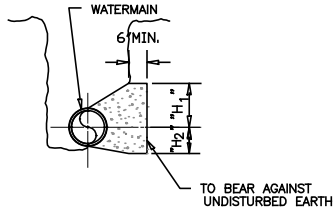
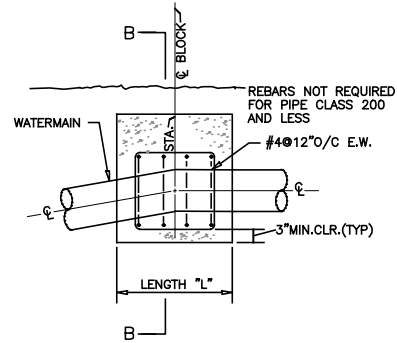


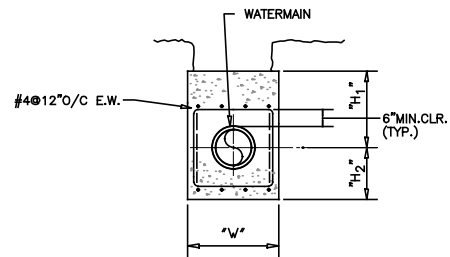
SECTIONAL PLAN



SECTION A-A



SECTIONAL ELEVATION



SECTION B-B

HORIZONTAL THRUST BLOCK					
PIPE DIA.	"H ₁ "	"H ₂ "	"L"	H.P.I. ANGLE (DEGREES)	
				CL. 150	GREATER THAN CL.150 UP TO CL.200
				MINIMUM DESIGN PIPELINE COVER	
6"φ & 8"φ	9"	9"	2'-0"	5'-21"	5'-16"
	9"	9"	4'-0"	22'-43"	17'-32"
	9"	9"	6'-0"	44'-67"	33'-49"
	2'-0"	1'-0"	5'-0"	68'-101"	50'-70"
	2'-0"	1'-3"	7'-0"		71'-105"
10"φ & 12"φ	1'-0"	1'-0"	2'-0"	5'-15"	5'-11"
	1'-0"	1'-0"	4'-0"	16'-31"	12'-23"
	1'-0"	1'-0"	6'-0"	32'-48"	24'-36"
	3'-0"	1'-6"	4'-0"	49'-58"	37'-42"
	3'-0"	1'-6"	6'-0"	59'-93"	43'-66"
14"φ & 16"φ	1'-6"	1'-6"	8'-0"		67'-93"
	1'-6"	1'-6"	2'-0"	3.5'	3.5'
	1'-6"	1'-6"	4'-0"	5'-15"	5'-11"
	1'-6"	1'-6"	6'-0"	16'-32"	12'-24"
	1'-6"	1'-6"	8'-0"	33'-49"	25'-36"
18"φ & 20"φ	3'-6"	1'-9"	6'-0"	50'-70"	37'-51"
	3'-6"	1'-9"	8'-0"	71'-100"	52'-70"
	3'-6"	1'-9"	10'-0"		71'-92"
	1'-6"	1'-6"	3'-0"	3.5'	3.5'
	1'-6"	1'-6"	4'-0"	4'-15"	4'-11"
21"φ & 24"φ	1'-6"	1'-6"	6'-0"	16'-32"	12'-23"
	4'-0"	2'-0"	5'-0"	33'-41"	24'-30"
	4'-0"	2'-0"	7'-0"	42'-59"	31'-43"
	4'-0"	2'-0"	9'-0"	60'-79"	44'-57"
	4'-0"	2'-0"	11'-0"	80'-102"	58'-71"
27"φ & 30"φ	4'-0"	2'-0"	13'-0"		72'-87"
	1'-6"	1'-6"	4'-0"	3.5'	3.5'
	1'-6"	1'-6"	8'-0"	3'-15"	3'-11"
	1'-6"	1'-6"	10'-0"	16'-30"	12'-22"
	4'-0"	2'-0"	8'-0"	31'-38"	23'-28"
33"φ & 36"φ	4'-0"	2'-0"	10'-0"	39'-48"	29'-36"
	4'-0"	2'-0"	12'-0"	49'-62"	37'-45"
	4'-0"	2'-0"	14'-0"	63'-76"	46'-55"
	4'-0"	2'-0"	16'-0"	77'-92"	56'-65"
	4'-0"	2'-0"	18'-0"		66'-76"
33"φ & 36"φ	4'-0"	2'-0"	21'-0"		77'-88"
	2'-0"	2'-0"	4'-0"	4.0'	4.0'
	2'-0"	2'-0"	8'-0"	3'-15"	3'-11"
	4'-6"	2'-3"	8'-0"	16'-30"	12'-22"
	4'-6"	2'-3"	10'-0"	31'-40"	23'-30"
33"φ & 36"φ	4'-6"	2'-3"	12'-0"	41'-51"	31'-38"
	4'-6"	2'-3"	14'-0"	52'-63"	39'-46"
	5'-0"	2'-6"	13'-0"	64'-75"	47'-54"
	5'-0"	2'-6"	15'-0"	76'-90"	55'-64"
	5'-0"	2'-6"	18'-0"		65'-79"
33"φ & 36"φ	5'-0"	2'-6"	21'-0"		80'-95"
	2'-0"	2'-0"	4'-0"	4.0'	4.5'
	2'-0"	2'-0"	8'-0"	3'-11"	3'-9"
	5'-0"	2'-6"	8'-0"	12'-22"	10'-18"
	5'-0"	2'-6"	10'-0"	23'-32"	19'-26"
33"φ & 36"φ	5'-0"	2'-6"	11'-0"	33'-45"	27'-37"
	5'-0"	2'-6"	14'-0"	46'-58"	38'-48"
	5'-0"	2'-6"	17'-0"	59'-72"	49'-59"
	5'-0"	2'-6"	20'-0"	73'-88"	60'-71"
	5'-6"	2'-9"	22'-0"		72'-86"

