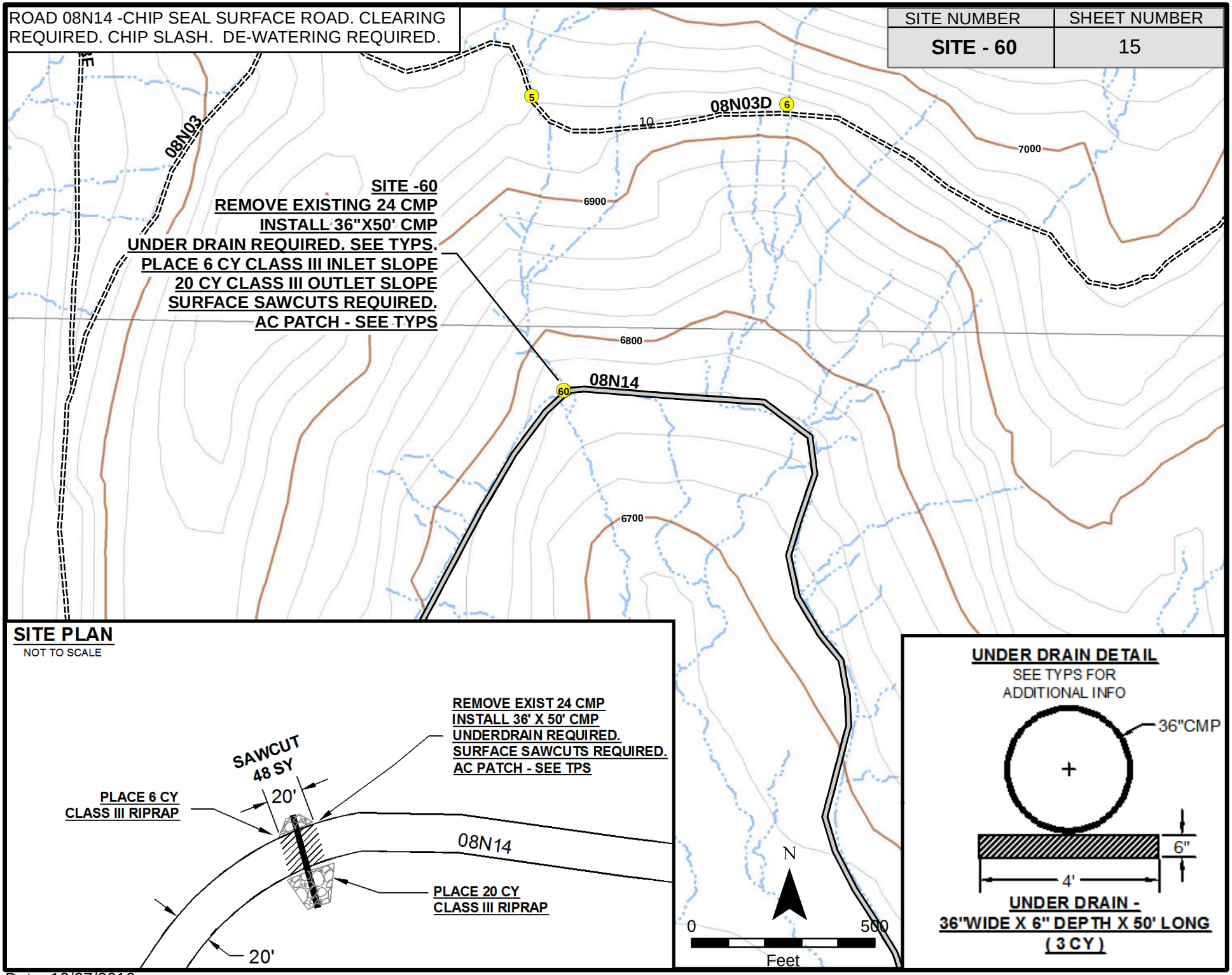
EROSION CONTROL PLAN REQUIRED



Date: 1/2/2020

ROAD 08N14 -CHIP SEAL SURFACE ROAD. CLEARING REQUIRED. CHIP SLASH. DE-WATERING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE - 60	15



SITE PLAN

NOT TO SCALE

UNDER DRAIN DETAIL

SEE TYPS FOR ADDITIONAL INFO

UNDER DRAIN - 36"WIDE X 6" DEPTH X 50' LONG (3 CY)

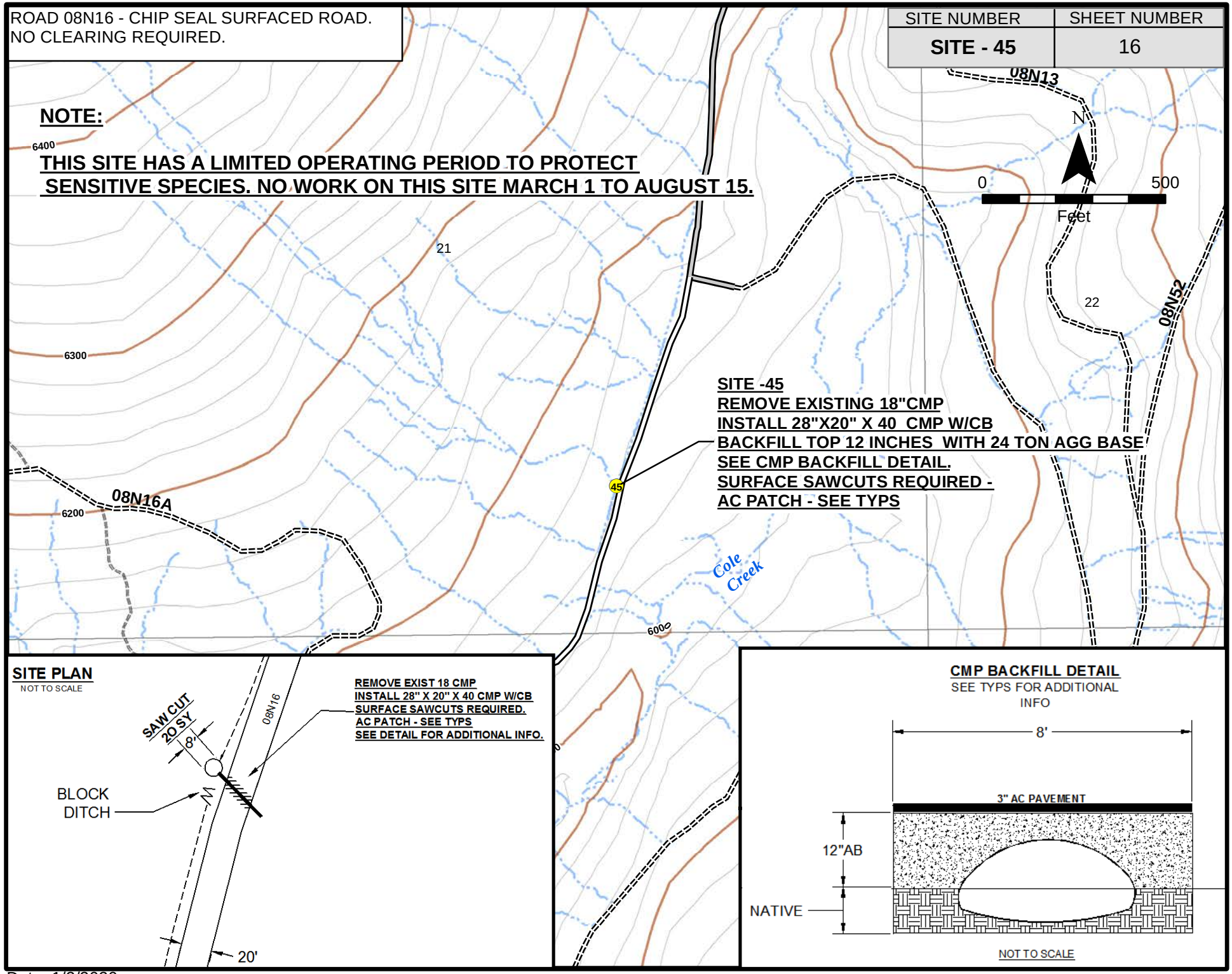
Date: 12/27/2019

ROAD 08N16 - CHIP SEAL SURFACED ROAD.
NO CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE - 45	16

NOTE:

THIS SITE HAS A LIMITED OPERATING PERIOD TO PROTECT SENSITIVE SPECIES. NO WORK ON THIS SITE MARCH 1 TO AUGUST 15.



SITE -45
REMOVE EXISTING 18"CMP
INSTALL 28"X20" X 40 CMP W/CB
BACKFILL TOP 12 INCHES WITH 24 TON AGG BASE
SEE CMP BACKFILL DETAIL.
SURFACE SAWCUTS REQUIRED -
AC PATCH - SEE TYPS

SITE PLAN
NOT TO SCALE

REMOVE EXIST 18 CMP
INSTALL 28" X 20" X 40 CMP W/CB
SURFACE SAWCUTS REQUIRED.
AC PATCH - SEE TYPS
SEE DETAIL FOR ADDITIONAL INFO.

CMP BACKFILL DETAIL
SEE TYPS FOR ADDITIONAL INFO

NOT TO SCALE

Date: 1/2/2020

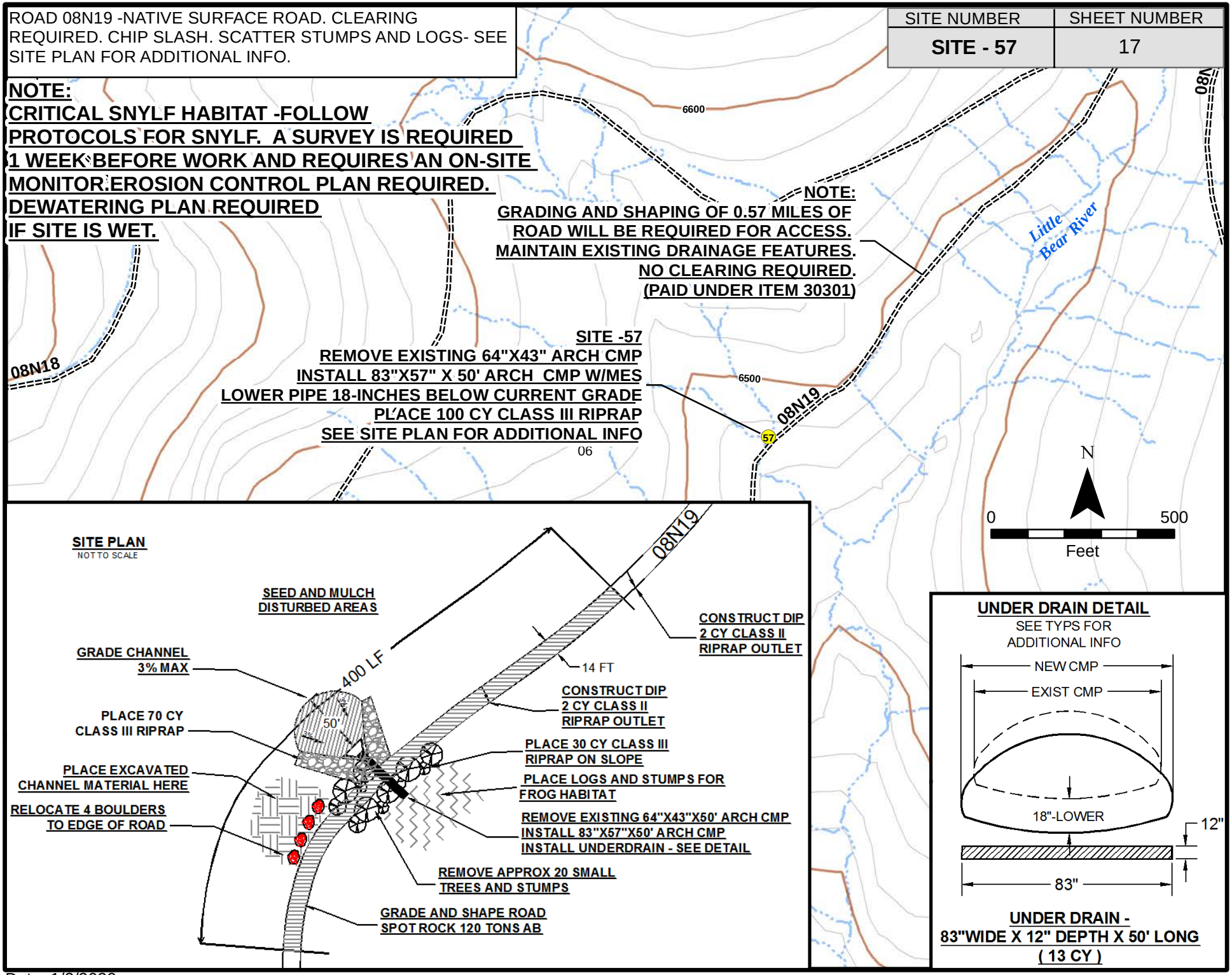
ROAD 08N19 -NATIVE SURFACE ROAD. CLEARING REQUIRED. CHIP SLASH. SCATTER STUMPS AND LOGS- SEE SITE PLAN FOR ADDITIONAL INFO.

SITE NUMBER	SHEET NUMBER
SITE - 57	17

NOTE:
CRITICAL SNYLF HABITAT -FOLLOW PROTOCOLS FOR SNYLF. A SURVEY IS REQUIRED 1 WEEK BEFORE WORK AND REQUIRES AN ON-SITE MONITOR. EROSION CONTROL PLAN REQUIRED. DEWATERING PLAN REQUIRED IF SITE IS WET.

NOTE:
GRADING AND SHAPING OF 0.57 MILES OF ROAD WILL BE REQUIRED FOR ACCESS. MAINTAIN EXISTING DRAINAGE FEATURES. NO CLEARING REQUIRED. (PAID UNDER ITEM 30301)

SITE -57
REMOVE EXISTING 64"X43" ARCH CMP
INSTALL 83"X57" X 50' ARCH CMP W/MES
LOWER PIPE 18-INCHES BELOW CURRENT GRADE
PLACE 100 CY CLASS III RIPRAP
SEE SITE PLAN FOR ADDITIONAL INFO



SITE PLAN
NOT TO SCALE

UNDER DRAIN DETAIL
SEE TYPS FOR ADDITIONAL INFO

UNDER DRAIN -
83"WIDE X 12" DEPTH X 50' LONG
(13 CY)

Date: 1/2/2020

ROAD 08N20J - NATIVE SURFACED ROAD. MINOR CLEARING REQUIRED. SCATTER SLASH AND STUMPS.

SITE NUMBER	SHEET NUMBER
SITE-10-11-12-37 -102-103	18

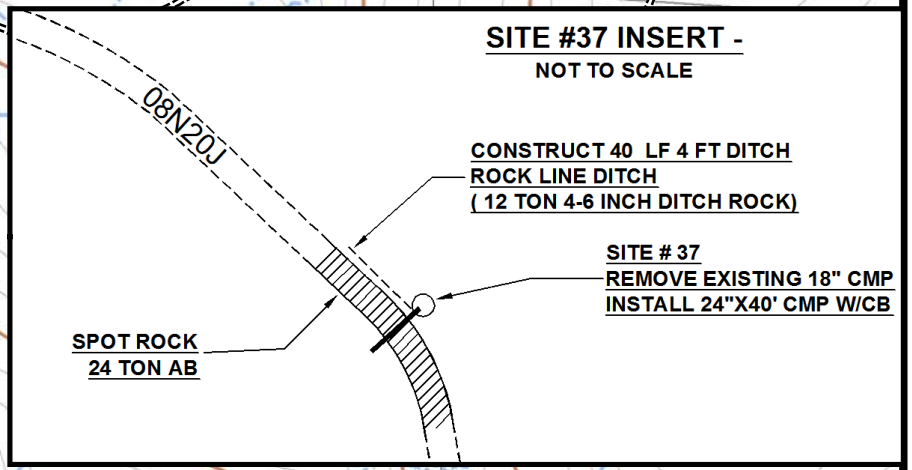
SITE -11
REMOVE EXISTING 18"CMP
INSTALL 24 X 40 CMP
SPOT ROCK 24 TON AB

SITE -12
REMOVE EXISTING 18"CMP
INSTALL 36 X 30 CMP
SPOT ROCK 24 TON AB

SITE -10
REMOVE EXISTING 18"CMP
INSTALL 24 X 30 CMP
SPOT ROCK 24 TON AB
MINOR CLEARING REQUIRED

SITE -37
REMOVE EXISTING 18"CMP
INSTALL 24 X 40 CMP W/CB
SPOT ROCK 24 TON AB
SEE INSERT FOR ADDITIONAL INFO.

SITE #37 INSERT -
NOT TO SCALE



SITE -103
REMOVE EXISTING 18"CMP
REMOVE LARGE STUMP AT INLET
INSTALL 42"X29"X30' ARCH CMP W / MES, W/CB
SPOT ROCK 24 TON AB

SITE -66 OPTIONAL

SITE -102
REMOVE EXISTING 36"CMP
INSTALL 48 X 40 CMP W / MES
PLACE 8 CY CLASS III RIPRAP OUTLET SLOPE
SPOT ROCK 24 TON AB

Date: 1/2/2020

ROAD 08N21 - NATIVE SURFACED ROAD.
MINOR CLEARING REQUIRED. SCATTER SLASH.

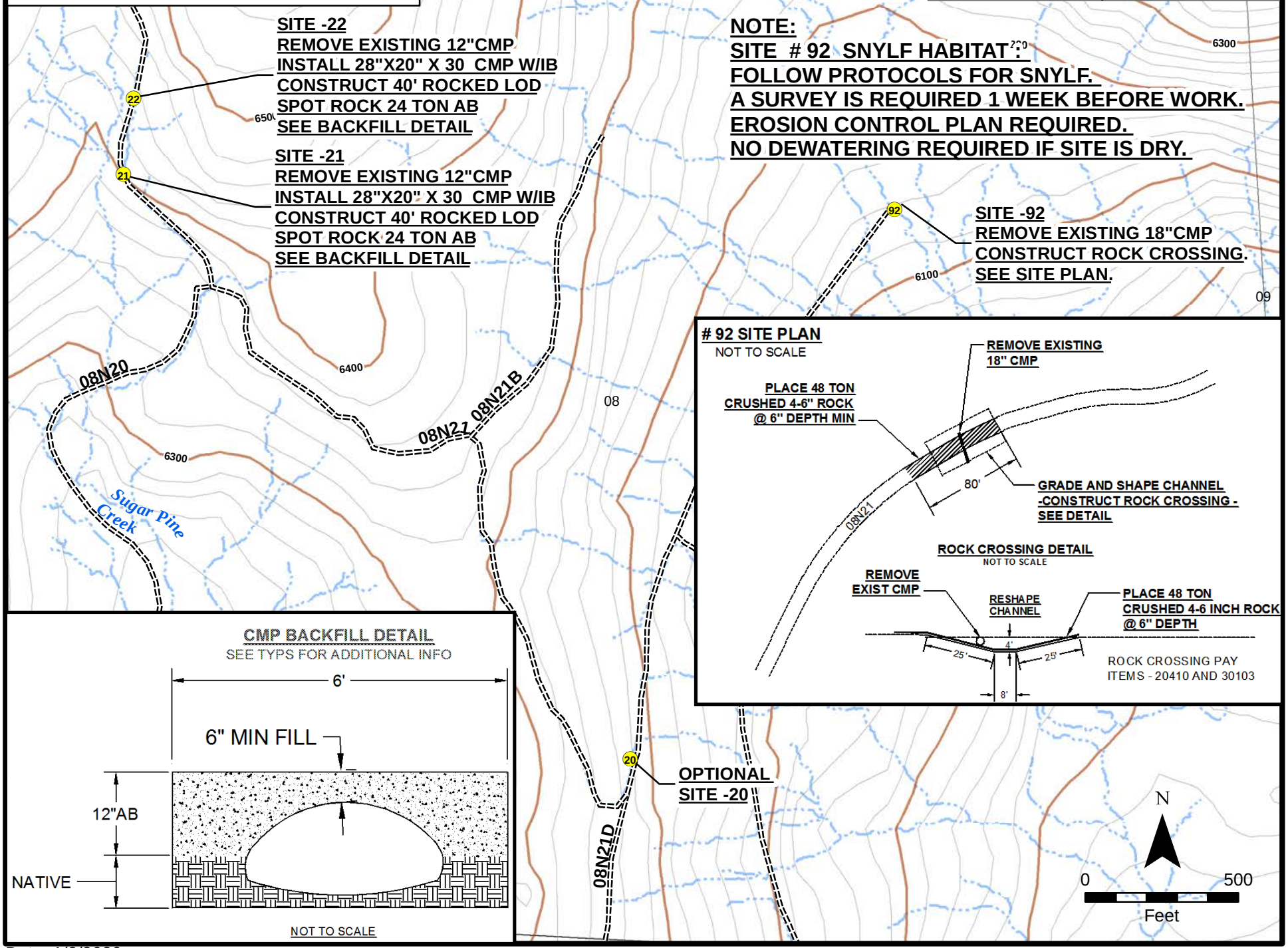
SITE NUMBER	SHEET NUMBER
SITE-21_22_92	19

SITE -22
REMOVE EXISTING 12"CMP
INSTALL 28"X20" X 30 CMP W/IB
CONSTRUCT 40' ROCKED LOD
SPOT ROCK 24 TON AB
SEE BACKFILL DETAIL

SITE -21
REMOVE EXISTING 12"CMP
INSTALL 28"X20" X 30 CMP W/IB
CONSTRUCT 40' ROCKED LOD
SPOT ROCK 24 TON AB
SEE BACKFILL DETAIL

NOTE:
SITE # 92 SNYLF HABITAT:
FOLLOW PROTOCOLS FOR SNYLF.
A SURVEY IS REQUIRED 1 WEEK BEFORE WORK.
EROSION CONTROL PLAN REQUIRED.
NO DEWATERING REQUIRED IF SITE IS DRY.

