Power Fire Road Reconstruction Project

Background:

The Power Fire Road reconstruction project proposes to replace or reconstruct culverts and water control structures on roads along drainages affected by the 2004 Power Fire that burned 16,933 acres. The power fire is located in southwest corner of the Amador District of the Eldorado National Forest (Figure 1).

Within the Power Fire, there are several perennial rivers and streams including East Panther Creek, Camp Creek, Green Creek, Beaver Creek, Bear River, Cole Creek and the North Fork of Mokelumne River. These streams and rivers incorporate 18 miles of perennial and 26 miles of seasonal streams. The fire perimeter includes meadows, springs and waterholes that exist within the elevation range of 3,100 to 6,792 feet above sea level. The climate in this area is characterized by warm, dry summers and cool, moist winters with an annual average rainfall of 45 inches. The plant communities within the fire area include white fir-dominated mixed conifer, red fir and canyon live oak-hardwood. In addition to consuming more than 180 million board feet of economically viable timber, the fire caused significant environmental damage, including degradation of aquatic habitats and roads.

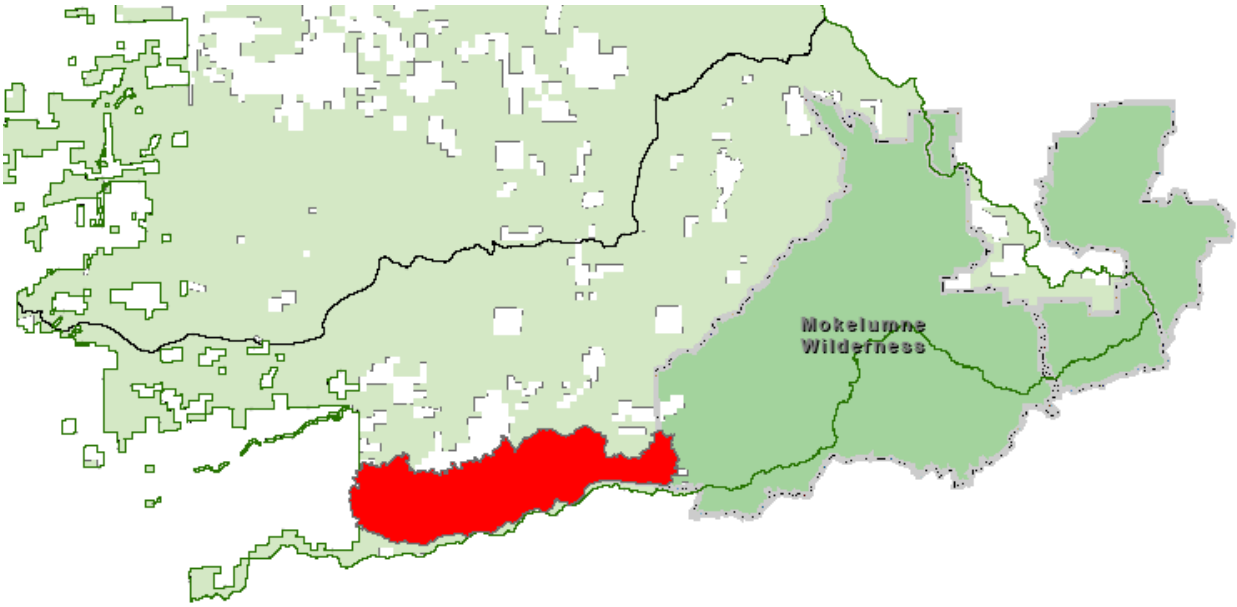


Figure 1: The Power Fire burn area (highlighted in red) within the Amador Ranger District of the Eldorado National Forest.