VERTICAL ANCHOR BLOCK						
PIPE DIA.	"H ₁ "	"H ₂ "	"W"	"L"	GRADE DIFFERENCE (%)	
					CL. 150	GREATER THAN CL.150 UP TO CL.200
6"φ & 8"φ	2'-0"	2'-0"	2'-0"	1'-6"	4%-24%	4%-17%
	2'-0"	2'-0"	2'-0"	2'-6"	25%-41%	18%-30%
	2'-0"	2'-0"	2'-0"	3'-6"	42%-63%	31%-43%
	2'-0"	2'-0"	2'-0"	5'-6"	64%-154%	44%-81%
	2'-0"	2'-0"	2'-0"	7'-0"		82%-130%
10"φ & 12"φ	2'-6"	2'-6"	3'-0"	2'-0"	4%-25%	4%-19%
	2'-6"	2'-6"	3'-0"	3'-0"	26%-40%	20%-29%
	2'-6"	2'-6"	3'-0"	4'-6"	41%-68%	30%-46%
	2'-6"	2'-6"	3'-0"	6'-6"	69%-141%	47%-77%
	3'-0"	3'-0"	3'-0"	7'-0"		78%-132%
14"φ & 16"φ	3'-0"	3'-0"	4'-0"	2'-0"	4%-23%	4%-17%
	3'-0"	3'-0"	4'-0"	3'-6"	25%-42%	18%-30%
	3'-0"	3'-0"	4'-0"	5'-0"	43%-67%	31%-46%
	3'-0"	3'-0"	4'-0"	7'-0"	68%-127%	47%-73%
	3'-0"	3'-0"	4'-0"	10'-0"		74%-157%
18"φ & 20"φ	3'-0"	3'-0"	4'-6"	3'-0"	4%-24%	4%-18%
	3'-0"	3'-0"	4'-6"	5'-0"	25%-42%	19%-30%
	3'-0"	3'-0"	4'-6"	7'-0"	43%-66%	31%-45%
	3'-0"	3'-0"	4'-6"	10'-0"	67%-128%	46%-73%
	3'-0"	3'-0"	4'-6"	13'-0"		74%-120%
21"φ & 24"φ	3'-0"	3'-0"	5'-0"	3'-0"	4%-18%	4%-13%
	3'-0"	3'-0"	5'-0"	5'-0"	19%-31%	14%-22%
	3'-0"	3'-0"	5'-0"	7'-0"	32%-45%	23%-32%
	3'-0"	3'-0"	5'-0"	9'-0"	46%-63%	33%-43%
	3'-0"	3'-0"	5'-0"	11'-0"	64%-85%	44%-56%
27"φ & 30"φ	3'-0"	3'-0"	5'-0"	14'-0"	86%-148%	57%-79%
	3'-6"	3'-6"	5'-0"	15'-0"		80%-129%
	3'-6"	3'-6"	6'-0"	3'-0"	4%-15%	4%-11%
	3'-6"	3'-6"	6'-0"	5'-0"	16%-27%	12%-20%
	3'-6"	3'-6"	6'-0"	7'-0"	28%-39%	21%-28%
33"φ & 36"φ	3'-6"	3'-6"	6'-0"	9'-0"	40%-53%	29%-37%
	3'-6"	3'-6"	6'-0"	11'-0"	54%-70%	38%-47%
	3'-6"	3'-6"	6'-0"	13'-0"	71%-93%	48%-59%
	3'-6"	3'-6"	6'-0"	15'-0"	94%-127%	60%-73%
	4'-0"	4'-0"	6'-0"	16'-0"		74%-101%
33"φ & 36"φ	4'-0"	4'-0"	6'-0"	18'-0"		102%-133%
	3'-6"	3'-6"	7'-0"	4'-0"	4%-17%	4%-12%
	3'-6"	3'-6"	7'-0"	6'-0"	18%-26%	13%-19%
	3'-6"	3'-6"	7'-0"	8'-0"	27%-35%	20%-26%
	3'-6"	3'-6"	7'-0"	10'-0"	36%-45%	27%-32%
33"φ & 36"φ	3'-6"	3'-6"	7'-0"	13'-0"	46%-63%	33%-44%
	4'-0"	4'-0"	7'-0"	14'-0"	64%-91%	45%-58%
	4'-0"	4'-0"	7'-0"	16'-0"	92%-120%	59%-71%
	4'-0"	4'-0"	7'-0"	18'-0"		72%-85%
	4'-0"	4'-0"	7'-0"	21'-0"		86%-116%