SITE -92
REMOVE EXISTING 18"CMP
CONSTRUCT ROCK CROSSING.
SEE SITE PLAN.



 # 92 SITE PLAN
NOT TO SCALE

CMP BACKFILL DETAIL
SEE TYPS FOR ADDITIONAL INFO

OPTIONAL
SITE -20

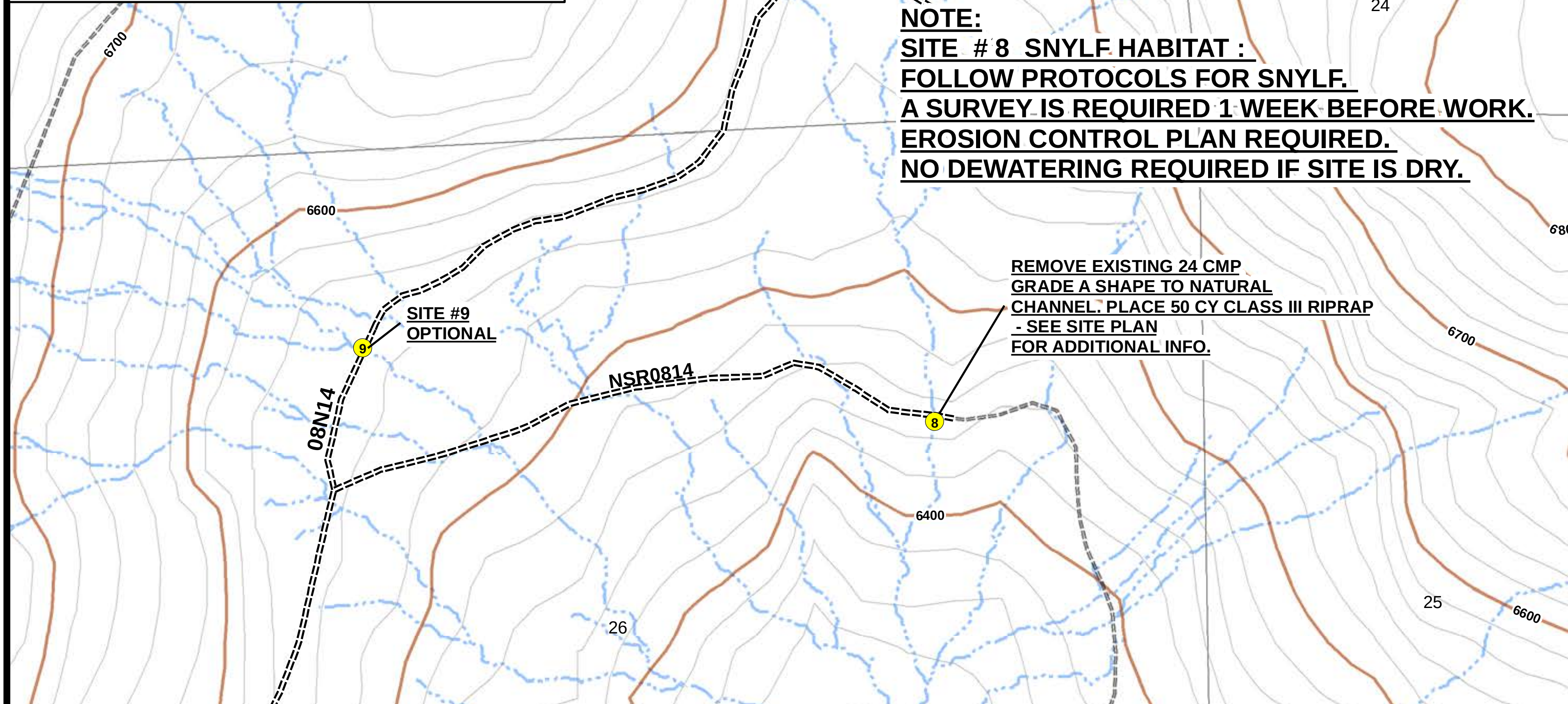
N
0 500
Feet

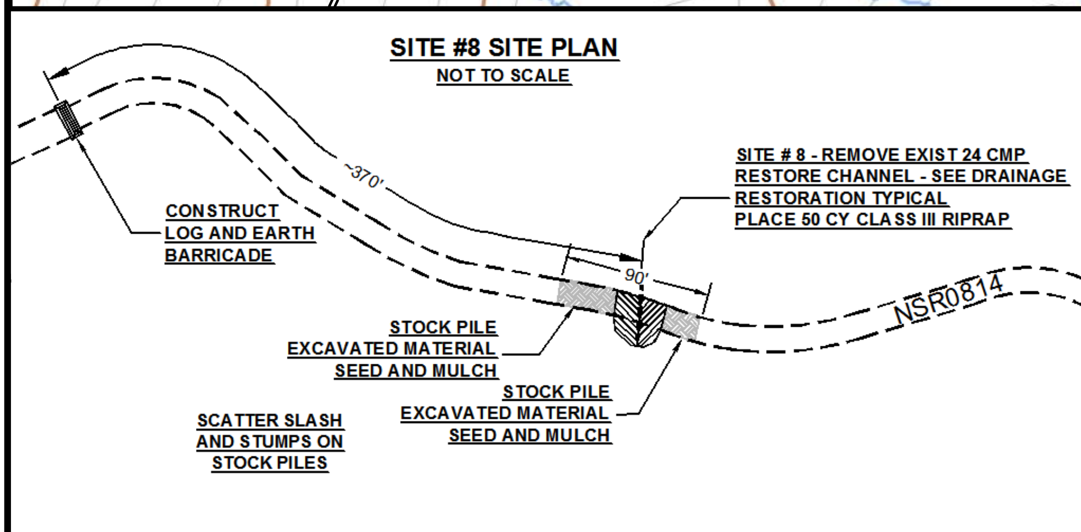
Date: 1/2/2020

ROAD NSR0814 - NATIVE SURFACED ROAD. MINOR CLEARING REQUIRED. SCATTER SLASH AND STUMPS.

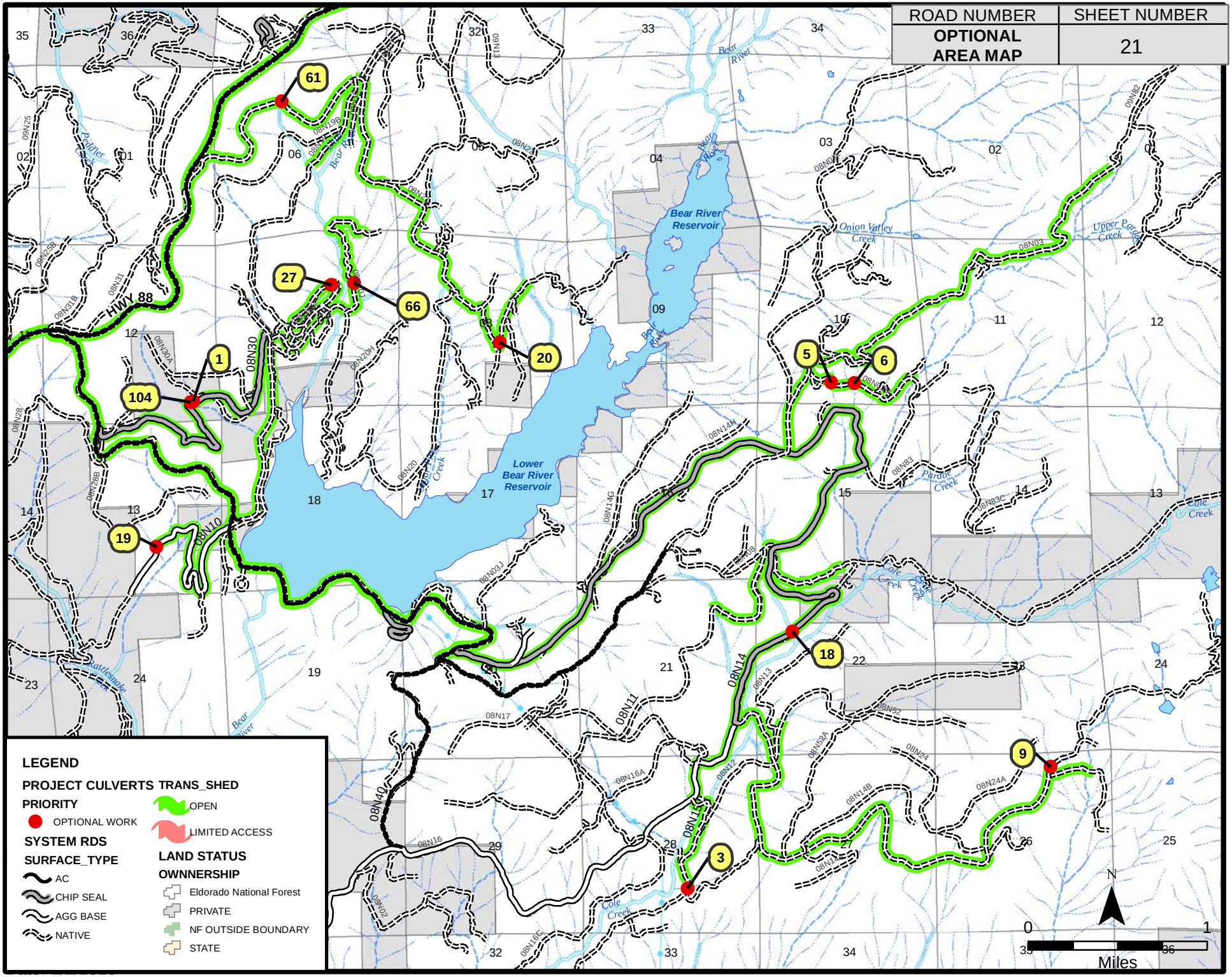
SITE NUMBER	SHEET NUMBER
SITE - 8	20

NOTE:
SITE # 8 SNYLF HABITAT :
FOLLOW PROTOCOLS FOR SNYLF.
A SURVEY IS REQUIRED 1 WEEK BEFORE WORK.
EROSION CONTROL PLAN REQUIRED.
NO DEWATERING REQUIRED IF SITE IS DRY.



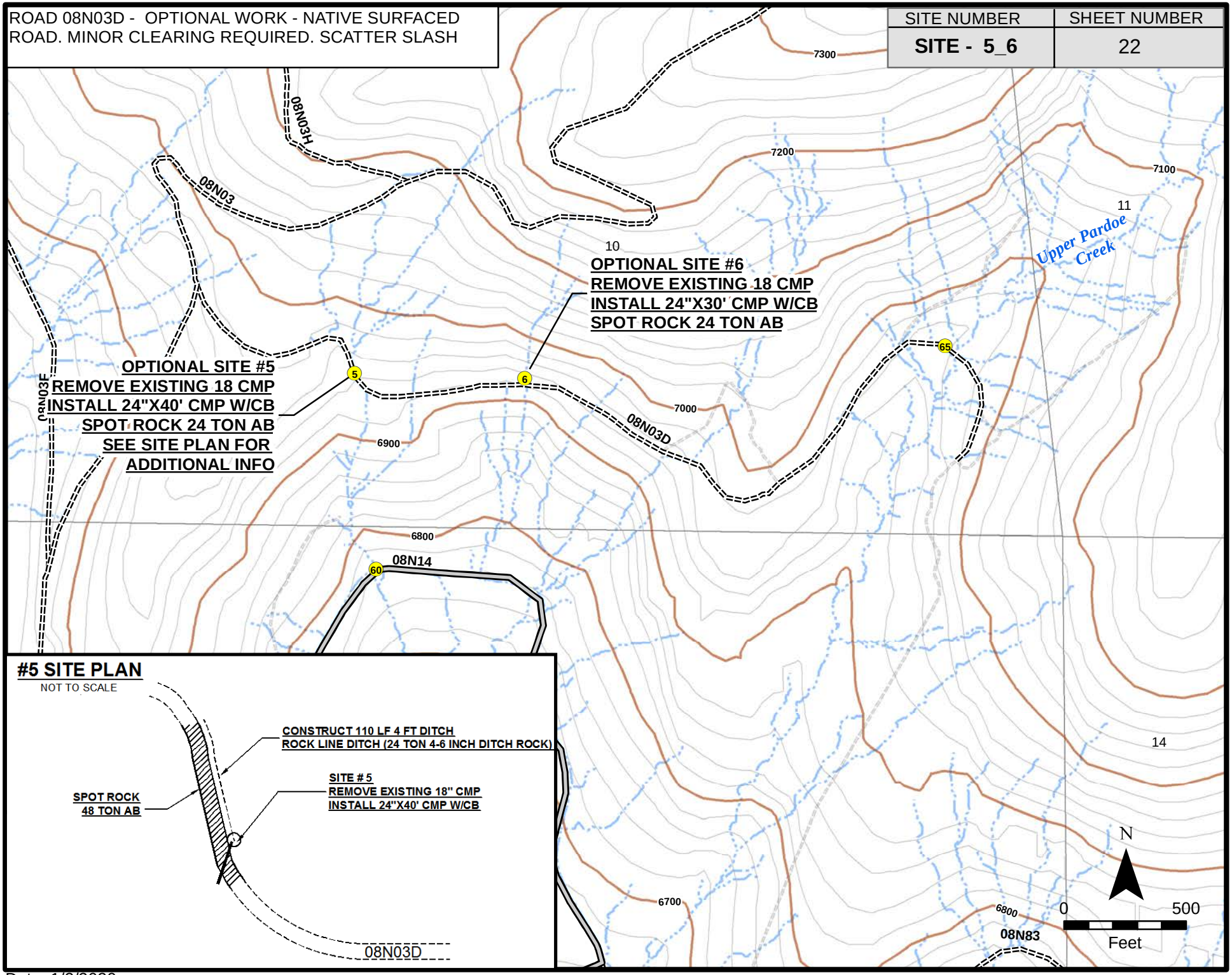


Date: 1/6/2020


ROAD NUMBER
SHEET NUMBER
OPTIONAL AREA MAP
21
61
27
66
20
1
104
19
5
6
18
9
3
Bear River Reservoir
Lower Bear River Reservoir
HWY 88
08N30
08N10
08N11
08N14
08N40
Bear River
Parade Creek
Cole Creek
Onion Valley Creek
Upper Parade Creek
Rattlesnake Creek
Pleasant Valley Creek
LEGEND
PROJECT CULVERTS
PRIORITY
OPTIONAL WORK
SYSTEM RDS
SURFACE_TYPE
AC
CHIP SEAL
AGG BASE
NATIVE
TRANS_SHED
OPEN
LIMITED ACCESS
LAND STATUS
OWNNERSHIP
Eldorado National Forest
PRIVATE
NF OUTSIDE BOUNDARY
STATE
N
0
1
Miles

ROAD 08N03D - OPTIONAL WORK - NATIVE SURFACED ROAD. MINOR CLEARING REQUIRED. SCATTER SLASH

SITE NUMBER	SHEET NUMBER
SITE - 5_6	22



#5 SITE PLAN

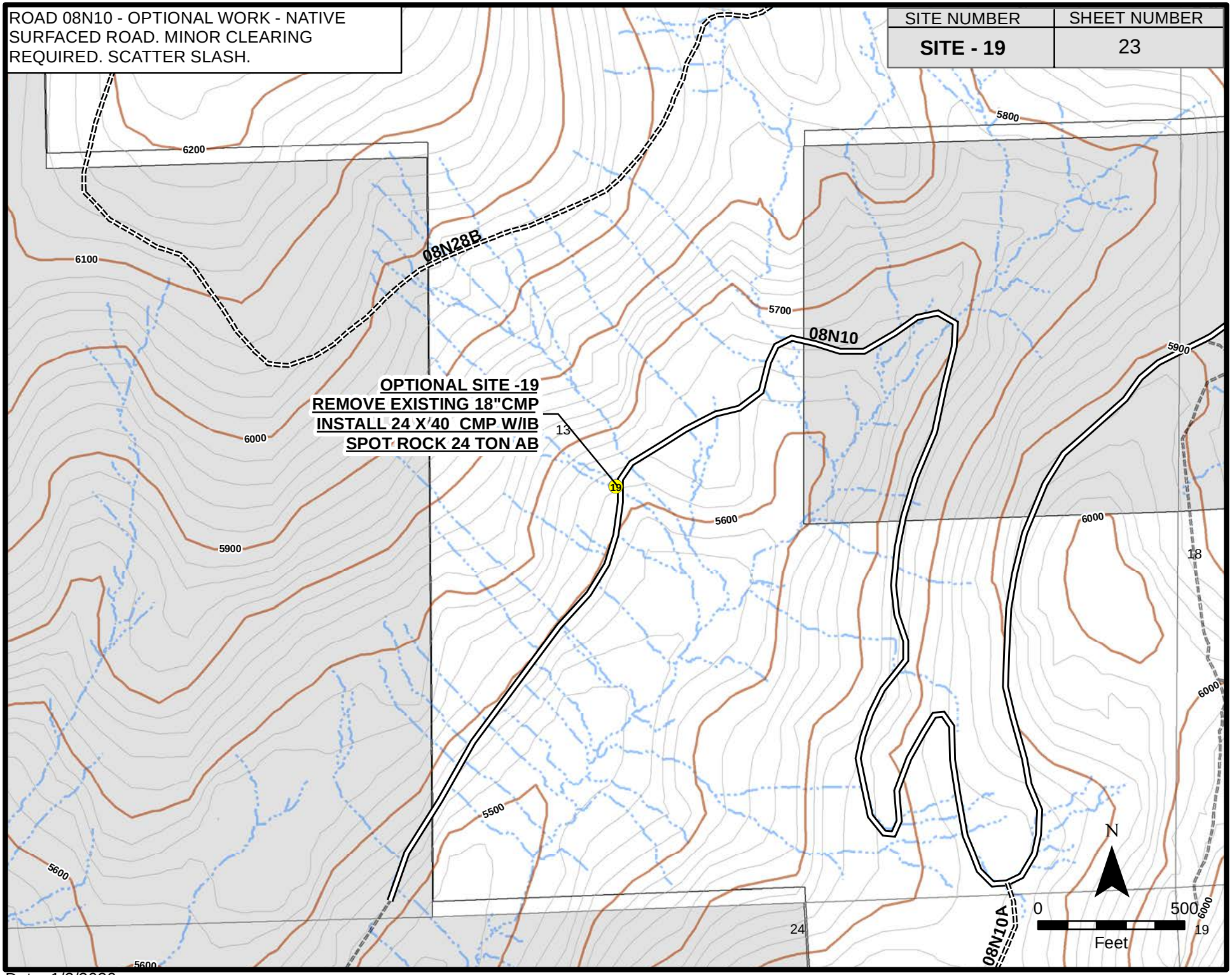
NOT TO SCALE

TE-5_6

Date: 1/2/2020

ROAD 08N10 - OPTIONAL WORK - NATIVE SURFACED ROAD. MINOR CLEARING REQUIRED. SCATTER SLASH.