Objectives:

Manage and replace non-function culverts and water control structures

- With no action, numerous stream crossing sites will continue to deteriorate and degrade increasing in sedimentation to various drainages.
- The desired condition is to improve hydrologic functionality, reduce sedimentation into drainages and road degradation at numerous sites.
- The stream crossing sites proposed to be reconstructed located within suitable and designated critical habitat of the endangered Sierra Nevada yellow-legged (SNYLF) would be designed specifically to protect the frog species and habitat from predatory fish. Design would allow for hydrologic function, but would not improve fish passage, protecting present individual SNYLF and their present habitat.
- Structures will be designed to pass 100 year flow and anticipated sediment and debris.

Proposed Activities:

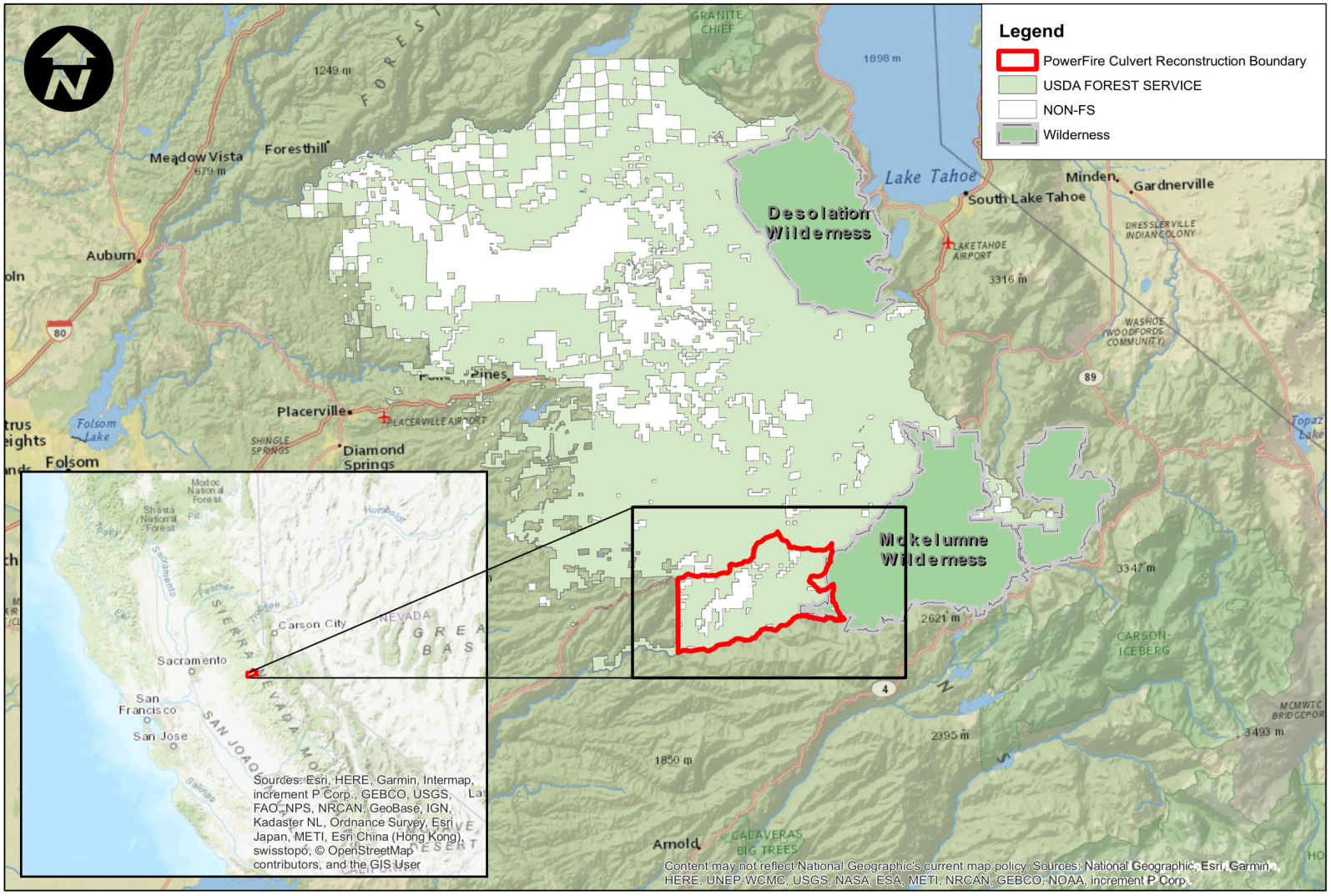
Proposed road reconstruction and improvement activities would be scheduled to occur starting in the summer of 2019 and will continue through 2021. The Proposed Action will include the following:

- Reconstruction of 92 culverts and construction of 2 new water control structures along forest system roads along drainages affected by the power fire. Number may decrease as Forest Service works through the design.
- New water control structures may be a low water crossing, culvert, improved ford, high-water bypass or other feature of similar nature.
- Most existing culverts 18 inches and below will be upsized to 24 inches in diameter, others will be replaced in kind, or sized accordingly based onsite specific hydrologic and hydraulic characteristics.
- Culvert replacements and construction will be performed according to Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-14 and other applicable standard policies and guidelines. Pages 5-7 show typical details for culvert installations.

Project Status:

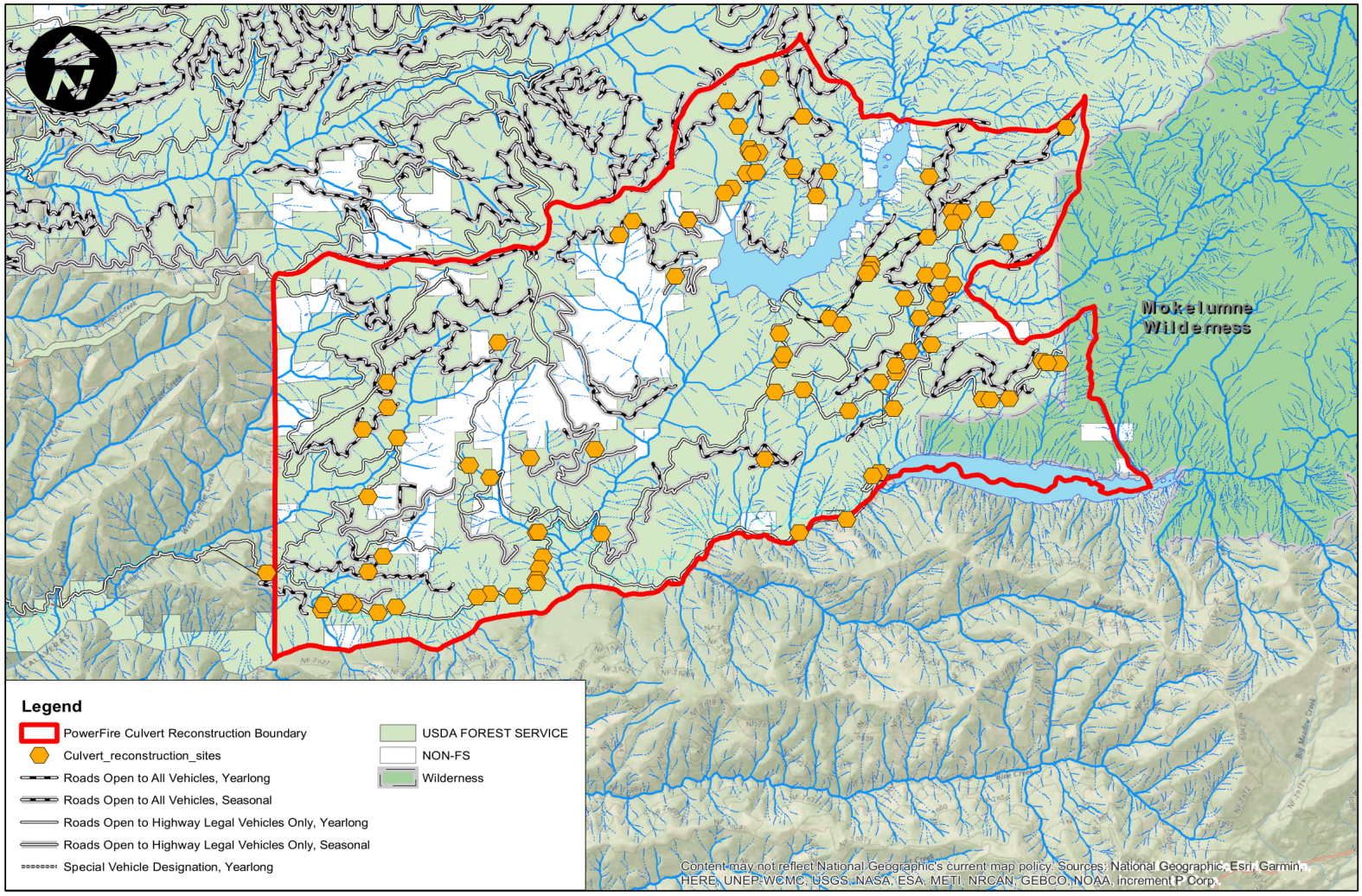
- The Power Fire Road Reconstruction is currently in the NEPA process with consultation with US fish and wildlife service required before a decision can be signed.
- Consultation is required because the project is located in suitable and designated critical habitat for the endangered Sierra Nevada yellow-legged frog.
- Consultation with the US fish and wildlife service will be initiated February, 2018.
- The Power Fire Road Reconstruction Project Decision Notice is expected to be complete after concurrence with US Fish and Wildlife Service likely in April 2019.

