Note to Designer:
The information presented in this Standard Detail has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without competent professional examination and verification of its suitability and applicability by a licensed professional engineer. Contents within the inner border line shall not be altered.

RIGHT ANGLE

Mark	Bend	90° ⊕		96° ⊕		102° ⊕		108° ⊕		114° ⊕		120° ⊕		126° ⊕		132° ⊕		138° ⊕		144° ⊕	
		No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth
h	D	17	9'-3	18	9'-3	19	9'-3	20	9'-3	21	9'-3	22	9'-3	23	9'-3	24	9'-3	25	9'-3	26	9'-3
j	str	8	26'-6	8	28'-0	8	29'-6	8	31'-0	8	32'-6	8	34'-0	8	35'-6	8	37'-0	8	38'-6	8	40'-0
k	E	17	7'-0	18	7'-0	19	7'-0	20	7'-0	21	7'-0	22	7'-0	23	7'-0	24	7'-0	25	7'-0	26	7'-0
r1	str	9	23'-6	9	24'-9	9	26'-3	9	27'-6	9	29'-0	11	30'-3	11	31'-9	11	33'-0	13	34'-6	13	36'-0
r2	str	4	18'-0	4	20'-0	4	21'-6	4	24'-0	4	25'-6	4	25'-0	4	28'-0	4	29'-6	4	29'-0	4	30'-6
r3	str	4	12'-6	4	15'-0	4	16'-6	4	18'-6	4	20'-6	4	19'-9	4	22'-3	4	24'-3	4	23'-9	4	25'-3
r4	str	4	7'-0	4	10'-0	4	11'-6	4	13'-0	4	15'-6	4	14'-6	4	16'-6	4	19'-0	4	18'-3	4	20'-0
r5	str							2	10'-0	2	12'-0	2	9'-0	4	11'-0	4	14'-0	4	13'-0	4	14'-9
s	str	57	2'-0	60	2'-0	64	2'-0	67	2'-0	70	2'-0	74	2'-0	77	2'-0	80	2'-0	84	2'-0	87	2'-0
t1	str	4	8'-0	4	8'-6	4	8'-9	5	9'-3	5	9'-9	5	10'-3	5	10'-9	5	11'-0	6	11'-6	6	12'-0
t2	str	4	10'-6	4	11'-3	4	11'-6	4	12'-3	5	13'-0	5	13'-6	5	14'-3	5	14'-9	5	15'-3	6	16'-0
t3	str	4	13'-0	4	14'-3	4	14'-6	4	15'-3	4	16'-0	5	17'-0	5	17'-9	5	18'-3	5	19'-3	5	20'-0
t4	str	3	15'-6	4	17'-3	4	17'-3	4	18'-3	4	19'-3	4	20'-3	5	21'-3	5	22'-0	5	23'-0	5	24'-0
t5	str	3	18'-0	4	20'-0	4	20'-0	4	21'-3	4	22'-6	4	23'-6	5	24'-9	5	25'-9	5	26'-9	5	28'-0
t6	str	3	20'-6	3	22'-0	4	23'-0	4	24'-3	4	25'-6	4	27'-0	4	28'-3	5	29'-3	5	30'-9	5	32'-0
t7	str	3	23'-0	3	24'-3	3	25'-9	4	27'-3	4	28'-9	4	30'-3	4	31'-9	4	33'-0	5	34'-6	5	36'-0