SITE NUMBER	SHEET NUMBER
SITE - 19	23

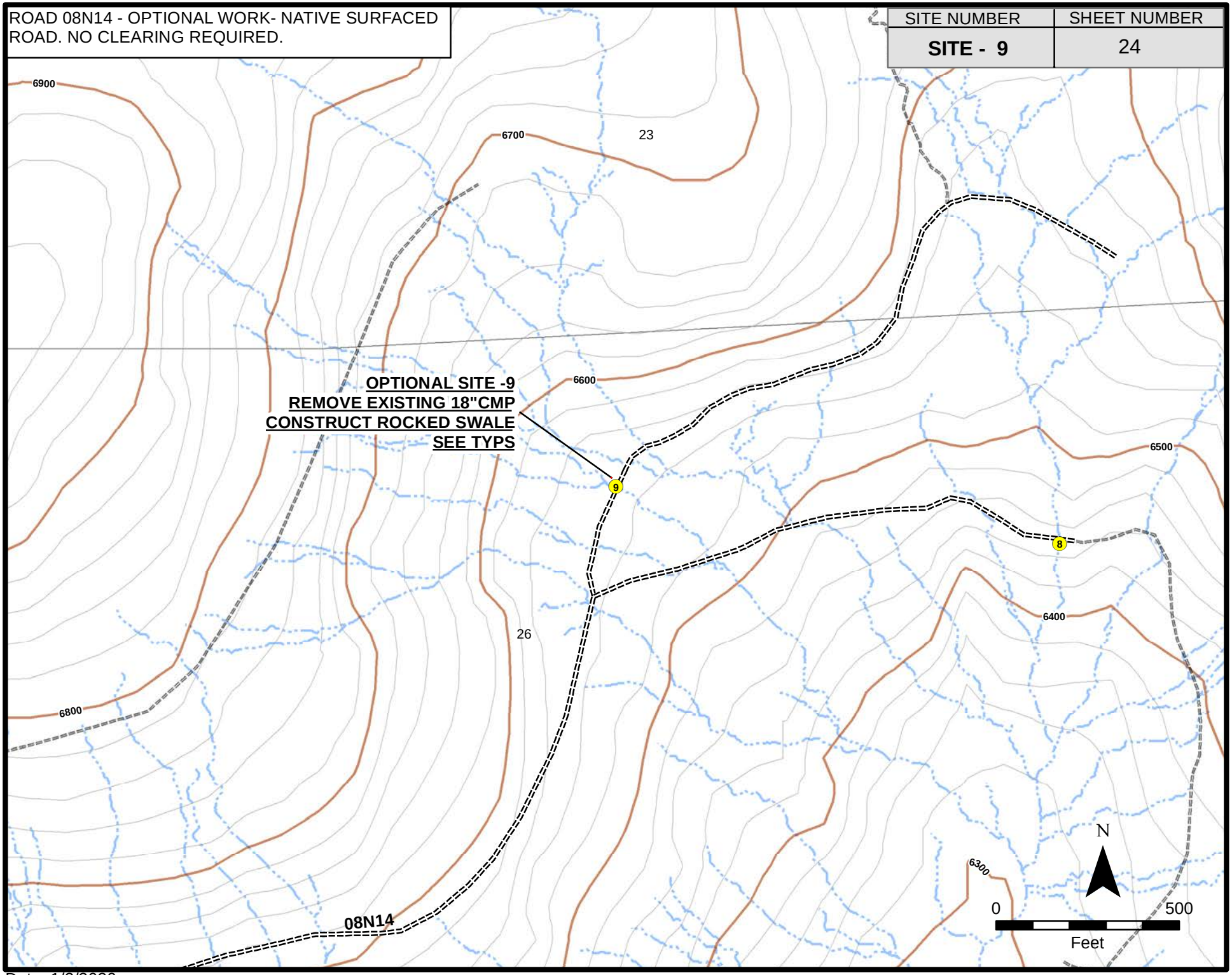


E-19

Date: 1/2/2020

ROAD 08N14 - OPTIONAL WORK- NATIVE SURFACED ROAD. NO CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE - 9	24



E-9

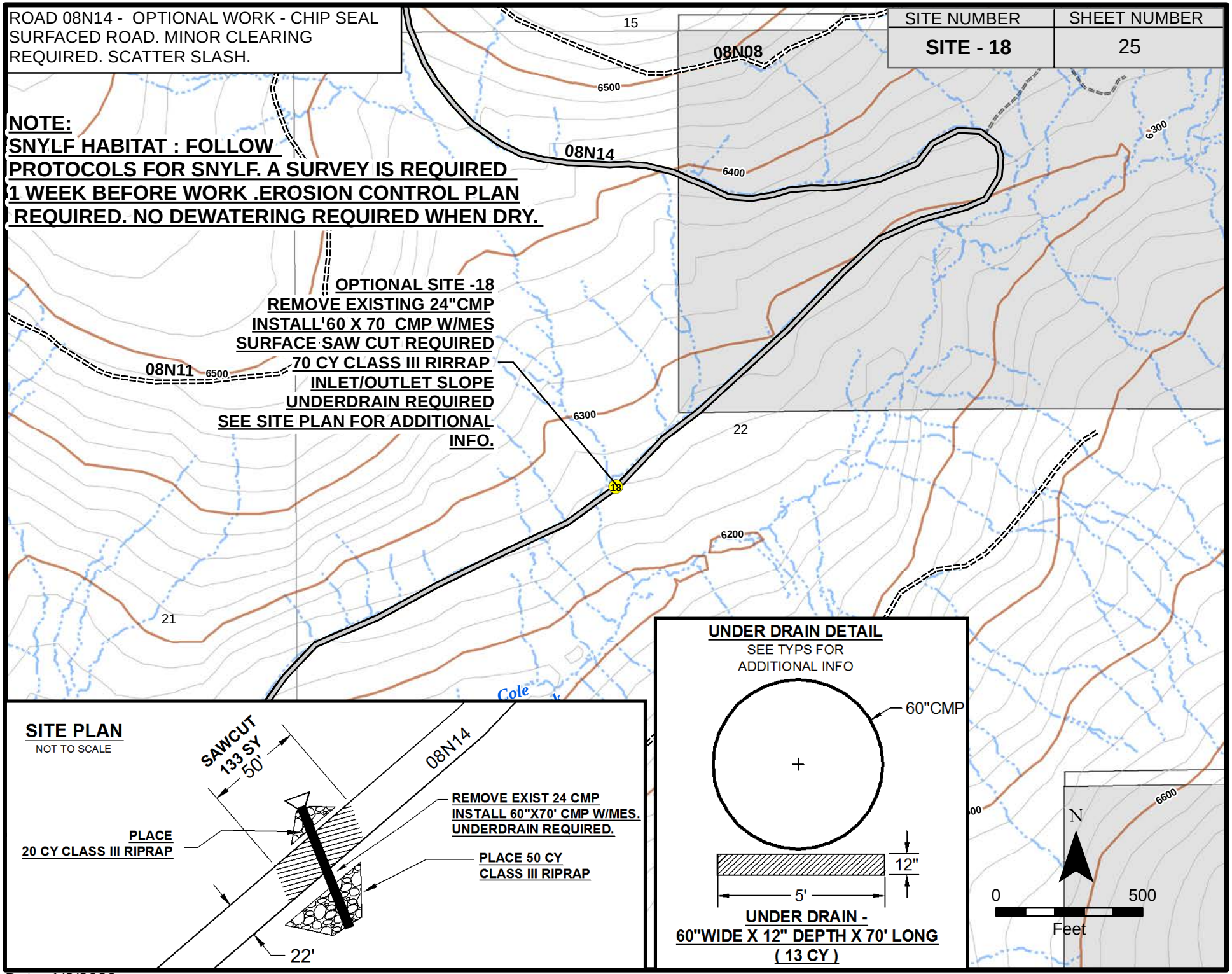
Date: 1/2/2020

ROAD 08N14 - OPTIONAL WORK - CHIP SEAL SURFACED ROAD. MINOR CLEARING REQUIRED. SCATTER SLASH.

SITE NUMBER	SHEET NUMBER
SITE - 18	25

NOTE:
SNYLF HABITAT : FOLLOW PROTOCOLS FOR SNYLF. A SURVEY IS REQUIRED 1 WEEK BEFORE WORK .EROSION CONTROL PLAN REQUIRED. NO DEWATERING REQUIRED WHEN DRY.

OPTIONAL SITE -18
REMOVE EXISTING 24"CMP
INSTALL 60 X 70 CMP W/MES
SURFACE SAW CUT REQUIRED
70 CY CLASS III RIRRAP
INLET/OUTLET SLOPE
UNDERDRAIN REQUIRED
SEE SITE PLAN FOR ADDITIONAL INFO.



SITE PLAN
NOT TO SCALE

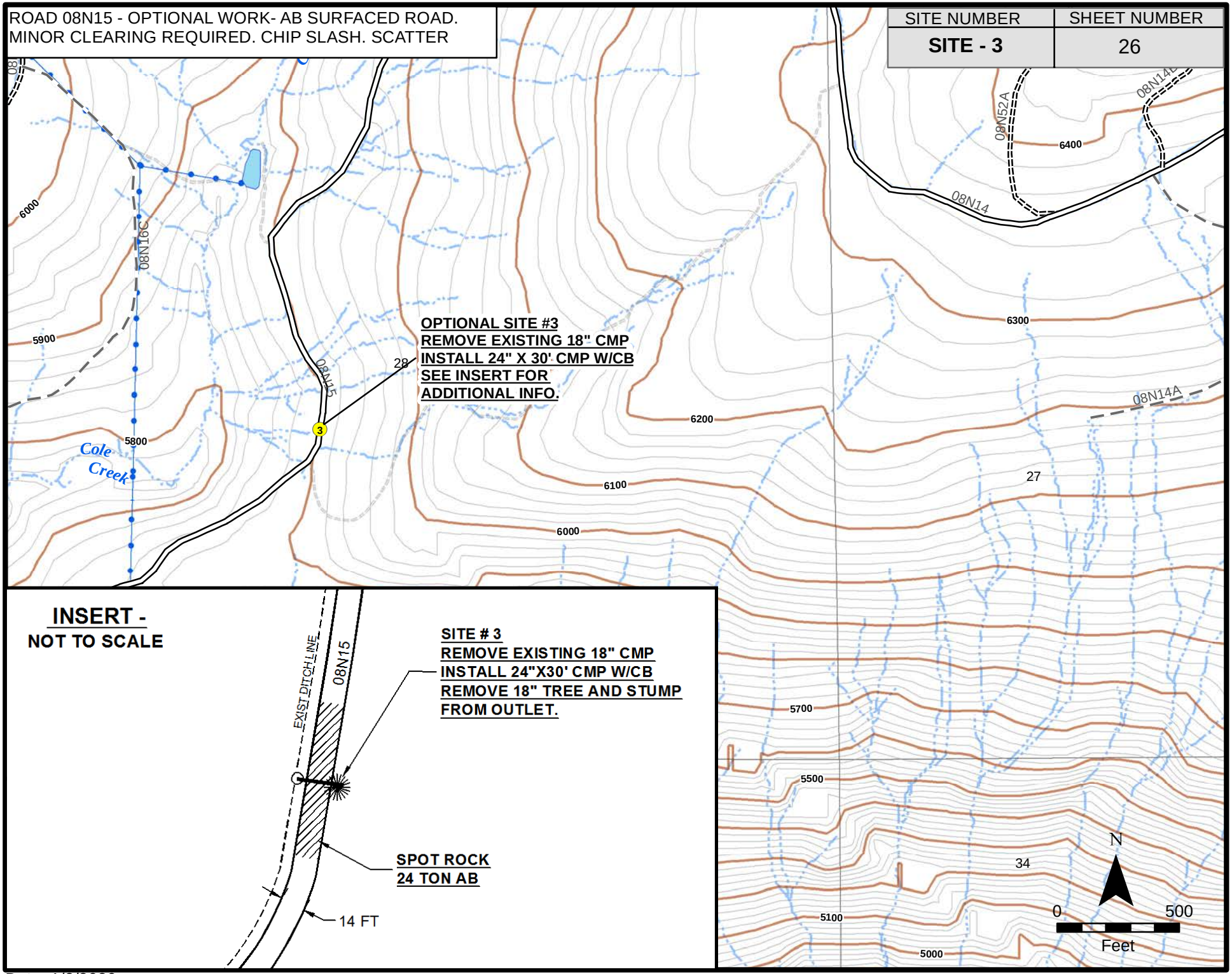
UNDER DRAIN DETAIL
SEE TYPS FOR ADDITIONAL INFO

UNDER DRAIN -
60"WIDE X 12" DEPTH X 70' LONG
(13 CY)

Date: 1/2/2020

ROAD 08N15 - OPTIONAL WORK- AB SURFACED ROAD.
MINOR CLEARING REQUIRED. CHIP SLASH. SCATTER

SITE NUMBER	SHEET NUMBER
SITE - 3	26



INSERT -
NOT TO SCALE

E-3

Date: 1/2/2020

ROAD 08N18B -OPTIONAL WORK - NATIVE SURFACE ROAD. MINOR CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE - 61	27

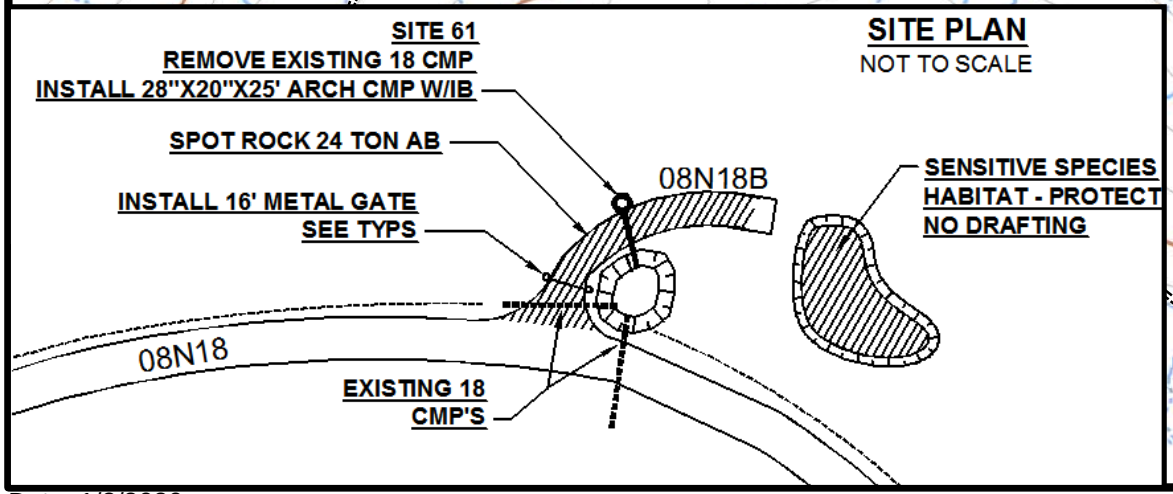
NOTE:
CRITICAL SNYLF HABITAT : FOLLOW PROTOCOLS FOR SNYLF. A SURVEY IS REQUIRED 1 WEEK BEFORE WORK AND REQUIRES AN ON-SITE MONITOR.
EROSION CONTROL PLAN REQUIRED. NO DEWATERING REQUIRED WHEN DRY.

OPTIONAL SITE -61
REMOVE EXISTING 18 CMP
INSTALL 28"X20"X25' ARCH CMP W/IB
SPOT ROCK 24 TONS AB
INSTALL METAL GATE
SEE SITE PLAN FOR ADDITIONAL INFO.

7000
6800
6700
6600
08N18
08N18B
61
06

TE-61

SITE PLAN
NOT TO SCALE



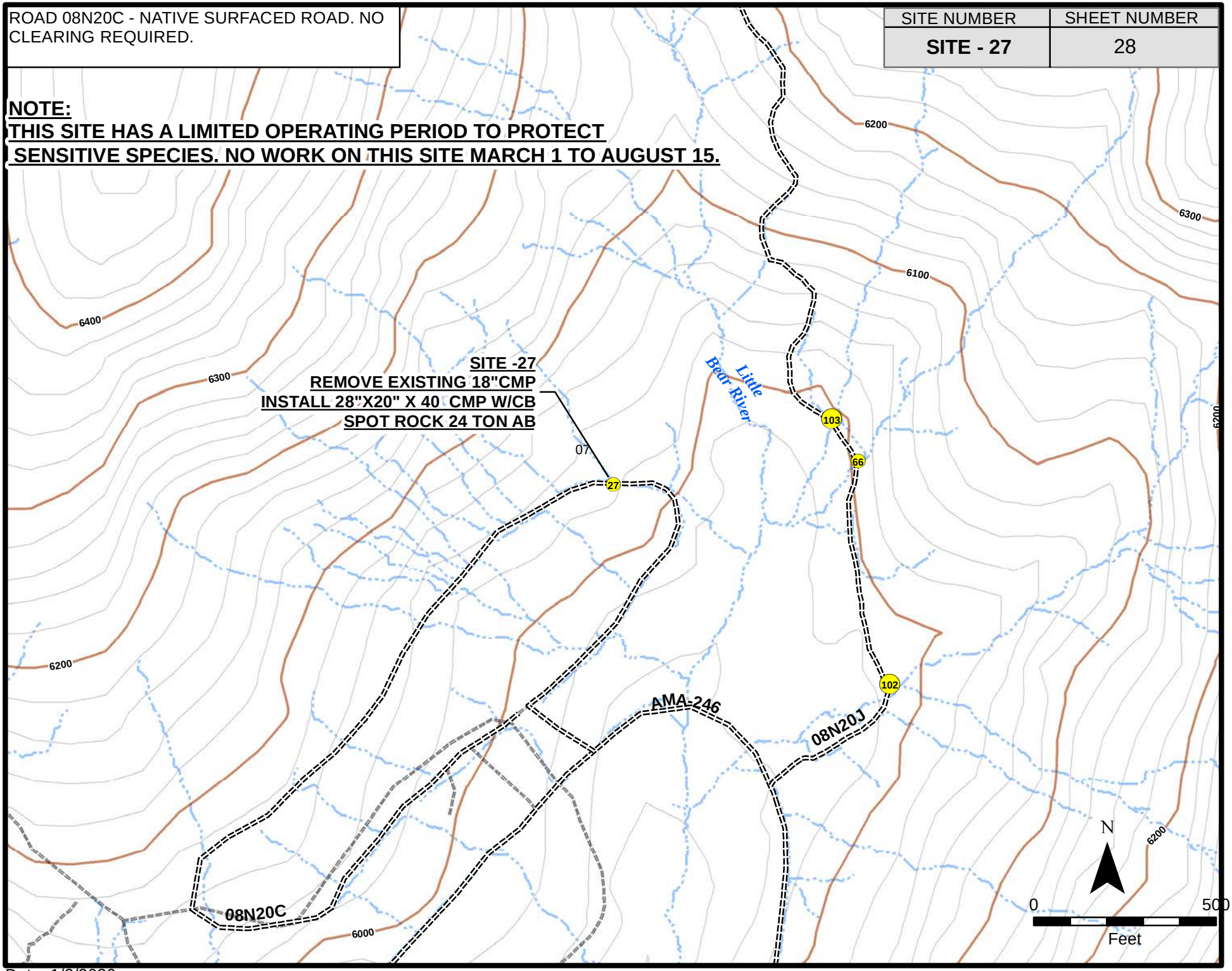
N
0
Feet
6500

Date: 1/2/2020

ROAD 08N20C - NATIVE SURFACED ROAD. NO CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE - 27	28

NOTE:
THIS SITE HAS A LIMITED OPERATING PERIOD TO PROTECT SENSITIVE SPECIES. NO WORK ON THIS SITE MARCH 1 TO AUGUST 15.