Power Fire Road Reconstruction Project

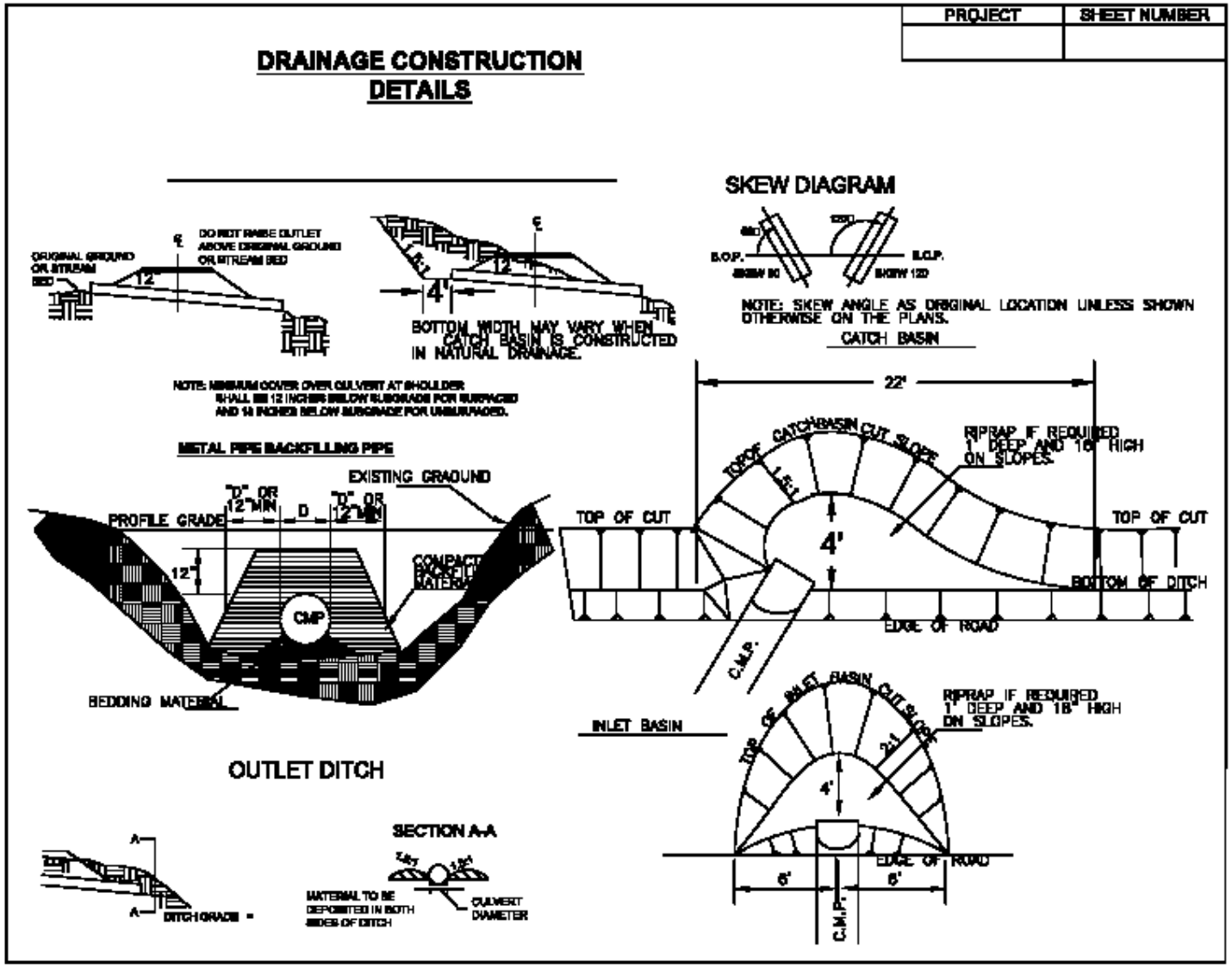


Amador Ranger District, Eldorado National Forest

Power Fire Road Reconstruction Project



Amador Ranger District, Eldorado National Forest


PROJECT
SHEET NUMBER
DRAINAGE CONSTRUCTION DETAILS
SKEW DIAGRAM
NOTE: SKEW ANGLE AS ORIGINAL LOCATION UNLESS SHOWN OTHERWISE ON THE PLANS.
CATCH BASIN
22'
TOP OF CUT
TOP OF CATCHBASIN CUT SLOPE
1:1
RIPRAP IF REQUIRED 1' DEEP AND 18" HIGH ON SLOPES.
4'
BOTTOM OF DITCH
EDGE OF ROAD
C.M.P.
METAL PIPE BACKFILLING PIPE
EXISTING GRADUND
PROFILE GRADE
"D" OR 12" MIN
D
12"
CMP
BEDDING MATERIAL
OUTLET DITCH
INLET BASIN
TOP OF INLET BASIN CUT SLOPE
2:1
6'
C.M.P.
SECTION A-A
MATERIAL TO BE DEPOSITED IN BOTH SIDES OF DITCH
CULVERT DIAMETER
DITCH GRADE =