15° SKEW

Mark	Bend	90° ⊕		96° ⊕		102° ⊕		108° ⊕		114° ⊕		120° ⊕		126° ⊕		132° ⊕		138° ⊕		144° ⊕	
		No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth
h	D	18	9'-3	19	9'-3	20	9'-3	21	9'-3	22	9'-3	23	9'-3	24	9'-3	25	9'-3	26	9'-3	27	9'-3
j	str	8	26'-0	8	27'-6	8	29'-0	8	30'-6	8	32'-0	8	33'-6	8	35'-0	8	36'-6	8	38'-0	8	39'-6
k	E	18	7'-0	19	7'-0	20	7'-0	21	7'-0	22	7'-0	23	7'-0	24	7'-0	25	7'-0	26	7'-0	27	7'-0
r1	str	9	22'-6	9	23'-9	9	25'-3	10	26'-6	10	28'-0	10	29'-3	11	30'-9	12	32'-3	12	33'-6	13	35'-0
r2	str	2	20'-0	2	22'-6	2	23'-6	3	22'-6	3	23'-6	3	26'-0	3	27'-6	3	28'-0	3	29'-0	3	30'-6
r3	str	2	18'-6	2	19'-3	2	20'-6	2	19'-3	2	20'-3	3	21'-0	3	23'-0	3	23'-3	3	24'-6	3	25'-9
r4	str	2	15'-3	2	16'-3	2	17'-6	2	16'-0	2	17'-0	2	18'-0	3	18'-6	3	18'-6	3	20'-0	3	21'-3
r5	str	2	11'-9	2	13'-3	2	14'-6	2	13'-0	2	14'-0	2	15'-0	2	15'-3	3	14'-0	3	15'-6	3	16'-6
r6	str	2	8'-3	2	10'-0	2	11'-6	2	9'-9	2	10'-9	2	12'-0	2	12'-3	2	11'-0	3	11'-0	3	11'-6
r7	str	2	5'-0	2	7'-0	2	8'-6	2	6'-6	2	7'-6	2	9'-0	2	9'-3	2	7'-6	2	8'-0	3	7'-0
r8	str	1	8'-0	1	11'-0	1	16'-0	1	17'-6	2	15'-0	2	17'-0	1	20'-0	1	25'-0	2	19'-0	2	15'-0
s	str	56	2'-0	59	2'-0	62	2'-0	65	2'-0	68	2'-0	71	2'-0	74	2'-0	77	2'-0	80	2'-0	83	2'-0
t1	str	3	8'-0	3	8'-6	3	9'-0	3	9'-6	3	10'-0	4	10'-6	4	11'-0	4	11'-6	4	12'-0	4	12'-6
t2	str	3	10'-6	3	10'-9	3	11'-3	3	11'-6	3	12'-3	3	13'-6	4	14'-0	4	15'-3	4	15'-3	4	15'-3
t3	str	3	12'-9	3	13'-3	3	13'-9	3	13'-6	3	14'-6	3	15'-9	3	17'-0	4	19'-0	4	18'-3	4	18'-3
t4	str	2	15'-6	3	15'-6	3	16'-3	3	15'-6	3	16'-9	3	18'-3	3	19'-6	3	21'-0	4	21'-6	4	21'-3
t5	str	2	17'-0	3	18'-0	3	18'-6	3	17'-6	3	19'-0	3	20'-6	3	21'-9	3	23'-3	3	24'-0	4	24'-0
t6	str	2	18'-6	2	20'-0	3	21'-0	3	19'-6	3	21'-6	3	23'-0	3	24'-3	3	25'-6	3	26'-6	3	27'-6
t7	str	2	20'-0	2	21'-9	2	23'-0	3	21'-6	3	23'-9	3	25'-3	3	26'-9	3	28'-0	3	29'-0	3	30'-0
t8	str	2	21'-6	2	23'-3	2	24'-6	2	25'-6	3	26'-0	3	27'-6	3	29'-0	3	30'-3	3	31'-6	3	32'-6
t9	str	2	23'-0	2	25'-0	2	26'-0	2	27'-0	2	28'-0	3	30'-0	3	31'-6	3	32'-6	3	34'-0	3	35'-0
t10	str	1	17'-6	1	21'-0	1	24'-0	2	18'-0	2	16'-0	2	16'-0	2	18'-0	2	23'-0	2	26'-0	2	24'-0
t11	str	1	25'-0	1	26'-6	1	28'-0	1	29'-6	1	31'-0	1	32'-6	1	34'-0	1	35'-6	1	37'-0	1	38'-6