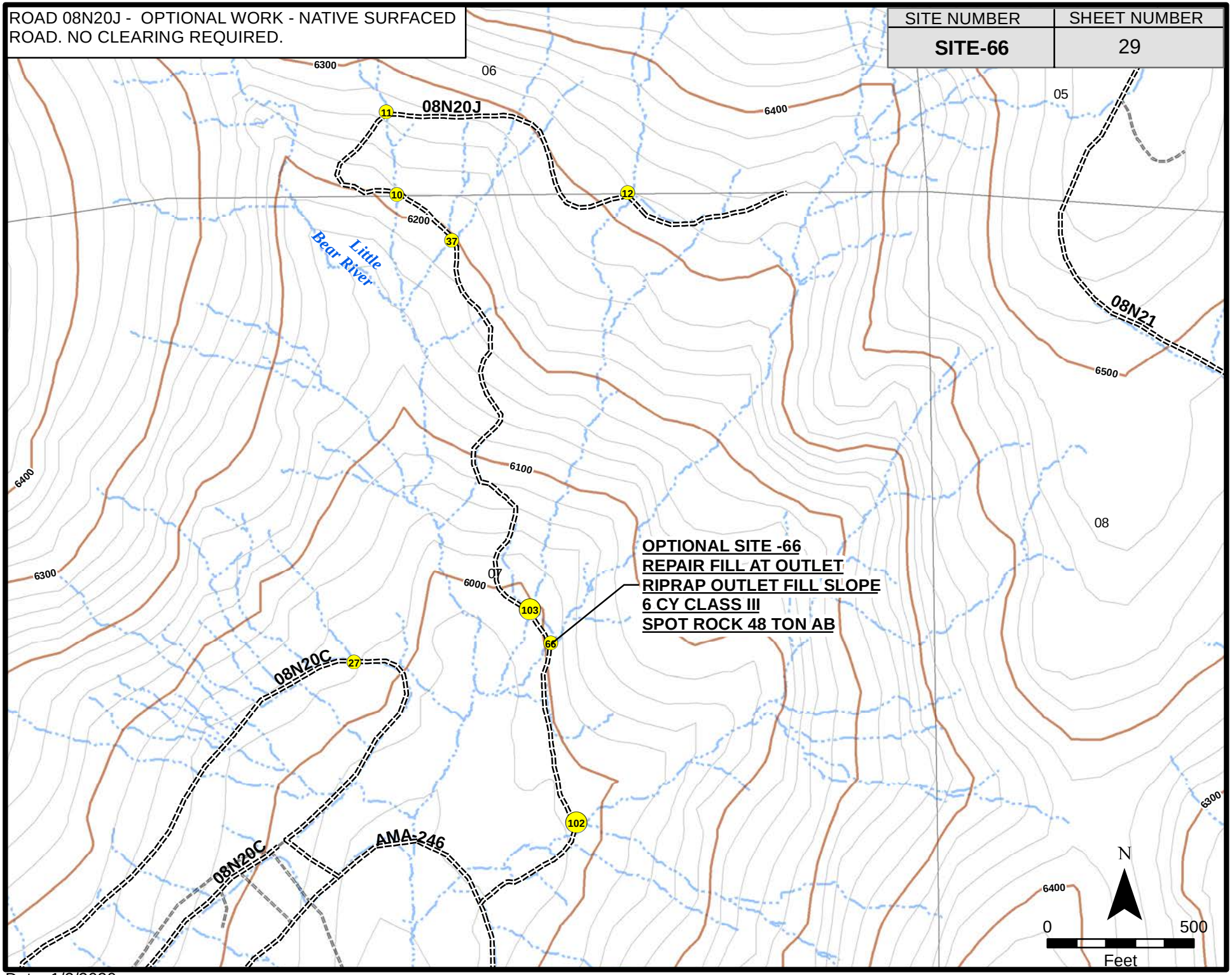


TE-27

Date: 1/2/2020

ROAD 08N20J - OPTIONAL WORK - NATIVE SURFACED ROAD. NO CLEARING REQUIRED.

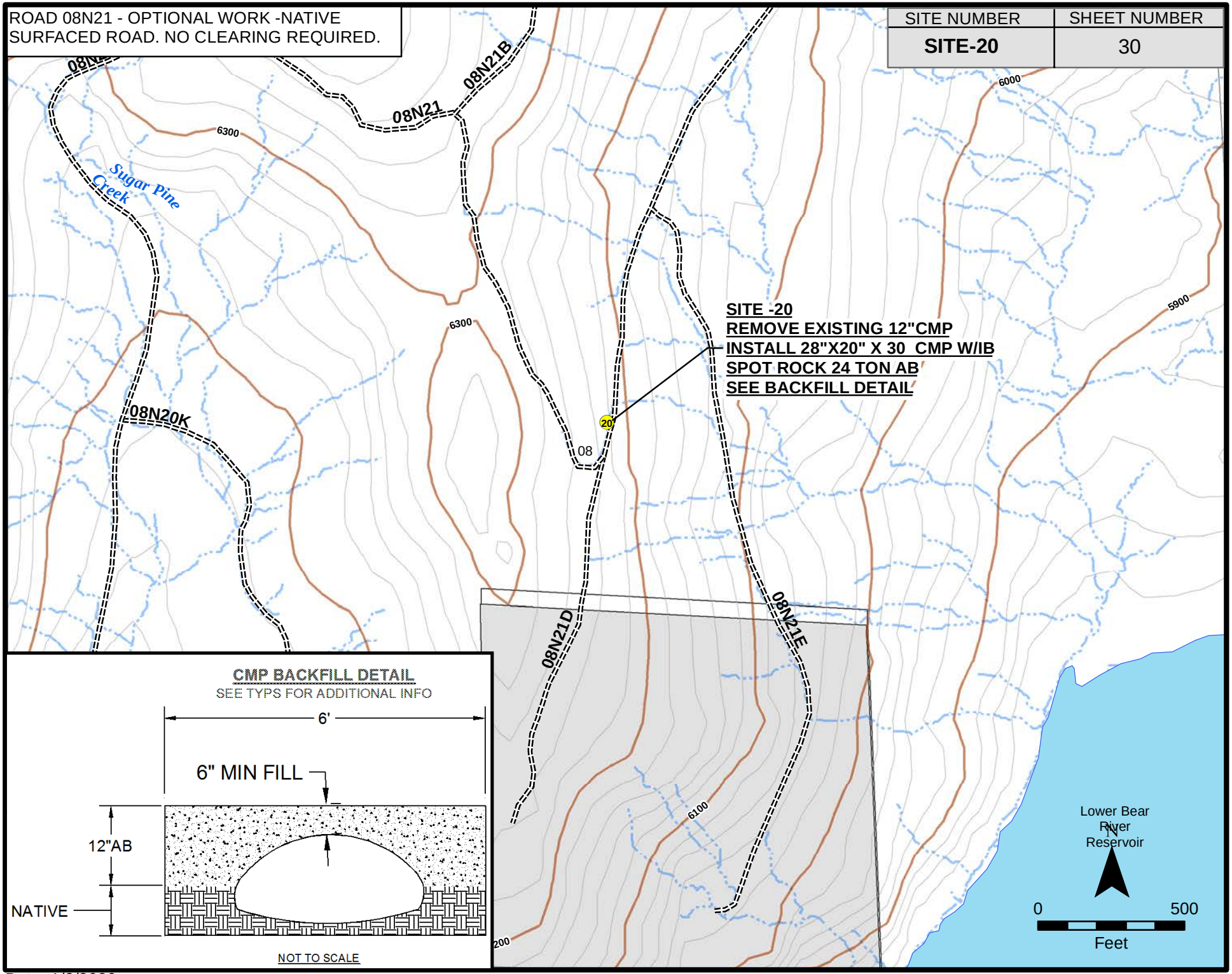
SITE NUMBER	SHEET NUMBER
SITE-66	29



Date: 1/2/2020

ROAD 08N21 - OPTIONAL WORK -NATIVE SURFACED ROAD. NO CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE-20	30



SITE -20
REMOVE EXISTING 12"CMP
INSTALL 28"X20" X 30 CMP W/IB
SPOT ROCK 24 TON AB
SEE BACKFILL DETAIL

CMP BACKFILL DETAIL
SEE TYPS FOR ADDITIONAL INFO

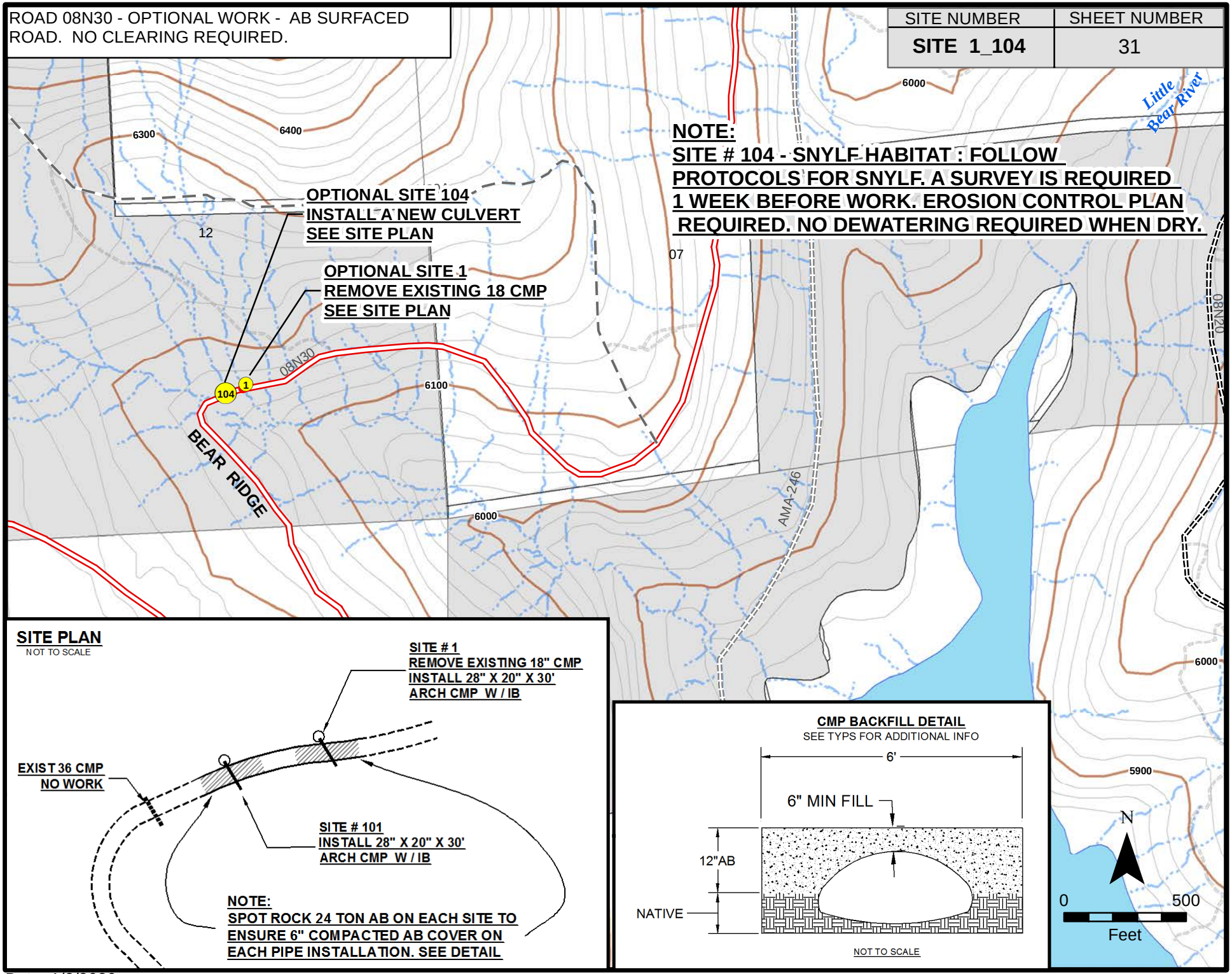
NOT TO SCALE

E-20

Date: 1/2/2020

ROAD 08N30 - OPTIONAL WORK - AB SURFACED ROAD. NO CLEARING REQUIRED.

SITE NUMBER	SHEET NUMBER
SITE 1_104	31



SITE PLAN
NOT TO SCALE

NOTE:
SPOT ROCK 24 TON AB ON EACH SITE TO ENSURE 6" COMPACTED AB COVER ON EACH PIPE INSTALLATION. SEE DETAIL

CMP BACKFILL DETAIL
SEE TYPS FOR ADDITIONAL INFO

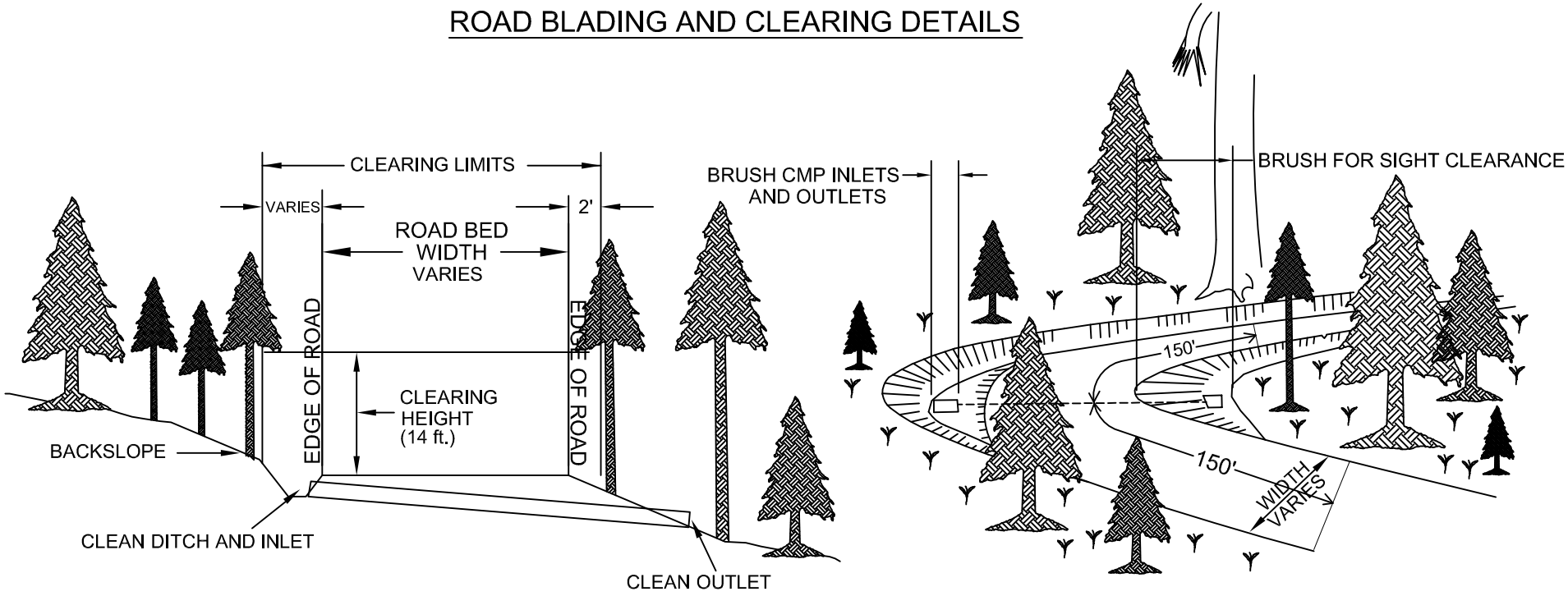
NOT TO SCALE

E-1_104

Date: 1/2/2020

PROJECT	SHEET NUMBER
BEAR	32

ROAD BLADING AND CLEARING DETAILS



CLEARING NOTES:

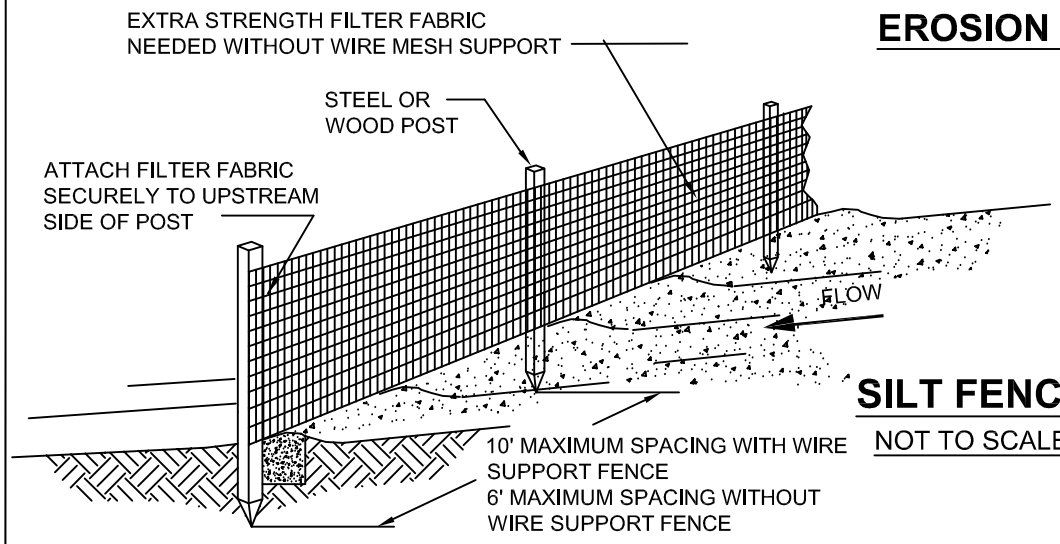
1. Clearing slash disposal methods shall be designated in the Schedule of Items or Shown On The Drawings.
2. Clear small trees (<10"dbh) and brush from all existing ditches, catch basins and inlet basins at each site
3. Clear small trees (<10"dbh) and brush above all CMP inlets for a distance of 10 linear feet either side of CMP. .
4. Side cast all chipped material onto fill slopes. Remove chipped material from all drainage inlets and ditches.

RECONDITIONING OF ROADWAY:

1. Typical road segment per site, unless shown otherwise in the Drawings, is 300 lf, or, 150 lf either side of the numbered site.
2. Work includes all work necessary to prepare site before and after culverts are installed , and prior to surface placements.
3. Outslope road bed 3% whenever possible. Remove all outside berms. When this is impractical relieve berm every 50 linear feet.
4. Clean and reshape all existing road ditches, leadoff ditches, dips associated with each site.
5. Drain all low points, ponds, swales.
6. Treat the full existing width of the road.

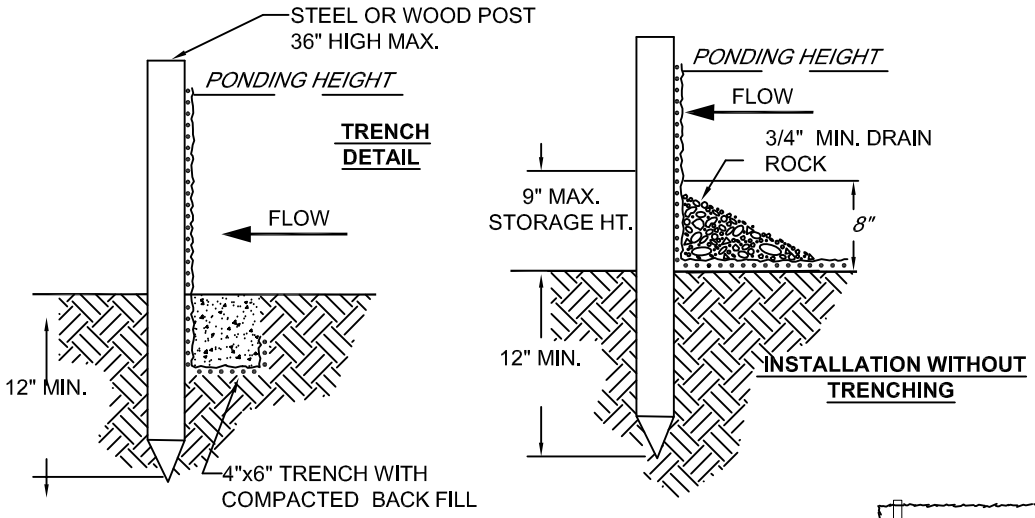
PROJECT	SHEET NUMBER
BEAR	33

EROSION CONTROL TYP



SILT FENCE

NOT TO SCALE



STRAW BALE BARRIER

NOT TO SCALE

NOTES:

1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.

2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING.

3. KEY IN BALES 4-INCHES TO PREVENT EROSION OR FLOW UNDER BALES.

4. USE CERTIFIED WEED FREE STRAW ONLY.

NOTES:

1. TEMPORARY EROSION CONTROL SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

2. INSPECT AND REPAIR TEMPORARY EROSION CONTROL AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" MAXIMUM RECOMMENDED STORAGE HEIGHT.

3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

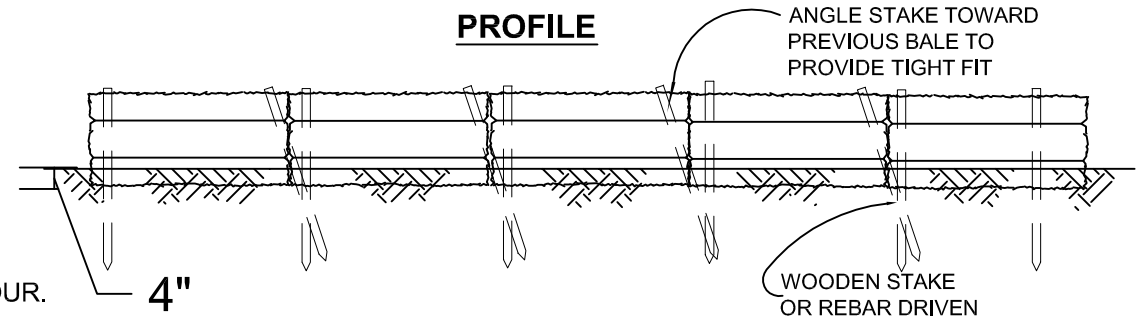
4. NO WORK SHALL BEGIN ON THIS CONTRACT UNTIL ALL NECESSARY POLLUTION CONTROL EQUIPMENT AND MATERIALS ARE ON SITE, AND IN PLACE.