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

ROUND PIPES

2 2/3" x 1/2" (66 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 ONLY
INCHES (mm)		.064 (1.6)	.079 (2.0)	.109 (2.8)	.138 (3.5)	.168 (4.3)	.060 (1.5)	.075 (1.9)	.105 (2.7)	.135 (3.4)	.164 (4.2)	.060 (1.5)	.075 (1.9)
12 (305)	12 (305)	56 (17.0)	71 (21.7)				49 (14.9)	62 (18.9)	79 (24.0)	81 (24.7)	84 (25.6)	59 (18.0)	33 (10.0)
15 (381)	12 (305)	47 (14.3)	73 (22.3)										
18 (457)	12 (305)	38 (11.6)	61 (18.6)				29 (8.8)	38 (11.6)	58 (17.7)	64 (19.5)	68 (20.7)	48 (14.6)	29 (8.8)
24 (610)	12 (305)	42 (12.8)	48 (14.6)	68 (20.7)			22 (6.7)	28 (8.5)	39 (11.9)	41 (12.5)	43 (13.1)	34 (10.4)	14 (4.3)
30 (762)	12 (305)	34 (10.4)	38 (11.6)	47 (14.3)			18 (5.5)	19 (5.8)	31 (9.4)	33 (10.1)	34 (10.4)	27 (8.2)	11 (3.4)
36 (914)	12 (305)	28 (8.5)	35 (10.7)	39 (11.9)	41 (12.5)		15 (4.6)	16 (4.9)	26 (7.9)	27 (8.2)	28 (8.5)	22 (6.7)	9 (2.7)
42 (1067)	12 (305)	31 (9.4)	43 (13.1)	43 (13.1)	43 (13.1)	43 (13.1)		23 (7.0)	33 (10.1)	33 (10.1)	33 (10.1)	26 (7.9)	11 (3.4)
48 (1219)	12 (305)	27 (8.2)	37 (11.3)	43 (13.1)	43 (13.1)	43 (13.1)			29 (8.8)	29 (8.8)	29 (8.8)	23 (7.0)	
54 (1372)	12 (305)		33 (10.1)	43 (13.1)	43 (13.1)	43 (13.1)			26 (7.9)	26 (7.9)	26 (7.9)	20 (6.1)	
60 (1524)	12 (305)			43 (13.1)	43 (13.1)	43 (13.1)				23 (7.0)	23 (7.0)	18 (5.5)	
66 (1676)	12 (305)			43 (13.1)	43 (13.1)	43 (13.1)				21 (6.4)	21 (6.4)	16 (4.9)	
72 (1829)	12 (305)				43 (13.1)	43 (13.1)					19 (5.8)	15 (4.6)	
78 (1981)	12 (305)				41 (12.5)	43 (13.1)						14 (4.3)	
84 (2134)	12 (305)					38 (11.6)						13 (4.0)	

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 (2.0)	.109 (2.8)	.138 (3.5)	.168 (4.3)
36 (914)	12 (305)	48 (14.6)	60 (18.3)	79 (24.0)	86 (26.2)	93 (28.3)
42 (1067)	12 (305)	41 (12.5)	51 (15.5)	68 (20.7)	74 (22.6)	81 (24.7)
48 (1219)	12 (305)	36 (11.0)	45 (13.7)	59 (18.0)	64 (19.5)	71 (21.6)
54 (1372)	12 (305)	32 (9.8)	40 (12.2)	53 (16.2)	57 (17.4)	63 (19.2)
60 (1524)	12 (305)	29 (8.8)	36 (11.0)	47 (14.3)	51 (15.5)	57 (17.4)
66 (1676)	12 (305)	26 (7.9)	33 (10.1)	43 (13.1)	47 (14.3)	52 (15.8)
72 (1829)	12 (305)	24 (7.3)	30 (9.1)	39 (11.9)	43 (13.1)	48 (14.6)
78 (1981)	12 (305)	22 (6.7)	28 (8.5)	36 (11.0)	40 (12.2)	44 (13.4)
84 (2134)	12 (305)	21 (6.4)	26 (7.9)	34 (10.4)	37 (11.3)	41 (12.5)
90 (2286)	12 (305)	19 (5.8)	24 (7.3)	31 (9.4)	34 (10.4)	38 (11.6)
96 (2438)	12 (305)	18 (5.5)	23 (7.0)	29 (8.8)	32 (9.8)	35 (10.7)
102 (2591)	24 (610)	17 (5.2)	21 (6.4)	27 (8.2)	30 (9.1)	33 (10.1)
108 (2743)	24 (610)		20 (6.1)	26 (7.9)	28 (8.5)	31 (9.4)
114 (2896)	24 (610)		19 (5.8)	24 (7.3)	27 (8.2)	29 (8.8)
120 (3048)	24 (610)			23 (7.0)	25 (7.6)	28 (8.5)