30° SKEW

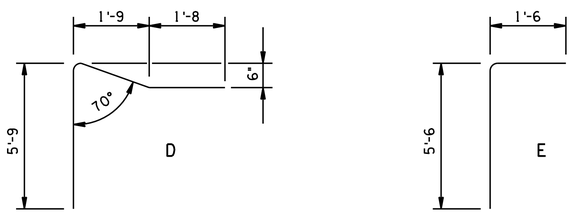
Mark	Bend	90° ⊕		96° ⊕		102° ⊕		108° ⊕		114° ⊕		120° ⊕		126° ⊕		132° ⊕		138° ⊕		144° ⊕	
		No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth
h	D	23	9'-3	24	9'-3	25	9'-3	26	9'-3	27	9'-3	28	9'-3	29	9'-3	30	9'-3	31	9'-3	32	9'-3
j	str	8	34'-0	8	35'-6	8	37'-3	8	39'-0	8	40'-9	8	42'-3	8	44'-0	8	45'-9	8	47'-3	8	49'-0
k	E	23	7'-0	24	7'-0	25	7'-0	26	7'-0	27	7'-0	28	7'-0	29	7'-0	30	7'-0	31	7'-0	32	7'-0
r1	str	9	19'-6	10	20'-6	10	21'-6	11	22'-6	11	23'-6	12	24'-6	13	25'-6	13	26'-6	14	27'-6	14	28'-6
r2	str	3	18'-0	3	18'-6	3	19'-6	3	20'-0	3	21'-6	3	22'-0	3	23'-0	4	24'-0	4	24'-6	4	26'-0
r3	str	2	16'-3	3	16'-0	3	18'-3	3	17'-9	3	19'-3	3	19'-6	3	20'-6	3	21'-6	4	21'-0	4	22'-9
r4	str	2	14'-9	2	14'-6	3	17'-0	3	15'-3	3	17'-0	3	17'-3	3	18'-3	3	19'-0	3	18'-6	4	19'-6
r5	str	2	13'-0	2	12'-9	2	15'-0	3	13'-0	3	14'-6	3	14'-9	3	15'-9	3	16'-6	3	16'-0	3	16'-6
r6	str	2	11'-6	2	11'-3	2	12'-9	2	11'-3	3	12'-3	3	12'-6	3	13'-3	3	14'-0	3	13'-6	3	14'-0
r7	str	2	9'-9	2	9'-9	2	10'-9	2	9'-9	3	10'-0	3	10'-0	3	10'-9	3	11'-6	3	11'-0	3	11'-9
r8	str	2	8'-3	2	8'-0	2	8'-6	2	8'-3	2	8'-3	2	8'-3	3	8'-6	3	9'-0	3	8'-6	3	9'-3
r9	str	2	6'-6	2	6'-6	2	6'-6	2	6'-6	2	6'-6	2	6'-6	3	6'-6	3	6'-6	3	6'-0	3	7'-0
s	str	60	2'-0	63	2'-0	65	2'-0	68	2'-0	71	2'-0	73	2'-0	76	2'-0	79	2'-0	81	2'-0	84	2'-0
t1	str	3	9'-3	3	9'-9	3	10'-3	3	11'-0	3	11'-6	3	12'-0	3	12'-0	4	13'-0	4	13'-9	4	14'-3
t2	str	3	12'-9	3	13'-3	3	13'-9	3	14'-6	3	15'-0	3	15'-6	3	16'-0	3	17'-6	4	18'-6	4	19'-0
t3	str	3	16'-6	3	17'-0	3	17'-6	3	18'-0	3	18'-9	3	19'-3	3	19'-9	3	21'-0	3	21'-6	4	23'-9
t4	str	2	20'-0	2	21'-0	3	21'-0	3	21'-6	3	22'-3	3	22'-9	3	23'-3	3	24'-9	3	25'-6	4	28'-6
t5	str	2	22'-6	2	23'-3	2	24'-0	3	25'-0	3	25'-9	3	26'-3	3	26'-9	3	28'-3	3	29'-6	3	33'-0
t6	str	2	25'-0	2	25'-6	2	26'-9	2	28'-0	3	29'-6	3	30'-0	3	30'-3	3	31'-9	3	33'-6	3	36'-9
t7	str	2	27'-6	2	27'-9	2	29'-3	2	30'-6	3	33'-0	3	33'-3	3	34'-0	3	35'-6	3	37'-6	3	40'-3
t8	str	2	30'-0	2	30'-0	2	32'-0	2	33'-0	2	36'-6	2	36'-6	3	37'-6	3	39'-0	3	41'-6	2	44'-0
t9	str			1	25'-0	1	26'-0	1	29'-0			1	27'-0	1	35'-0	1	34'-0	1	37'-0	1	38'-0
t10	str	1	33'-3	1	35'-0	1	35'-9	1	38'-6	1	40'-3	1	42'-0	1	43'-9	1	45'-6	1	47'-3	1	49'-0