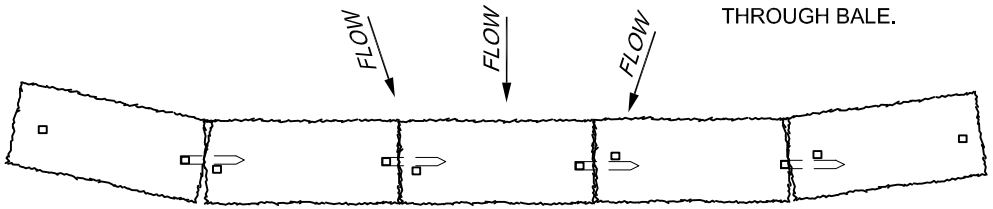
5. COIR LOGS **MAY NOT** BE SUBSTITUTED FOR EROSION SILT FENCING

6. STRAW BALE BARRIER REQUIRED FOR ALL SITES AFFECTING SIERRA NEVADA YELLOW LEGGED FROG ,"SNYLF", HABITAT.

7. UPON COMPLETION OF THE PROJECT, ALL TEMPORARY POLLUTION CONTROL MEASURES SHALL BE REMOVED AND THE SITE RESTORED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.

PROFILE



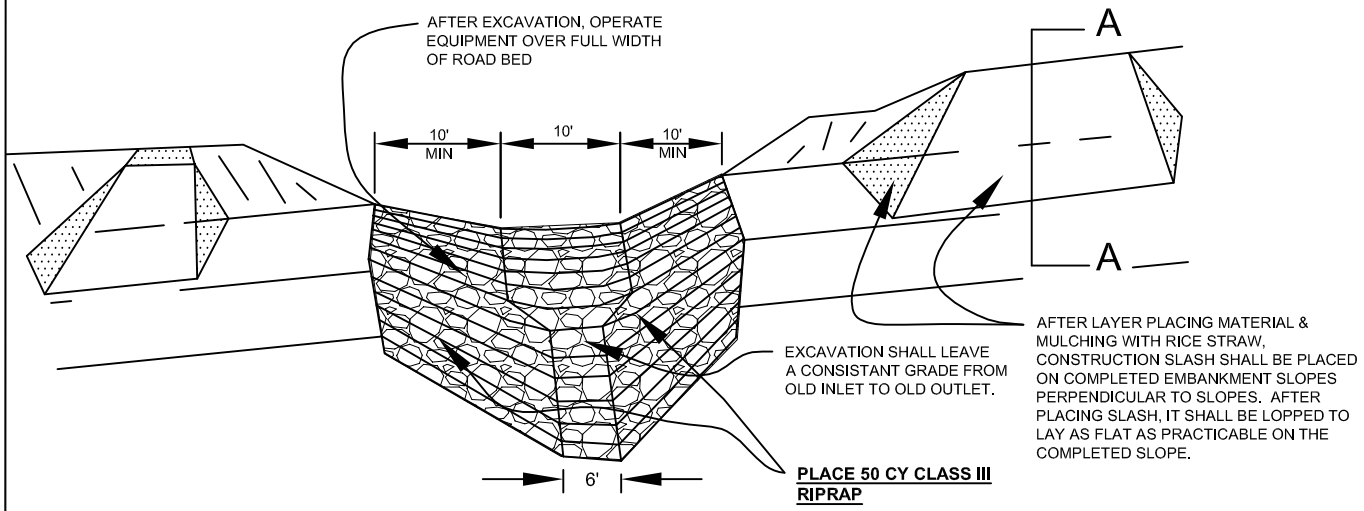


PLAN

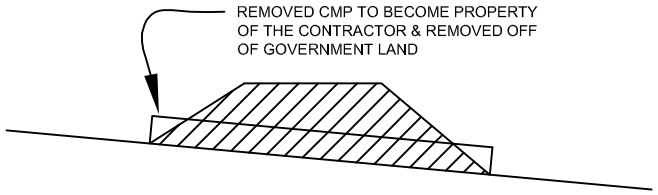
PROJECT	SHEET NUMBER
BEAR	34

DRAINAGE RESTORATION

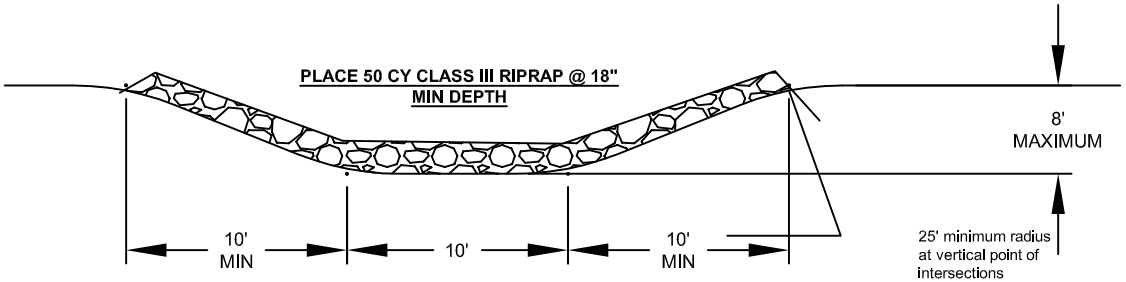
NO SCALE



PERSPECTIVE VIEW



CROSS SECTION OF EXCAVATION



ELEVATION

GENERAL NOTES:

1. THE INTENT OF CULVERT REMOVAL IS TO RESTORE NATURAL DRAINAGE FUNCTION.

2. CROSSING SITE TO BE BLOCKED AND BARRICADED TO PREVENT FURTHER ACCESS.

3. AFTER THE CMP IS REMOVED THE CROSSING WILL BE A MINIMUM OF 12' WIDE, OUTSLOPED 5% TO 7% AT THE UPPER END OF THE CHANNEL.

4. THE CHANNEL DOWNSLOPE OF THE NEW CROSSING WILL BE 6' WIDE WITH SIDE SLOPES TO BLEND INTO SLOPES FOR THE CROSSING. OUTSLOPE WILL BE TO MATCH THE EXISTING CHANNEL.

5. NO SIDE CASTING OF MATERIAL IS PERMITTED.

6. NO OVER EXCAVATION IS PERMITTED.

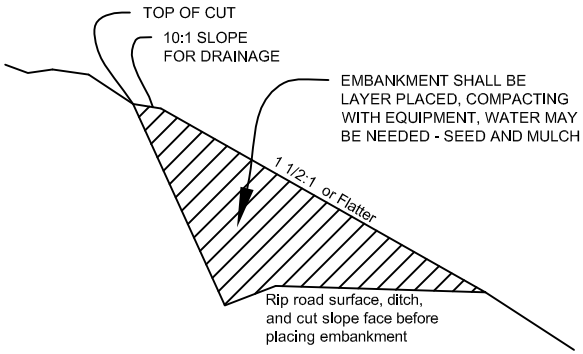
7. THE LOCATION FOR THE EXCAVATED MATERIAL WILL BE LAYER PLACED IN A LOCATION AS SHOWN ON THE DRAWINGS. WATER MAY BE NEEDED.

8. ALL EXCAVATED SLOPES AND PLACED EMBANKMENT WILL BE MULCHED WITH RICE STRAW AND CONSTRUCTION SLASH. CONSTRUCTION SLASH SHALL BE PLACED TO REDUCE SOIL EROSION.

9. CONSTRUCTION ACTIVITIES SHALL BE CONFINED TO THE EXISTING ROAD BED, CMP LOCATION & DESIGNATED WASTE SITES, OR AT AREAS AS APPROVED BY THE ENGINEER.

10. PAYMENT INCLUDES ALL WORK NECESSARY TO EXCAVATE AND SHAPE NEW CHANNEL.. cULVERT REMOVAL / DISPOSAL AND RIPRAP PAID SEPARATELY.

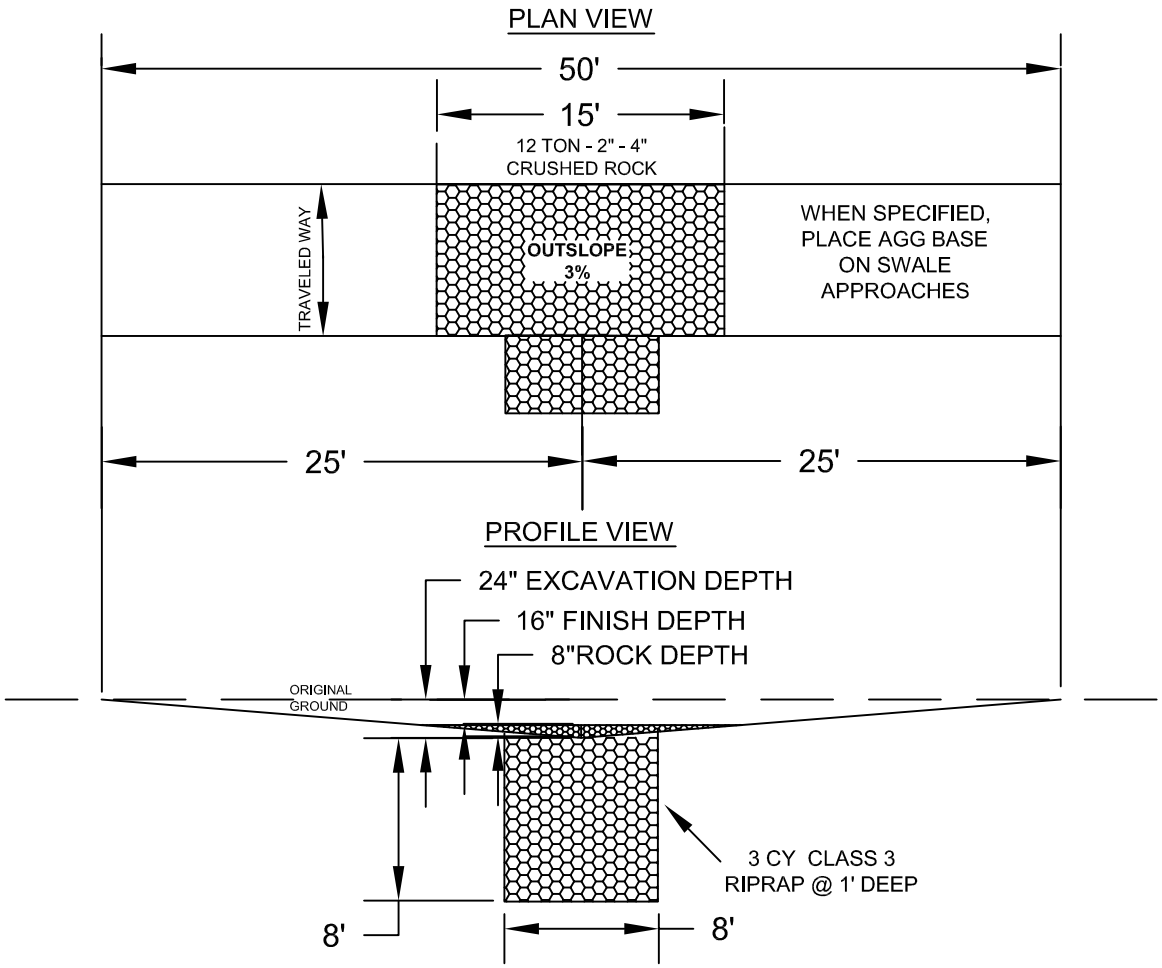
EMBANKMENT CROSS SECTION 'A' - 'A'



PROJECT	SHEET NUMBER
BEAR	35

ROCKED SWALE TYP

NOT TO SCALE



NOTE: CONSTRUCTION OF A ROCKED SWALE INCLUDES:

ALL LABOR AND EQUIPMENT NECESSARY TO GRADE AND SHAPE SWALE.

THE PLACEMENT OF 12 TON CRUSHED ROCK AND 3 CY CLASS III RIP RAP.

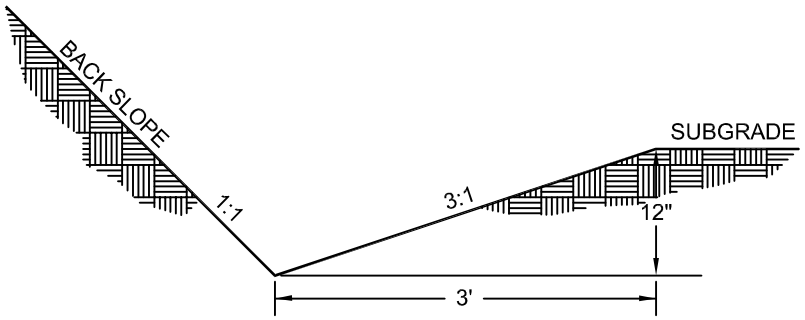
CRUSHED ROCK IS A COMMERCIAL SOURCE.

CLASS III RIPRAP MAY BE COMMERCIAL OR LOCAL SOURCE.

ADDITIONAL ROCK OR AGG BASE, IF REQUIRED, SHALL BE PAID SEPARATELY.

PROJECT	SHEET NUMBER
BEAR	36

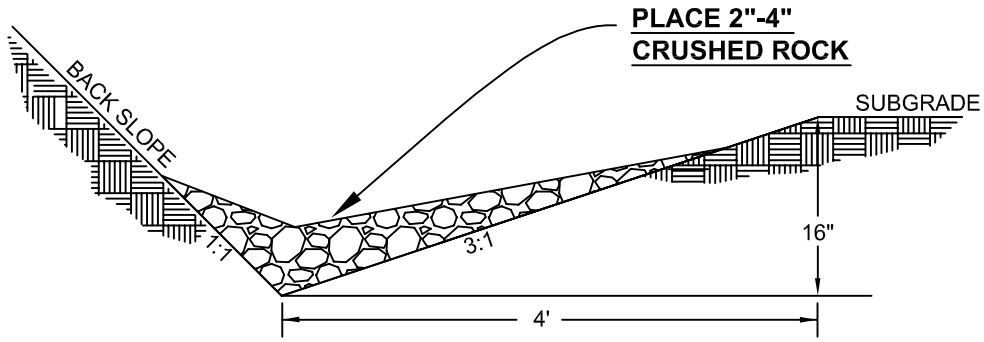
ROADWAY DITCH TYP 3' DITCH



GENERAL NOTES:

1. WHEN POSSIBLE, UTILIZE SUITABLE EXCAVATED MATERIAL IN ROADBED.

ROCKED ROADWAY DITCH TYP 4' DITCH

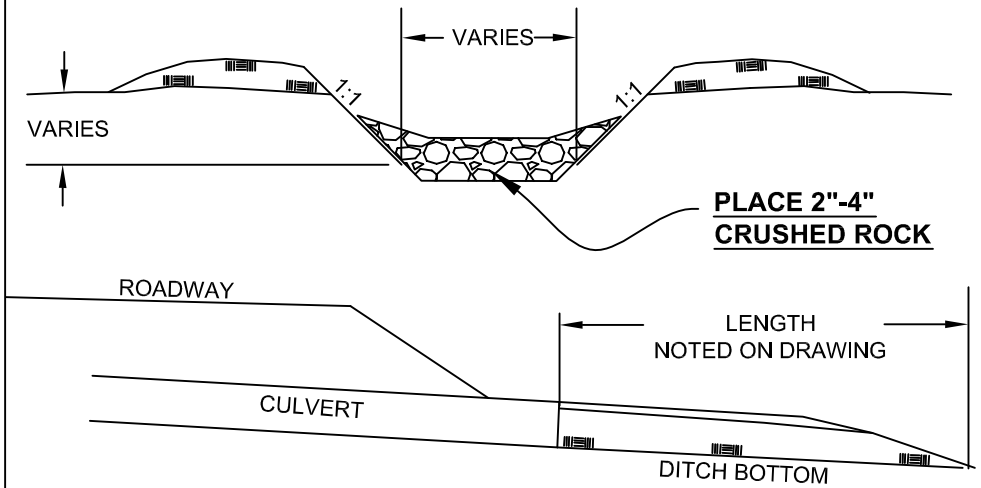


GENERAL NOTES:

1. WHEN POSSIBLE, UTILIZE SUITABLE EXCAVATED MATERIAL IN ROADBED.

ROCKED LEAD OFF DITCH

1. LEAD OFF DITCH BOTTOM SHALL BE SLOPED TO PROVIDE PROPER DRAINAGE.

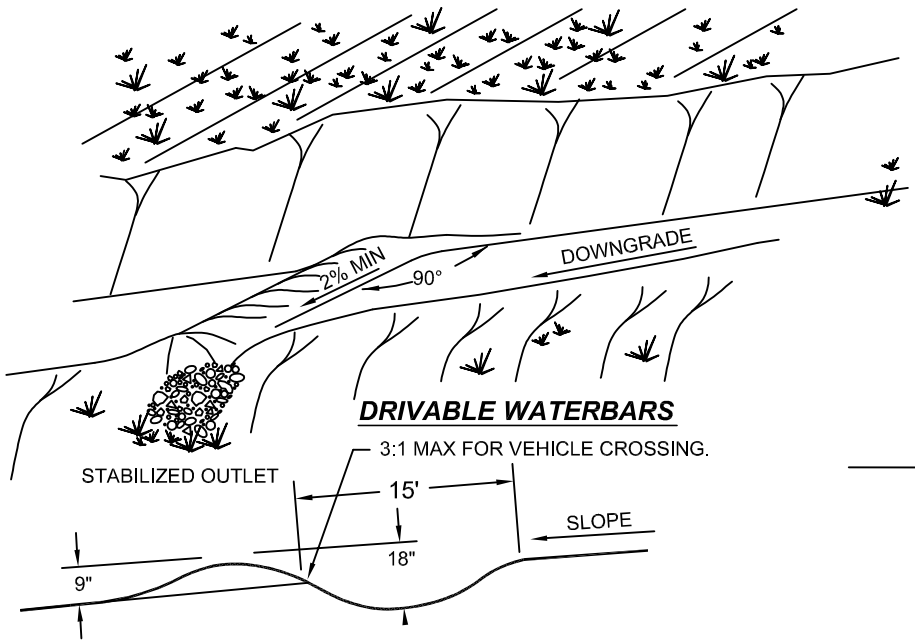


Lead-Off Ditches are considered incidental to other Pay Items and will not be measured of paid for seperately.

PROJECT	SHEET NUMBER
BEAR	37

WATERBAR

FOR HIGH CLEARANCE VEHICLES



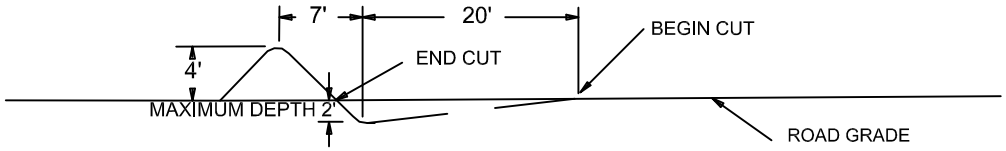
NOTES: WATERBARS

1. ALL WATER BARS SHALL BEGIN AT THE INTERSECTION OF THE ROAD BED WITH THE BACK SLOPE AND RUN ACROSS THE ENTIRE WIDTH OF THE ROAD BED.