[ ] NUMBERS IN BRACKETS ARE MAXIMUM FILL HEIGHTS IN FEET

5" 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)	.164 (4.2)
36 (914)	12 (305)	38 (11.6)	47 (14.3)	66 (20.1)	66 (20.1)	66 (20.1)
42 (1067)	12 (305)	34 (10.4)	41 (12.5)	57 (17.4)	57 (17.4)	57 (17.4)
48 (1219)	12 (305)	31 (9.4)	37 (11.3)	50 (15.2)	50 (15.2)	50 (15.2)
54 (1372)	12 (305)	28 (8.5)	33 (10.1)	44 (13.4)	44 (13.4)	44 (13.4)
60 (1524)	12 (305)	25 (7.6)	30 (9.1)	40 (12.2)	40 (12.2)	40 (12.2)
66 (1676)	12 (305)	23 (7.0)	27 (8.2)	36 (11.0)	36 (11.0)	36 (11.0)
72 (1829)	12 (305)	21 (6.4)	25 (7.6)	33 (10.1)	33 (10.1)	33 (10.1)
78 (1981)	12 (305)	19 (5.8)	23 (7.0)	30 (9.1)	30 (9.1)	30 (9.1)
84 (2134)	12 (305)	18 (5.5)	21 (6.4)	28 (8.5)	28 (8.5)	28 (8.5)
90 (2286)	12 (305)	16 (4.9)	20 (6.1)	26 (7.9)	26 (7.9)	26 (7.9)
96 (2438)	12 (305)	15 (4.6)	18 (5.5)	24 (7.3)	24 (7.3)	24 (7.3)
102 (2591)	24 (610)	14 (4.3)	17 (5.2)	23 (7.0)	23 (7.0)	23 (7.0)
108 (2743)	24 (610)	13 (4.0)	16 (4.9)	21 (6.4)	21 (6.4)	21 (6.4)
114 (2896)	24 (610)	12 (3.7)	15 (4.6)	20 (6.1)	20 (6.1)	20 (6.1)
120 (3048)	24 (610)	12 (3.7)	14 (4.3)	19 (5.8)	19 (5.8)	19 (5.8)