45° SKEW

Mark	Bend	90° ⊕		96° ⊕		102° ⊕		108° ⊕		114° ⊕		120° ⊕		126° ⊕		132° ⊕		138° ⊕		144° ⊕	
		No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth	No	Lgth
h	D	29	9'-3	30	9'-3	32	9'-3	33	9'-3	34	9'-3	36	9'-3	37	9'-3	38	9'-3	40	9'-3	41	9'-3
j	str	8	44'-0	8	46'-0	8	48'-0	8	50'-0	8	52'-0	8	54'-0	8	56'-0	8	58'-0	8	60'-0	8	62'-0
k	E	29	7'-0	30	7'-0	32	7'-0	33	7'-0	34	7'-0	36	7'-0	37	7'-0	38	7'-0	40	7'-0	41	7'-0
r1	str	11	15'-6	12	16'-3	13	17'-3	14	18'-3	14	19'-0	15	20'-0	16	20'-9	16	21'-9	17	22'-6	17	23'-6
r2	str	4	14'-0	4	15'-6	4	16'-6	4	17'-3	4	17'-0	4	18'-0	4	18'-9	4	19'-6	4	20'-3	4	22'-0
r3	str	3	12'-6	3	14'-0	3	15'-0	3	15'-9	3	15'-3	3	16'-6	4	16'-9	4	17'-6	4	18'-3	4	19'-9
r4	str	3	11'-0	3	12'-9	3	13'-3	3	14'-0	3	14'-0	3	15'-0	4	15'-0	4	15'-6	4	16'-0	4	17'-9
r5	str	3	9'-6	3	11'-3	3	11'-9	3	12'-6	3	12'-3	3	13'-6	3	13'-0	4	13'-6	4	14'-0	4	15'-6
r6	str	3	8'-0	3	9'-9	3	10'-3	3	10'-9	3	11'-0	3	12'-0	3	11'-6	3	11'-9	4	12'-0	4	13'-3
r7	str	3	6'-6	3	8'-3	3	8'-9	3	9'-3	3	9'-3	3	10'-6	3	10'-0	3	10'-3	3	10'-6	4	11'-3
r8	str	3	5'-0	3	7'-0	3	7'-0	3	7'-9	3	8'-3	3	9'-0	3	8'-6	3	8'-9	3	9'-0	4	9'-0
r9	str	3	3'-6	3	5'-6	3	5'-6	3	5'-0	3	6'-3	3	7'-6	3	7'-0	3	7'-6	3	7'-6	3	7'-6
r10	str			2	4'-6	2	4'-6	3	4'-6	3	5'-0	3	6'-0	3	5'-6	3	6'-0	3	6'-0	3	6'-6
s	str	58	2'-0	61	2'-0	64	2'-0	67	2'-0	70	2'-0	73	2'-0	76	2'-0	79	2'-0	82	2'-0	85	2'-0
t1	str	2	11'-6	2	12'-3	2	13'-0	2	13'-9	3	14'-6	3	15'-3	3	16'-0	3	16'-9	3	17'-6	3	18'-3
t2	str	2	15'-9	2	16'-3	2	17'-0	2	18'-0	3	20'-6	3	21'-0	3	22'-0	3	23'-0	3	23'-6	3	24'-9
t3	str	2	20'-0	2	20'-6	2	21'-3	2	22'-0	2	26'-6	2	27'-0	3	28'-0	3	29'-0	3	29'-6	3	31'-3
t4	str	2	24'-3	2	24'-6	2	25'-6	2	26'-3	2	30'-6	2	31'-3	2	34'-0	3	35'-3	3	35'-6	3	37'-9
t5	str	2	28'-3	2	28'-9	2	29'-6	2	30'-6	2	34'-3	2	35'-6	2	38'-0	2	41'-6	3	41'-6	3	44'-0
t6	str	2	32'-6	2	32'-9	2	33'-9	2	34'-9	2	38'-3	2	39'-6	2	42'-0	2	45'-0	2	47'-0	3	50'-6
t7	str	2	36'-9	2	36'-9	2	37'-9	2	38'-9	2	42'-0	2	43'-9	2	46'-0	2	48'-6	2	50'-6	2	57'-0
t8	str	1	41'-0	2	41'-0	2	42'-0	2	43'-0	2	46'-0	2	48'-0	2	50'-0	2	52'-0	2	54'-0	2	45'-0
t9	str					1	23'-0	2	33'-0	1	19'-0	2	22'-0	2	28'-0	2	24'-0	2	20'-0	2	20'-0
t10	str	1	42'-0	1	44'-0	1	46'-0	1	48'-0	1	50'-0	1	52'-0	1	54'-0	1	56'-0	1	58'-0	1	60'-0