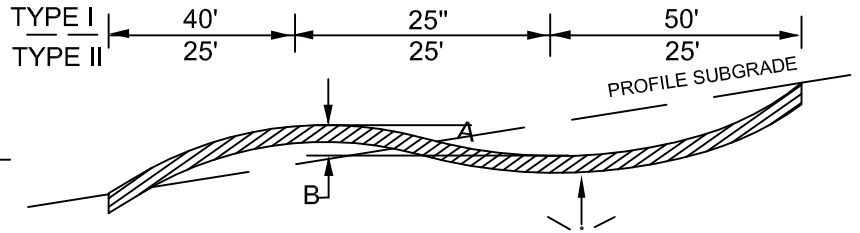
2. ALL WATER BARS SHALL HAVE FREE FLOWING OUTLETS. CONSTRUCTION OF LEAD-OFF DITCHES ARE INCIDENTAL TO WATER BAR CONSTRUCTION

3. WHEEL ROLL AND COMPACT ALL DRIVABLE WATERBARS. REMOVE ROCKS AND OTHER OBSTRUCTIONS FROM FINISHED WATERBARS.

NON - DRIVABLE WATERBARS



ROLLING DIP DETAIL
TYPE I & II

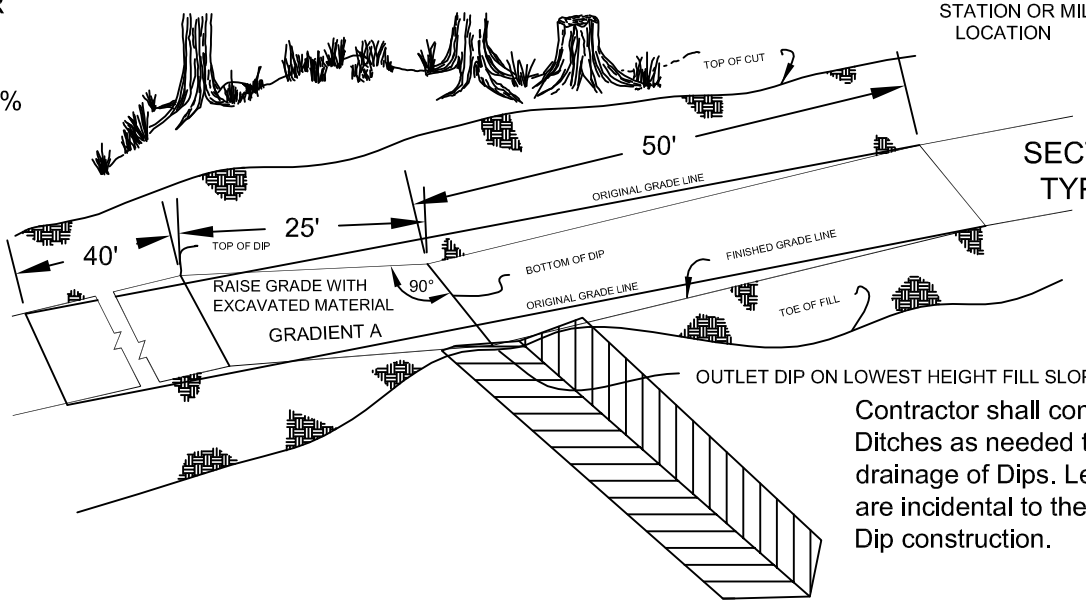


NOTES:

1. THE DESIGN VEHICLE OR CRITICAL VEHICLE FOR THIS DIP DESIGN IS A MODEL 62 FIRE ENGINE.

2. ENTIRE LENGTH OF DIP SHALL BE OUTSLOPED 3% TO 5%.

3. ROLLING DIP STATIONS ARE APPROXIMATE. LOCATIONS OF THE DIPS SHALL BE STAKED ON THE GROUND BEFORE CONSTRUCTION.



SECTION
TYPE 1

ORIGINAL ROAD GRADIENT	GRADIENT A
0 %-8 %	+3-5 %
9 %-12 %	+2-3 %

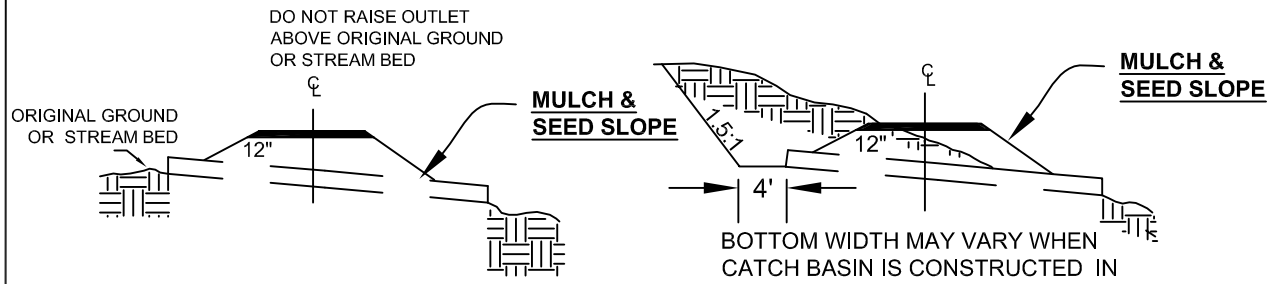
Contractor shall construct Lead Off Ditches as needed to ensure proper drainage of Dips. Lead-Off Ditches are incidental to the construction of Dip construction.

PROJECT	SHEET NUMBER
BEAR	38

DRAINAGE CONSTRUCTION DETAILS

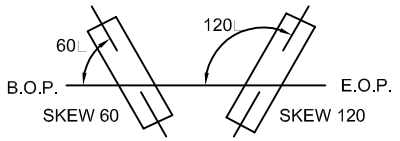
NOTE:

SEED AND MULCH INCIDENTAL TO CULVERT INSTALLATION.



BOTTOM WIDTH MAY VARY WHEN CATCH BASIN IS CONSTRUCTED IN NATURAL DRAINAGE OR WHEN MES REQUIRED.

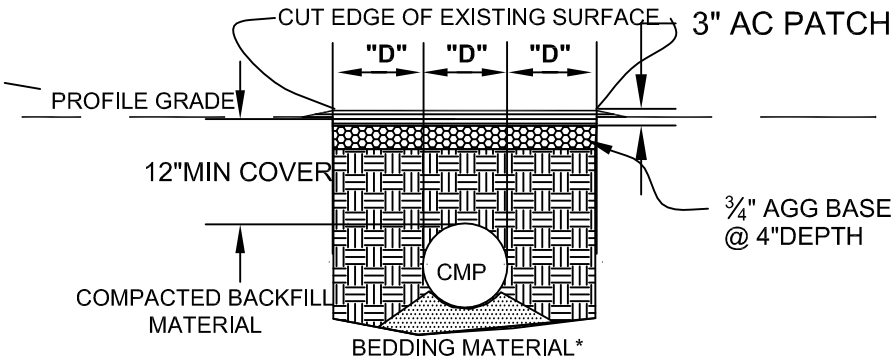
SKEW DIAGRAM



NOTE: SKEW ANGLE WILL BE SHOWN ON THE PLANS.

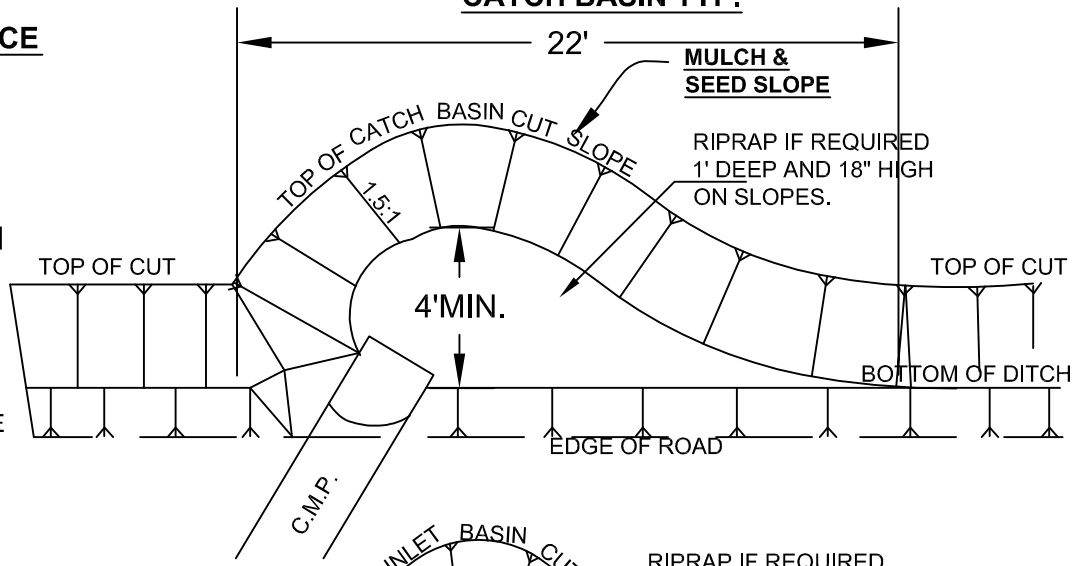
METHOD OF BACKFILLING PIPE ON AC / CHIP SEAL SURFACE TYP.

NOTE:
MINIMUM COVER OVER CULVERT AT SHOULDER SHALL BE 12 INCHES BELOW SUBGRADE FOR SURFACED AND 18 INCHES BELOW SUBGRADE FOR UNSURFACED UNLESS SHOWN OTHERWISE IN DRAWINGS.

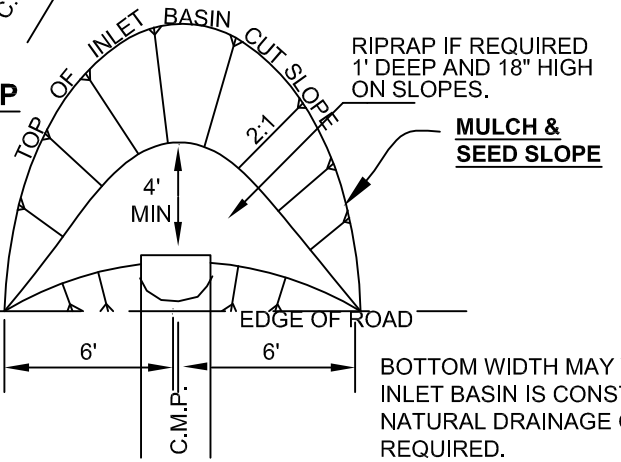


***-SEE SITE DESIGNS FOR ADDITIONAL INFO WHEN UNDERDRAIN IS REQUIRED**

CATCH BASIN TYP.

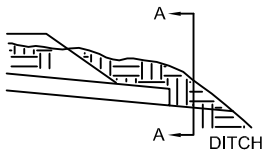


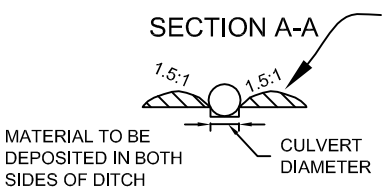
INLET BASIN TYP



BOTTOM WIDTH MAY VARY WHEN INLET BASIN IS CONSTRUCTED IN NATURAL DRAINAGE OR WHEN MES REQUIRED.

OUTLET DITCH TYP





FILL HEIGHT & INCH (mm) SHEET THICKNESS TABLES

THE METRIC CONVERSIONS ARE PROVIDED IN PARENTHESIS FOLLOWING THE ENGLISH UNITS.

H-20 LIVE LOAD

PROJECT	SHEET NUMBER
BEAR	39

ROUND PIPES

2 2/3" x 1/2" (68 mm x 13 mm) CORRUGATIONS

PIPE DIA.	MIN. COVER	STEEL					ALUMINUM						
		MAXIMUM FILL HEIGHTS ABOVE TOP OF PIPE IN FEET (meter)											
		METAL THICKNESS IN INCHES (mm)											
		RIVETED, HELICAL OR SPOT WELDED					RIVETED OR HELICAL FABRICATION					SPOT WELDED FAB.	
INCHES (mm)		.064 (1.6)	.079 (2.00)	.109 (2.8)	.138 (3.5)	.168 (4.26)	.060 (1.5)	.075 (1.9)	.105 (2.67)	.135 (3.4)	.164 (4.0)	.060 (1.5)	.075 (1.9)
12 (305)	12 (305)	84 (25.6)	91 (27.7)				45 (13.7)	45 (13.7)	78 (23.8)	81 (25.6)	84 (25.4)	26 (7.9)	33 (10.0)
15 (381)	12 (305)	67 (20.4)	73 (22.2)										
18 (457)	12 (305)	56 (17.0)	61 (18.6)				30 (9.1)	30 (9.1)	52 (15.8)	54 (16.5)	56 (17.0)	18 (5.5)	22 (6.7)
24 (610)	12 (305)	42 (12.8)	46 (14.0)	59 (18)			22 (6.7)	22 (6.7)	39 (11.9)	41 (12.5)	42 (12.8)	14 (4.3)	16 (4.9)
30 (762)	12 (305)	34 (10.4)	36 (11.0)	47 (14)			18 (5.5)	18 (5.5)	31 (9.4)	32 (9.8)	34 (10.4)	11 (3.4)	13 (4.0)
36 (914)	12 (305)	28 (8.5)	30 (9.1)	39 (11.9)	41 (12.5)		15 (4.6)	15 (4.6)	26 (7.9)	27 (8.2)	28 (8.5)	9 (2.7)	11 (3.3)
42 (1067)	12 (305)	31 (9.4)	43 (13.1)	46[67] (14.0)	48[70] (14.6)	50[73] (15.2)		26 (7.9)	43 (13.1)	43 (13.1)	44 (13.4)		
48 (1219)	12 (305)	27 (8.2)	37 (11.3)	45[58] (13.7)	46[61] (14.0)	47[64] (14.3)			40 (12.2)	41 (12.5)	43 (13.1)		
54 (1372)	12 (305)		33 (10.0)	43[52] (13.1)	44[54] (13.4)	45[57] (13.7)			35 (10.7)	37 (11.3)	38 (11.6)		
60 (1524)	12 (305)			43[47] (13.1)	43[49] (13.1)	44[51] (13.4)				33 (10.0)	34 (10.4)		
66 (1676)	12 (305)			42 (12.8)	43 (13.1)	43[47] (13.1)				30 (9.1)	31 (9.4)		
72 (1829)	12 (305)				41 (12.8)	43 (13.1)					29 (8.8)		
78 (1981)	12 (305)					39 (11.9)							
84 (2134)	12 (305)					35 (10.7)							

3" X 1" (76 mm x 25 mm) CORRUGATIONS

PIPE DIAMETER	MINIMUM COVER	STEEL				
		MAXIMUM FILL HEIGHTS ABOVE TOP OF PIPE IN FEET (meter)				
		METAL THICKNESS IN INCHES (mm)				
INCHES (mm)		.064 (1.6)	.079 (2.00)	.109 (2.76)	.138 (3.5)	.168 (4.26)
36 (914)	12 (305)	48 (14.6)	60 (18.3)	78[88] (23.8)	89[106] (27)	101[118] (30.8)
42 (1067)	12 (305)	41 (12.5)	51 (15.6)	64[76] (19.5)	71[91] (21.6)	79[101] (24.0)
48 (1219)	12 (305)	36 (11.0)	45 (13.7)	57[66] (17.4)	61[80] (18.6)	66[88] (20.1)
54 (1372)	12 (305)	32 (9.75)	40 (12.2)	52[59] (15.8)	55[71] (16.7)	59[79] (18.0)
60 (1524)	12 (305)	29 (8.8)	36 (11.0)	49[53] (14.9)	51[64] (15.9)	54[71] (16.4)
66 (1676)	12 (305)	26 (7.9)	33 (10.0)	47 (14.3)	49[58] (14.9)	51[64] (15.5)
72 (1829)	12 (305)	24 (7.3)	30 (9.1)	44 (13.4)	47[53] (14.3)	49[59] (14.9)
78 (1981)	12 (305)	22 (6.7)	28 (8.5)	41 (12.5)	46[49] (14.0)	47[54] (14.3)
84 (2134)	12 (305)	21 (6.4)	26 (7.9)	38 (11.6)	45 (13.7)	46[51] (14.0)
90 (2286)	12 (305)	19 (5.8)	24 (7.3)	35 (10.7)	43 (13.1)	45 (13.7)
96 (2438)	12 (305)	18 (5.5)	22 (6.7)	33 (10.0)	40 (12.2)	44 (13.4)
102 (2591)	24 (610)	17 (5.2)	21 (6.4)	31 (9.4)	38 (11.6)	42 (12.8)
108 (2743)	24 (610)		20 (6.0)	30 (9.1)	35 (10.7)	39 (11.9)
114 (2896)	24 (610)		19 (5.8)	28 (8.5)	34 (10.4)	37 (11.3)
120 (3048)	24 (610)			27 (8.2)	32 (9.7)	36 (11.0)

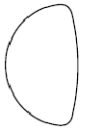
6" X 1" (152 mm x 25 mm) CORRUGATIONS

PIPE DIAMETER	MINIMUM COVER	ALUMINUM				
		MAXIMUM FILL HEIGHTS ABOVE TOP OF PIPE IN FEET (meter)				
		METAL THICKNESS IN INCHES (mm)				
INCHES (mm)		.060 (1.5)	.075 (1.9)	.105 (2.67)	.135 (3.4)	.165 (4.0)
30 (762)	15 (381)	29 (8.8)	37 (11.3)	56 (17.0)	58 (17.7)	59 (18.0)
36 (914)	15 (381)	24 (7.3)	31 (9.4)	47 (14.3)	48 (14.6)	49 (14.9)
42 (1067)	15 (381)	21 (6.4)	27 (8.2)	40 (12.2)	41 (12.5)	42 (12.8)
48 (1219)	15 (381)	24 (7.3)	28 (8.5)	37 (11.3)	44 (13.4)	49 (14.9)
54 (1371)	24 (610)	22 (6.7)	25 (7.6)	33 (10.1)	39 (11.9)	46 (14.0)
60 (1524)	24 (610)	19 (5.8)	22 (6.7)	30 (9.1)	35 (10.7)	42 (12.8)
66 (1676)	24 (610)	18 (5.5)	20 (6.0)	27 (8.2)	32 (9.7)	38 (11.6)
72 (1829)	36 (914)		18 (6.4)	25 (7.6)	29 (8.8)	35 (10.7)
78 (1981)	36 (914)			23 (7.0)	27 (8.2)	32 (9.7)
84 (2133)	36 (914)			21 (6.4)	25 (7.6)	30 (9.1)
90 (2286)	36 (914)				24 (7.3)	28 (8.5)
96 (2438)	36 (914)				22 (6.7)	26 (7.9)

[88] NUMBERS IN BRACKETS ARE MAXIMUM FILL HEIGHTS IN FEET

EQUIVALENT THICKNESS

GAUGE NUMBER	THICKNESS -INCHES (mm)	
	STEEL	ALUMINUM
16	0.064 (1.6)	0.060 (1.5)
14	0.079 (2.0)	0.075 (1.9)
12	0.109 (2.8)	0.105 (2.7)
10	0.138 (3.5)	0.135 (3.4)
8	0.168 (4.3)	0.165 (4.2)



H 20 and H 25 Live Loads, Pipe-Arch

Size		Minimum Structural Thickness, Inches	Minimum Cover, Inches	Maximum[7] Cover, Feet
Round Equivalent, Inches	Span x Rise, Inches			2 Tons/Ft.[2] Corner Bearing Pressure
15	17 x 13	0.064	12	16
18	21 x 15	0.064	12	15
21	24 x 18	0.064	12	15
24	28 x 20	0.064	12	15
30	35 x 24	0.064	12	15
36	42 x 29	0.064	12	15
42	49 x 33	0.064*	12	15
48	57 x 38	0.064*	12	15
54	64 x 43	0.079*	12	15
60	71 x 47	0.109*	12	15
66	77 x 52	0.109*	12	15
72	83 x 57	0.138*	12	15

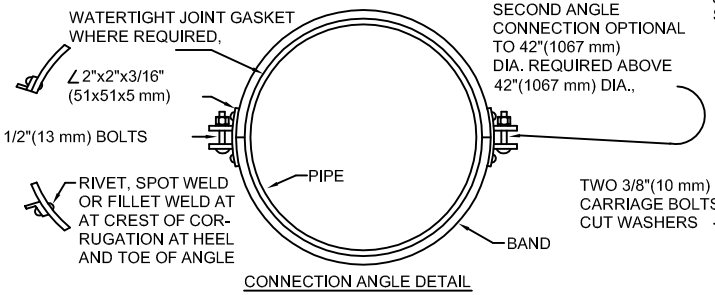
STANDARD COUPLER BANDS

CULVERT SIZE INCHES (mm)	CORRUGATED								Ⓐ FLAT-DIMPLED			
	STANDARD ANNULAR		HELICAL		3" X 1" (76 x 25 mm)		6" X 1" (152 x 25 mm)				NO. OF BOLTS	
	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)	NO. OF ROWS OF DIMPLES	Ⓑ	Ⓒ
UNDER 18" (457)	7" (178)	2	7" (178)	2					10 1/2" (267)	2	2	2
18" TO 54" (457-1372)	12" (305)	3	12" (305)	3	14" (355)	3	18" (457)	3	10 1/2" (267)	2	3	2
OVER 54" (1372)	24" (610)	5	24" (610)	5	24" (610)	5	24" (610)	4	16 1/4" (413)	4	5	4

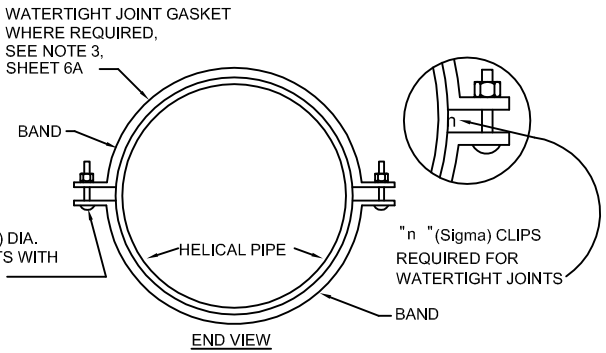
(A)-PERMITTED ONLY FOR CONNECTING ANNULAR CORRUGATED TO HELICAL CORRUGATED PIPE, (B)-FOR CONNECTING METAL END SECTIONS.
(C)-FOR BANDS WITH ANGLES. FOR BANDS WITH TENSION TYPE CONNECTIONS.