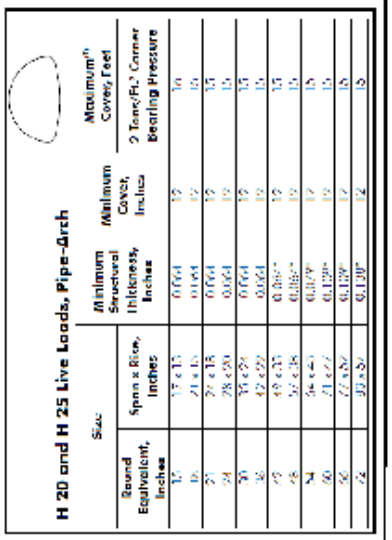
STANDARD COUPLER BANDS

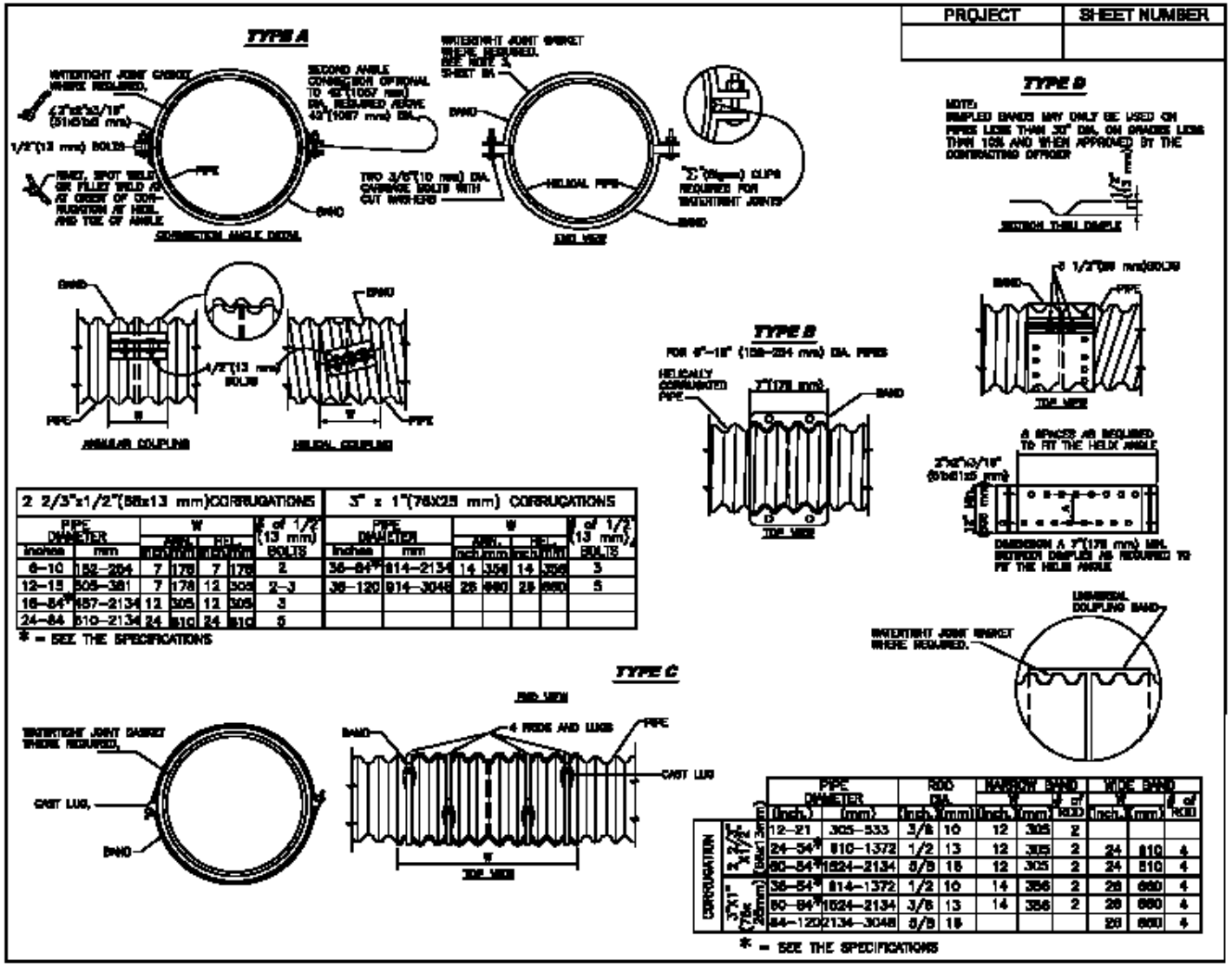
CULVERT SIZE INCHES (mm)	CORRUGATED								Ⓐ FLAT-DIMPLED			
	STANDARD ANGULAR		HELICAL		3" X 1" (76 x 25 mm)		5" X 1" (152 x 25 mm)			NO. OF RIBES OR DIMPLES	NO. OF BOLTS	
	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)	NO. OF BOLTS	WIDTH INCHES (mm)		Ⓑ	Ⓒ
UNDER 18" (457)	7" (178)	2	7" (178)	2					NO 1/2"(305)	2	2	2
18" TO 84" (457-1372)	12" (305)	3	12" (305)	3	14" (356)	3	18" (457)	3	NO 1/2"(305)	2	3	2
OVER 84" (1372)	24" (610)	5	24" (610)	5	24" (610)	5	24" (610)	4	18 1/4"(470)	4	5	4

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

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)




PROJECT
SHEET NUMBER
TYPE A
TYPE B
TYPE C
2 2/3"x1/2"(68x13 mm)CORRUGATIONS
3" x 1"(76X25 mm) CORRUGATIONS
* = SEE THE SPECIFICATIONS