QUANTITIES

	PIPE Dia.	REINF. Lbs.	CONCRETE C.Y.
RIGHT ANGLE	90°	255	4.9
	96°	300	5.7
	102°	335	6.5
	108°	400	7.3
	114°	450	8.1
	120°	500	9.1
	126°	590	10.2
	132°	650	11.3
	138°	735	12.3
	144°	780	13.4
15° SKEW	90°	270	5.2
	96°	320	6.0
	102°	365	6.6
	108°	395	7.5
	114°	450	8.4
	120°	525	9.3
	126°	595	10.4
	132°	660	11.6
	138°	720	12.5
	144°	780	13.6
30° SKEW	90°	385	6.5
	96°	430	8.3
	102°	485	9.0
	108°	530	9.9
	114°	600	10.7
	120°	645	11.7
	126°	720	12.8
	132°	780	13.8
	138°	845	14.8
	144°	925	15.9
45° SKEW	90°	500	9.8
	96°	580	10.7
	102°	640	11.6
	108°	705	12.6
	114°	735	13.6
	120°	815	14.7
	126°	900	16.0
	132°	965	17.2
	138°	1040	18.3
	144°	1140	19.7



BENDS

NOTE:
All reinforcing bars are #4.
The apron quantities take into consideration the cutoff walls being omitted along outlet headwalls.

NOTE:
For General Notes and additional Details, see SD 6.30 (1 of 5) and SD 6.36 (1 of 4).

NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	Original Issue	SAJA.	7-12
2			
3			
4			

DESIGN APPROVED: Shafi U. Hasan
APPROVED FOR DISTRIBUTION: Jean A. Nehme

ARIZONA DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION
BRIDGE GROUP STRUCTURE DETAIL

PIPE CULVERT HEADWALLS
OUTLET APRON STEEL LIST
6 : 1 SLOPE

ROUTE	PROJECT NO.	FA NO.	DRAWING NO.
			SD 6.36 (4 of 4)
LOCATION			SHEET NO. OF

22-JAN-2016 14:50 G:\Bridge\CADD\Standards\SD_Sheets\SD 6 Drainage Stuctures\SD 6.30 Series\SD636-1 to 4\sd636-4_0116.dgn