PROJECT	SHEET NUMBER
BEAR	40

TYPE A



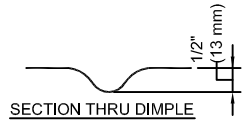
CONNECTION ANGLE DETAIL



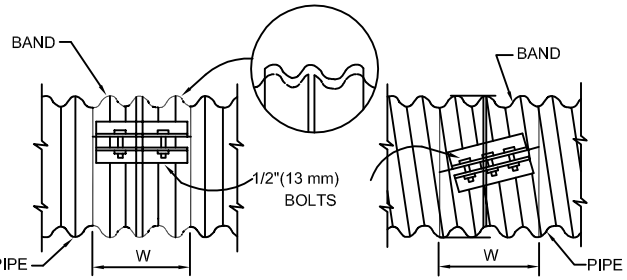
END VIEW

TYPE D

NOTE:
DIMPLED BANDS MAY ONLY BE USED ON PIPES LESS THAN 18" DIA, ON GRADES LESS THAN 10% AND WHEN APPROVED BY THE CONTRACTING OFFICER



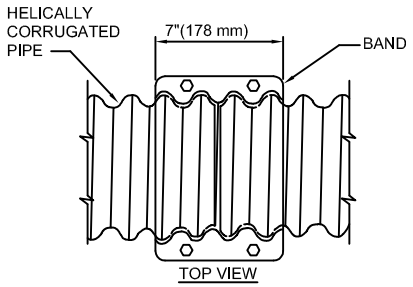
SECTION THRU DIMPLE



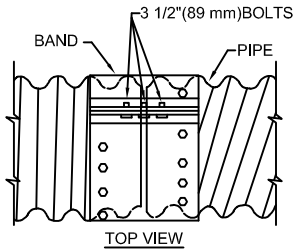
ANNULAR COUPLING HELICAL COUPLING

TYPE B

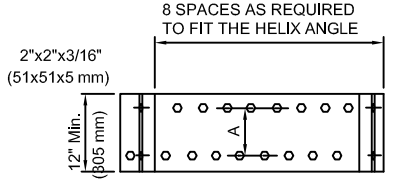
FOR 6"-10" (152-254 mm) DIA. PIPES



TOP VIEW



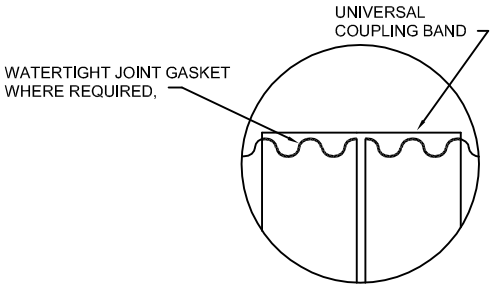
TOP VIEW



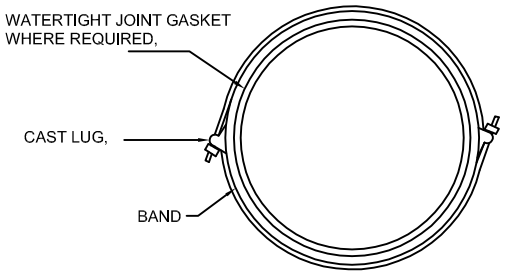
DIMENSION A 7"(178 mm) MIN. BETWEEN DIMPLES AS REQUIRED TO FIT THE HELIX ANGLE

2 2/3"x1/2"(68x13 mm)CORRUGATIONS							3" x 1"(76X25 mm) CORRUGATIONS							
PIPE DIAMETER		W ANN.		W HEL.		# of 1/2" (13 mm) BOLTS	PIPE DIAMETER		W ANN.		W HEL.		# of 1/2" (13 mm) BOLTS
inches	mm	inch.	mm	inch.	mm		inches	mm	inch.	mm	inch.	mm	
6-10	152-254	7	178	7	178	2	36-84 *	914-2134	14	356	14	356	3
12-15	305-381	7	178	12	305	2-3	36-120	914-3048	26	660	26	660	5
18-84 *	457-2134	12	305	12	305	3							
24-84	610-2134	24	610	24	610	5							

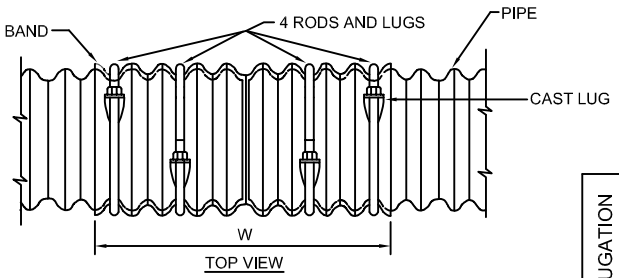
* = SEE THE SPECIFICATIONS



TYPE C



END VIEW



TOP VIEW

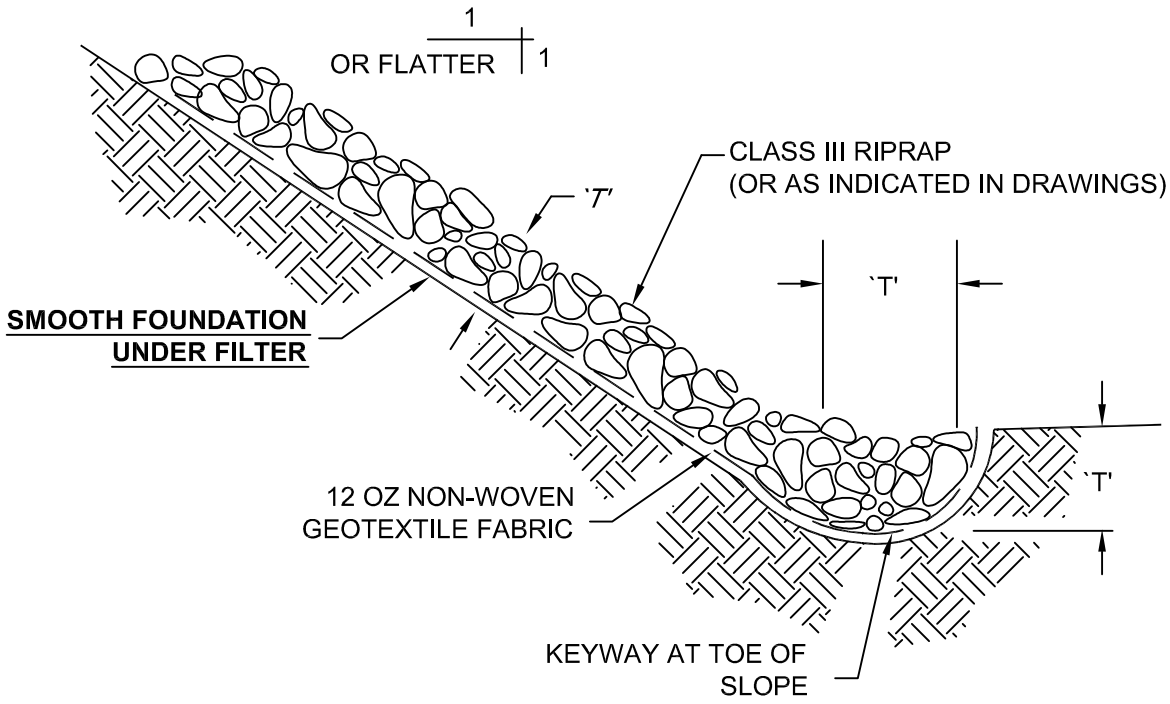
CORRUGATION		PIPE DIAMETER (inch.)	PIPE DIAMETER (mm)	ROD DIA. (inch.)	ROD DIA. (mm)	NARROW BAND W (inch.)	NARROW BAND W (mm)	NARROW BAND # of ROD	WIDE BAND W (inch.)	WIDE BAND W (mm)	WIDE BAND # of ROD
2 2/3" X1/2" (68x13mm)		12-21	305-533	3/8	10	12	305	2			
		24-54 *	610-1372	1/2	13	12	305	2	24	610	4
		60-84 *	1524-2134	5/8	16	12	305	2	24	610	4
3"X1" (76x 25mm)		36-54 *	914-1372	1/2	10	14	356	2	26	660	4
		60-84 *	1524-2134	3/8	13	14	356	2	26	660	4
		84-120	2134-3048	5/8	16				26	660	4

* = SEE THE SPECIFICATIONS

PROJECT	SHEET NUMBER
BEAR	41

RIPRAP SLOPE PROTECTION TYP

NOT TO SCALE

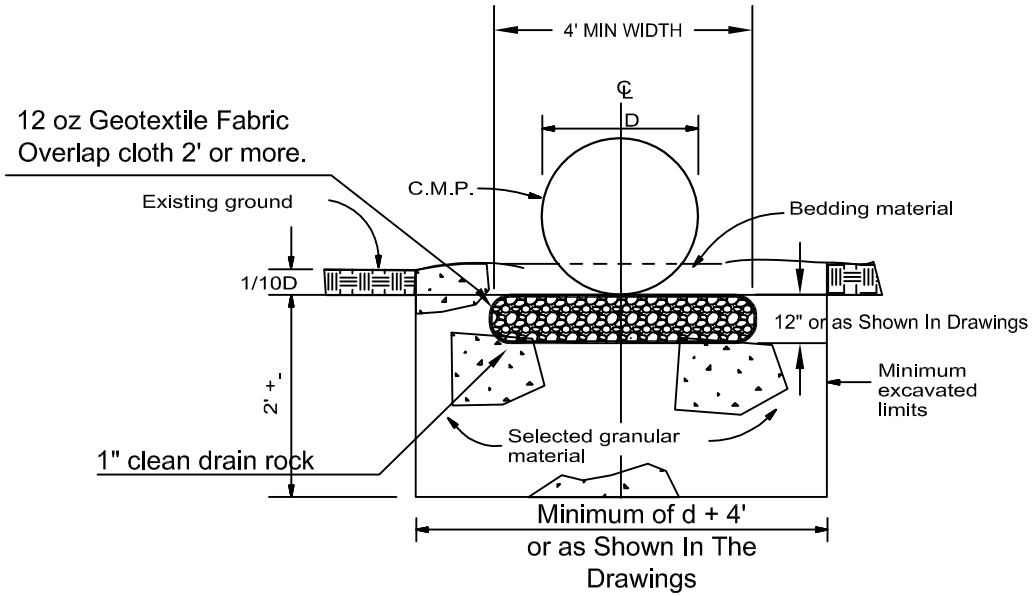


TYPICAL SECTION

NOTE: `T' = THICKNESS: THICKNESS SHALL BE DETERMINED BY THE ENGINEER. MINIMUM THICKNESS SHALL BE 1.5x THE MAXIMUM STONE DIAMETER, NEVER LESS THAN 18".

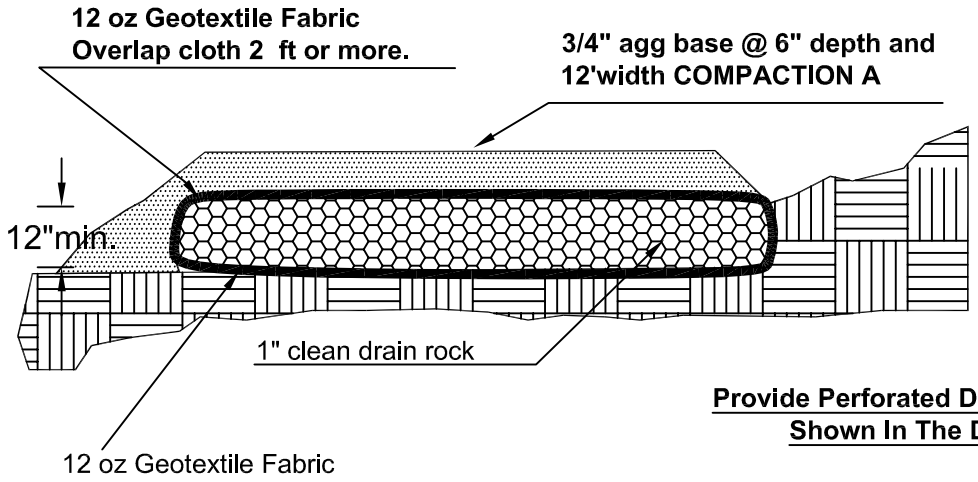
PROJECT	SHEET NUMBER
BEAR	42

GEOTEXTILE CULVERT UNDERDRAIN TYP.



NOTE:
1. Unless shown otherwise, geotextile fabric shall be 12 oz non-woven.
2. Drain rock shall be crushed clean aggregate.
3. Fabric tears shall be repaired by patching with fabric and overlapping 2' min.
4. Excess material shall be either cut and removed or folded and incorporated into overlap material.
5. Provide 4-inch Perforated Drain Pipe when Shown In The Drawings.
6. Dimensions of Underdrains are Shown In The Drawings.

SOIL SEPARATION UNDER DRAIN TYP.



Provide Perforated Drain Pipe when Shown In The Drawings

PROJECT	SHEET NUMBER
BEAR	43

ELDORADO NATIONAL FOREST
LOW TO MID ELEVATION SITES (3,000 TO 5,500 FT)

Apply the following seed / mulch application at all soil disturbance within 50 lf of drainages OR when specified in the Drawings.

This work is incidental to other work in the Contract.

Free seed suitable for this project is available from the Forest Service upon request.

Seed Mixes

Seed shall be state-certified seed of the latest season's crop and shall be delivered in original, sealed packages bearing the producer's guaranteed analysis for percentages of mixtures, purity, germination, weed-seed content, and inert material. Labels shall conform with USDA Federal Seed Act, California Agricultural Code and other applicable seed laws, and shall be acceptable to the County Agricultural Commissioner. Wet, moldy, or otherwise damaged seed will be rejected.

Vulpia microstachys, ssp. "Sierra"	6.0 pounds per acre (Ok source is from Sierra National Forest north of Fresno)
Lotus purshianus, var "Sierra"	4.0 pounds per acre (Northern California source only).
Bromus carinatus, var. carinatus (Eldorado or Mokelumne Brome)	9.0 pounds per acre (OK either source)
Elymus Glaucus, ssp. "El Dorado"	8.0 pounds per acre (OK either item)
Festuca rubra, ssp. "Mokelumne Fescue"	5.0 pounds per acre (*We call this seed F Occidentalis - Mokelumne*
TOTAL	32.0 pounds per acre

Fertilizer

Fertilizer shall be slow-release, organic product, commercial grade, granular free flowing, uniform in composition, delivered in fully-labeled sealed containers, and shall conform to applicable state and federal regulations. Fertilizer shall have the manufacture's guaranteed statement of analysis.

The U.S. Forest Service-approved fertilizer product is BIOSOL Mix 7-2-3.
For Seed Mix A, BIOSOL Mix 7-2-3 will be applied. BIOSOL Mix 7-2-3 will be applied with and application rate of 1000 lbs/ac, reflecting a Nitrogen application rate of 70 lbs/ac and a Phosphorus application rate of 20 lbs/ac.

Timing

Seeding is to be completed between September 15 and October 15, and prior to the onset of the rainy season.

Seeding

Seed should be applied as soon after seedbed preparation and fertilizing as possible, when the soil is loose and moist.

Always apply seed or inocculant before mulch.

Apply seed or inoculant/seed mixture using hand broadcasting, calibrated spreaders, cyclone seeders, mechanical drills, or hydro seeders (only for seed) so the seed is applied uniformly on the site.

Mulching

Straw mulch should be applied over the seeded areas. **Do Not Use Straw Mulch When Cows Are Present. Hand Rake In Seed.**

Straw will be Weed-Free Certified rice straw, applied at 4,000 lbs/AC.

PROJECT	SHEET NUMBER
BEAR	44

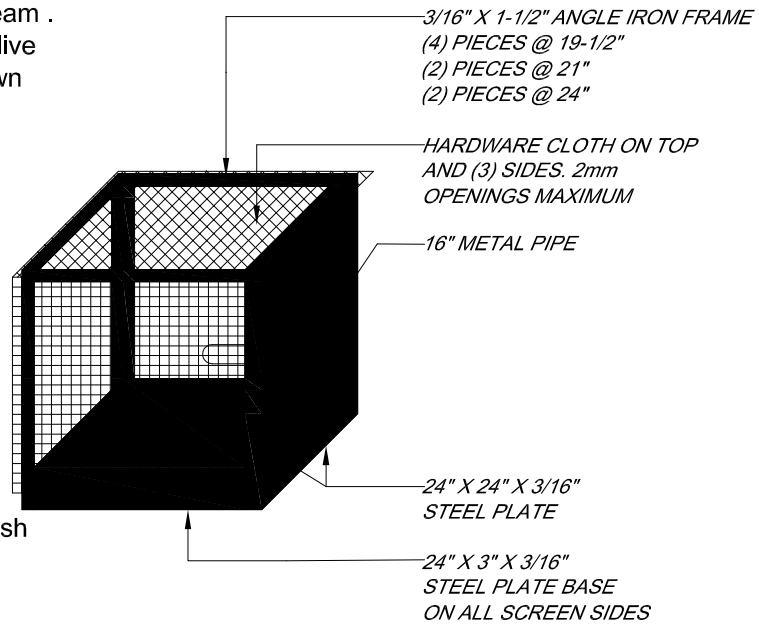
COVERED WATER DRAFTING BOX

NO SCALE

PART 1 GENERAL

1.01 SCOPE

A. This specification shall be included in all contracts that allow drafting of water from a live stream . Approval from the CONTRACTING OFFICER shall be in writing prior to any drafting from a live stream. This work shall include any stream preperation , installation of a screen box as shown on the drawings and other work as required by the CONTRACTING OFFICER .



1.02 MEASUREMENT AND PAYMENT

A. No separate measurement or payment will be made for work defined in this section. Work defined under this section shall be considered as part of the work, and contract price and payment is included in other sections.

PART 2 PRODUCTS AND MATERIALS

2.01 WIRE MESH

A. Wire mesh shall be 2mm openings.
B. The screen box frame shall be constructed of 1-1/2" angle iron , that will support the wire mesh in a secure manner with no joints or holes over 2mm in greatest dimension.

2.02 SCREEN BOX METAL FRAME

A. The metal frame shall have a solid bottom and one solid side of 3/16" metal. The bottom shall be welded a minimum of three (3) inches from the bottom of the screen box. The solid side shall be securely welded to the side frame metal and to the metal bottom.

PART 3 EXECUTION

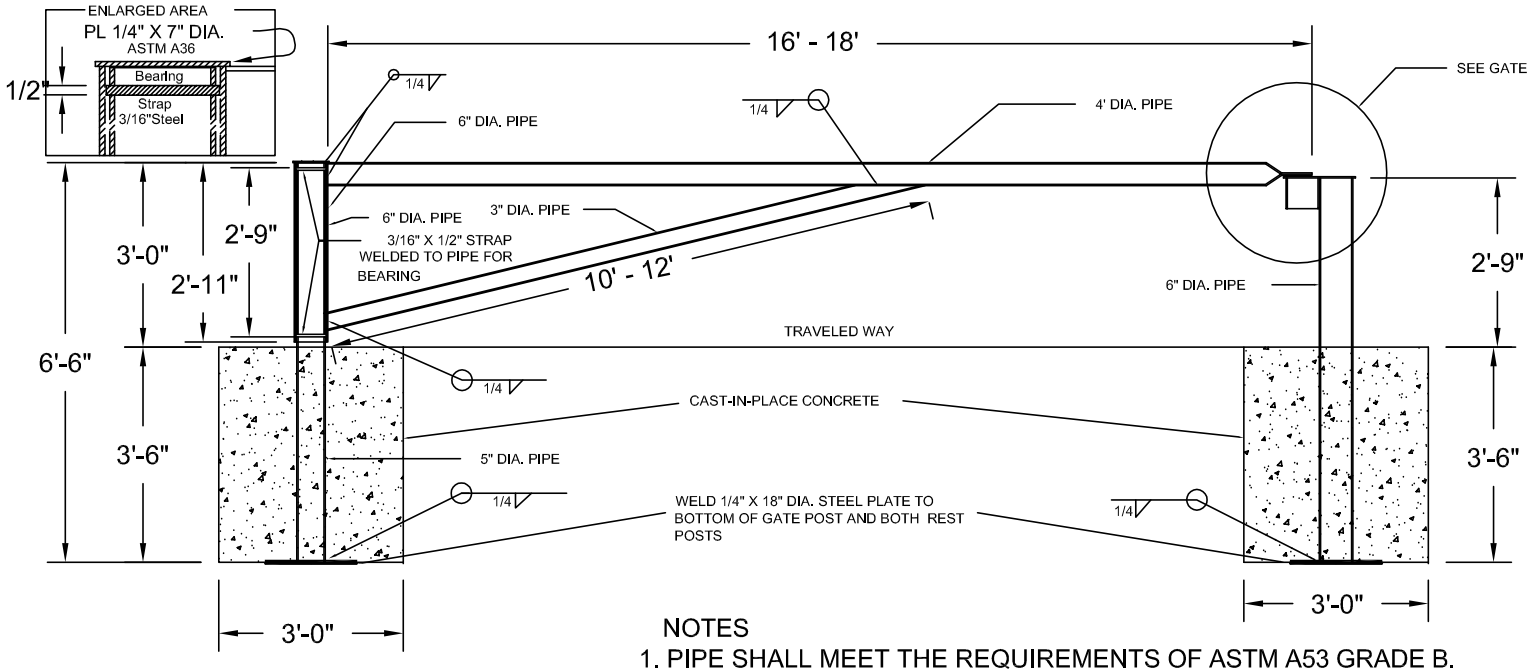
3.01 SCREEN BOX CONSTRUCTION

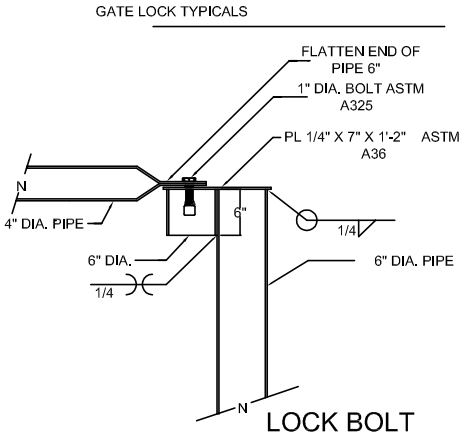
A. A 16" long metal pipe for the drafting hose to be used shall be fixed to the metal side plate a minimum of four inches (4") from the bottom of the screen box. The bottom of the metal pipe and the inlet end of the pipe would be fixed so it is at the center of the screen box as shown on the DRAWING. The outlet end of the pipe may be attached to the drafting hose by any method that will ensure a secure, tight connection.

B. The metal screen shall be securely attached to the outside of the screen box frame with metal screws , bolts , clamps or other method that will securely hold the screen material in place. The three open sides and the top shall be covered with screen . The top of the box should be constructed so that it may be opened to service the inlet pipe and to clean the screen.

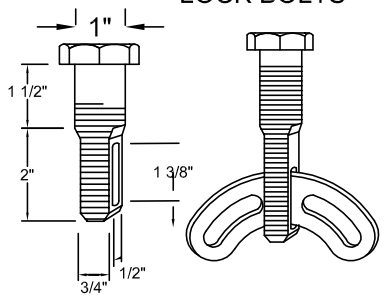
STEEL SINGLE LANE ROAD CLOSURE GATE TYP

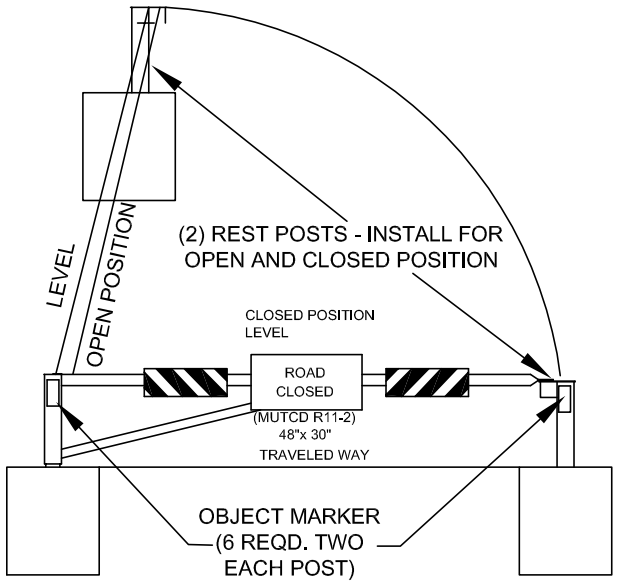
PROJECT	SHEET NUMBER
BEAR	45





LOCK BOLT
MANUFACTURE 3 STE
LOCK BOLTS

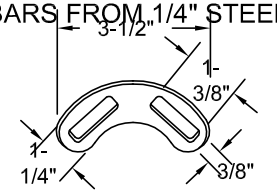


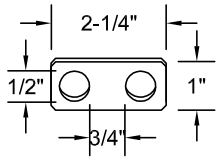


NOTES

1. PIPE SHALL MEET THE REQUIREMENTS OF ASTM A53 GRADE B.
2. PIPE SIZES SHOWN ARE FOR STANDARD WEIGHT BLACK IRON PIPE (SCH.40).
3. GATES SHALL RECEIVE ONE COAT OF ZINC-RICH PRIMER, ORGANIC VEHICLE TYPE AND ONE COAT OF VINYL GREEN (91-2.15). SURFACE PREPARATION AND PRIMING SHALL BE AS RECOMMENDED BY THE PAINT MANUFACTURE.
4. CONCRETE SHALL BE IN ACCORDANCE WITH SPECIFICATION 602 - METHOD C.
5. OVER EXCAVATED POST HOLES SHALL BE FILLED WITH CONCRETE.
6. ROAD CLOSURE SIGN AND REFLECTIVE MARKERS SHALL BE INSTALLED BY CONTRACTOR.
7. CONTRACTOR SHALL FURNISH TO THE FOREST SERVICE ONE COMPLETE LOCK BAR SET AND TWO LOCK BOLTS FOR EACH GATE INSTALLATION.
8. GATE AND LOCKING MECHANISM SHALL BE INSPECTED BY THE FOREST SERVICE PRIOR TO GATE INSTALLATION.
9. LOCATION OF GATES WILL BE LOCATED ON THE GROUND BY THE FOREST SERVICE. LAYOUT OF THE GATE POSTS SHALL BE THE CONTRACTORS RESPONSIBILITY.
10. ROAD CLOSED SIGN SHALL MEET MUTCD REQUIREMENTS FOR TYPE R11-2. (1 REQUIRED.)
11. BARRICADE MARKERS SHALL MEET MUTCD REQUIREMENTS FOR TYPE 1. COLOR - BLACK & WHITE. (2 REQUIRED.)
12. OBJECT MARKERS SHALL MEET MUTCD REQUIREMENTS FOR TYPE 2. (6 REQUIRED.)

LOCK BAR SET
MANUFACTURE 3 CURVED
LOCKBARS AND 2 STRAIGHT
LOCKBARS FROM 1/4" STEEL.



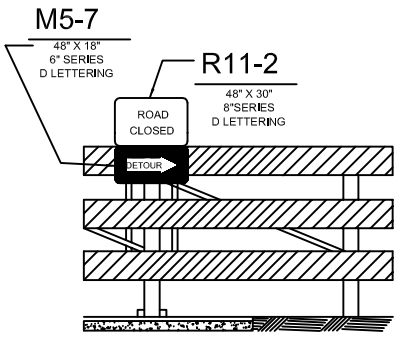


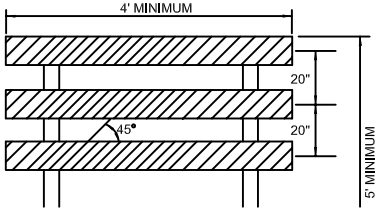
PROJECT	SHEET NUMBER
BEAR	46

TRAFFIC CONTROL DEVICES

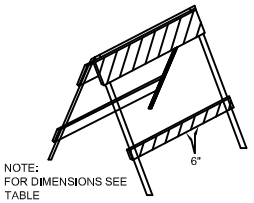
GENERAL NOTES

1. DESIGNS FOR SIGNS AND BARRICADES SHOWN ABOVE ARE IN ACCORDANCE WITH MINIMUM STANDARDS IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" LATEST EDITION.
2. SIGNS SHALL BE MADE FROM SUITABLE MATERIALS WHICH ARE IN ACCORDANCE WITH ALL STATE AND FEDERAL SPEC.
3. SIGNS MAY BE MADE OF WOOD OR METAL WOOD -5/8" PLYWOOD MANUFACTURED WITH ALL SPECIAL WATERPROOF GLUE. METAL SIGNS-16 GAUGE SHEET STOCK WITH EMBOSSED OR VITRIFIED FINISH. WHEN EMBOSSED THE DETAILS OF THE DESIGN ARE RAISED FROM THE BACKGROUND OF THE DESIGN NOT LESS THAN .100" NOR MORE THAN .125".
4. REGULATORY SIGNS SHALL BE RECTANGULAR IN SHAPE WITH THE LARGER DIMENSION VERTICAL AND HAVE BLACK AND WHITE LEGEND OR BACKGROUND. ALL REGULATORY SIGNS UNLESS DEFINITELY EXCEPTED IN THE SPECIFICATIONS, SHALL BE REFLECTORIZED OR ILLUMINATED.
5. ALL SIGNS, UNLESS DEFINITELY EXCEPTED IN THE SPECIFICATIONS, SHALL BE DIAMOND SHAPED (SQUARE WITH ON DIAGONAL VERTICAL) AND SHALL HAVE A HIGHWAY ORANGE BACKGROUND WITH A BLACK LEGEND. ALL WARNING SIGNS HAVING SIGNIFICANCE DURING THE HOURS OF DARK SHALL BE REFLECTORIZED OR ILLUMINATED.
6. SIGNS SHALL BE LOCATED WHERE THEY WILL BE CONSPICUOSLY VISIBLE DAY AND NIGHT ON THE RIGHT HAND SIDE OF APPROACHING TRAFFIC. THEY SHALL BE FACING TRAFFIC AND LOCATED WHERE THEY CAN BE SEEN AT ALL TIMES BY APPROACHING DRIVERS WITH A MINIMUM OF EFFORT.
7. WHEN A SIGN IS REQUIRED FOR AN EXTENDED PERIOD, IT SHALL BE FASTENED TO 4 X 4 POSTS WITH 2, 3/8" CARRIAGE BOLTS. PORTABLE SUPPORTS ARE PERMITTED FOR SHORT PERIODS PROVIDED THE CONSTRUCTION IS SUCH THAT WIND OR OTHER AGENTS CANNOT READILY UPSET THE SIGN.
8. SIGN M4-10R SHALL BE ERRECTED AT THE BEGINNING OF DETOURS, ALONG DETOURS AT 1/4 MILE INTERVALS AND AT ROAD JUNCTIONS ALONG DETOURS IN A GREATLY ENLARGED SIZE IN THIS SIGN IS PRESCRIBED FOR USE ON BARRICADES IN THE ROADWAY WHERE A ROAD IS CLOSED FOR CONSTRUCTION OR MAJOR MAINTENANCE OPERATIONS.
9. SIGN W20-1 SHALL BE ERRECTED 1500' FROM EACH END OF CONSTRUCTION OPERATIONS.
10. SIGN W21-3 AND W11-1 SHALL BE ERRECTED AT EACH END OF AREAS WHERE HEAVY EQUIPMENT IS IN OPERATION AND SHALL BE REPEATED EVERY 1/2 MILE, IF THE OPERATION EXTENDS OVER ONE MILE.
11. OTHER SIGNS SHOWN ABOVE SHALL BE USED AS INDICATED BY THEIR DESIGN.
12. IF OTHER SIGNS NOT SHOWN ARE REQUIRED THEY SHALL ALSO CONFORM IN DESIGN TO THOSE SHOWN IN THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
13. SELECTION AND PLACEMENT OF ALL SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
14. LIGHTING DEVICES SUCH AS FLASHERS, TORCHES, LANTERNS, AND ELECTRIC LIGHTS SHALL BE PLACED AND MAINTAINED FROM SUNSET TO SUNRISE AT ALL POINTS OF HAZARD AND AT ALL SIGNS INDICATING CAUTION.
15. SIGNS TO BE INSTALLED ON ALL HAUL ROADS AND CONSTRUCTION SITES TO PROVIDE ADEQUATE WARNING TO ALL USERS.



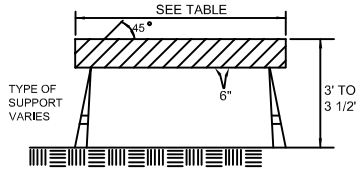


TYPE 111 BARRICADE



NOTE:
FOR DIMENSIONS SEE TABLE

TYPE 11 BARRICADE

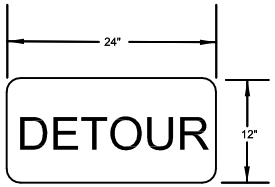


TYPE 1 BARRICADE

TYPE	1	11	111
WIDTH OF RAIL	8" MIN-12" MAX.	8" MIN-12" MAX.	8" MIN-12" MAX.
LENGTH OF RAIL	6'-8'	3' MIN.-4' MAX.	3' MIN.-VARIABLE MAX.
WIDTH OF STRIPES	6 IN.	6 IN.	6 IN.
HEIGHT	3 FT. MIN.	3' MIN.-3 1/2' MAX.	5 FT. MIN.
TYPE OF FRAME	DEMOUNTABLE OR HEAVY "A" FRAME	LIGHT "A" FRAME	POST OR SKIDS
FLEXIBILITY	ESSENTIALLY MOVABLE	PORTABLE	ESSENTIALLY PERMANENT

PROJECT	SHEET NUMBER
BEAR	47

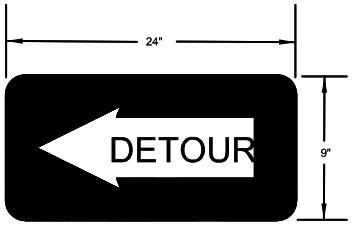
TRAFFIC CONTROL DEVICES



M4-B

24" X 12"

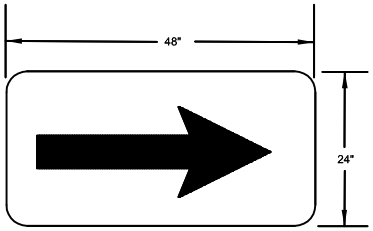
5" SERIES B LETTERING



M4-10R

24" X 9"

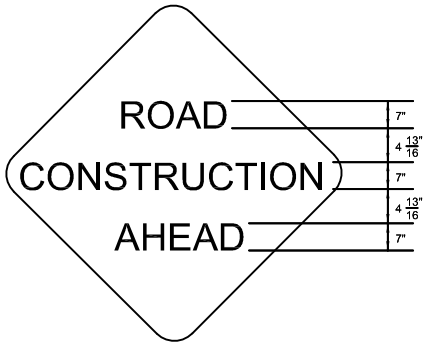
RIGHT OR LEFT
3" SERIES D LETTERING



W1-6

48" X 24"

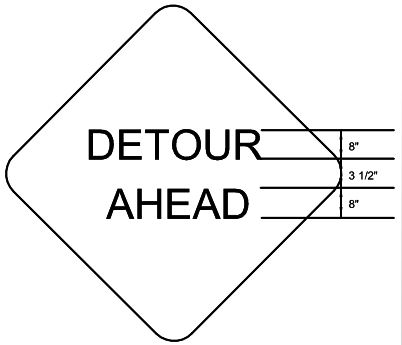
BLACK ARROW RIGHT OR LEFT.



W20-1

48" X 48"

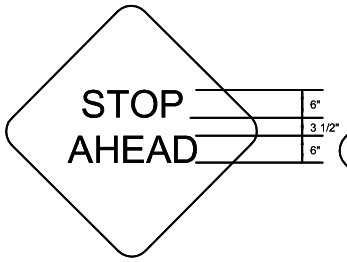
7" SERIES C LETTERING



W20-2d

48" X 48"

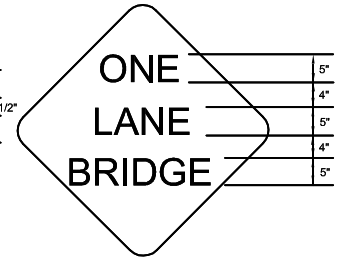
8" SERIES C LETTERING



W3-1

30" X 30"

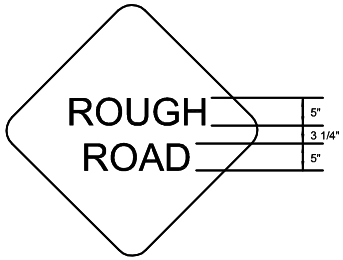
6" SERIES D LETTERING



W5-2

36" X 36"

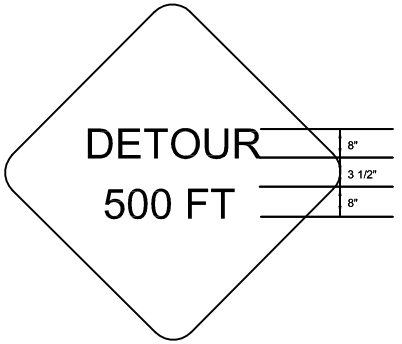
5" SERIES D LETTERING



W8-6

30" X 30"

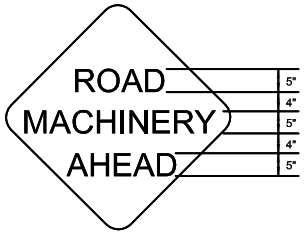
5" SERIES D LETTERING



W20-2c

48" X 48"

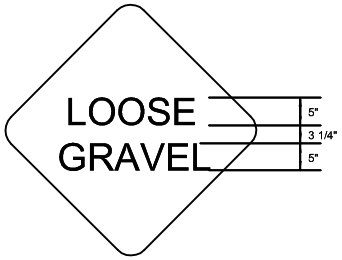
8" SERIES C LETTERING



W21-3

36" X 36"

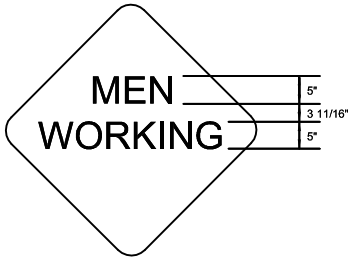
5" SERIES D LETTERING



W8-7

30" X 30"

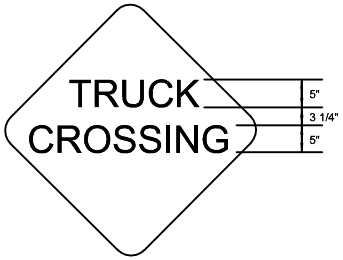
5" SERIES D LETTERING



W21-1

30" X 30"

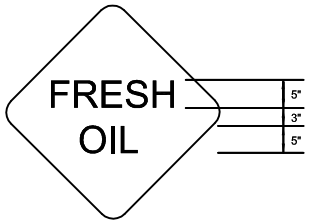
5" SERIES C LETTERING



W11-1

30" X 30"

5" SERIES D LETTERING

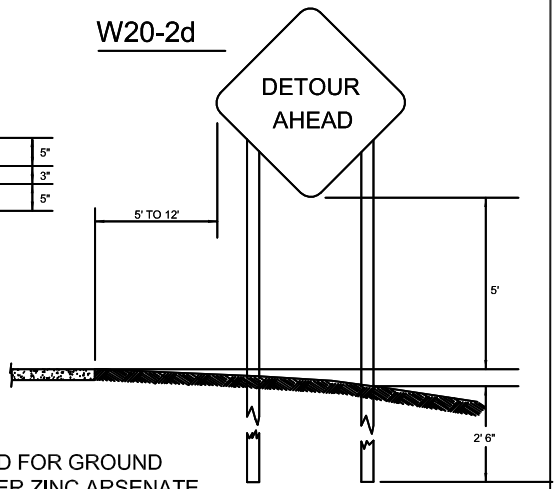


W21-2

24" X 24"

5" SERIES C LETTERING

W20-2d



POST SHALL BE DOUGLAS FIR, TREATED FOR GROUND CONTACT, .40PCF, AMMONIACAL COPPER ZINC ARSENATE (ACZA)