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY: *Sinnaro Yos*
Sinnaro Yos, P.E. C68607

THRUST BLOCKS FOR WELDED STEEL PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

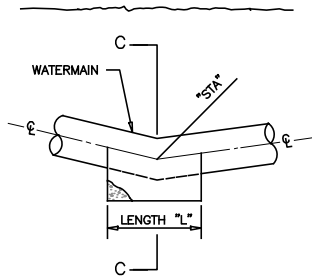
DRAWING NO.

C-2

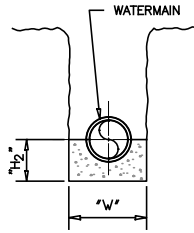
SHEET 1 OF 3

W.O. 19-0248

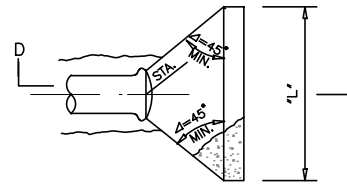
REV.



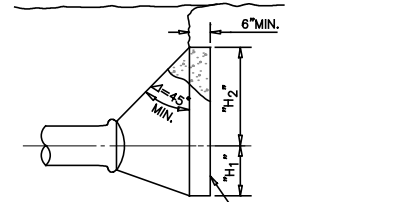
SECTIONAL ELEVATION



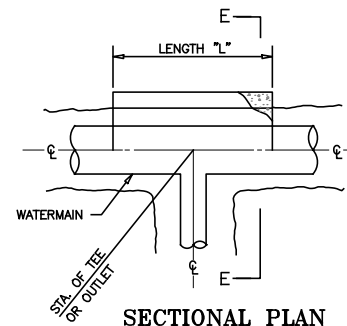
SECTION C-C



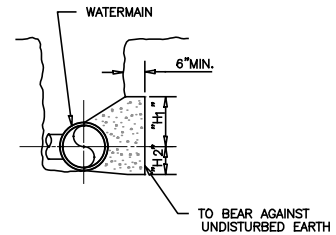
SECTIONAL PLAN



SECTION D-D



SECTIONAL PLAN



SECTION E-E

VERTICAL BEARER BLOCK						
PIPE DIA.	"H ₂ "	"W"	"L"	GRADE DIFFERENCE (%)		
				CL. 150	GREATER THAN CL.150 UP TO CL.200	
6"φ & 8"φ	1'-0"	2'-0"	0'-6"	4%-43%	4%-31%	
	1'-0"	2'-0"	1'-0"	44%-131%	32%-74%	
	1'-0"	2'-0"	1'-6"		75%-202%	
10"φ & 12"φ	1'-0"	2'-6"	1'-0"	4%-49%	4%-35%	
	1'-0"	2'-6"	1'-6"	50%-88%	36%-57%	
	1'-0"	2'-6"	2'-0"	89%-189%	58%-88%	
	1'-0"	2'-6"	2'-6"		89%-142%	
14"φ & 16"φ	1'-6"	3'-0"	1'-0"	4%-31%	4%-22%	
	1'-6"	3'-0"	1'-6"	32%-50%	23%-35%	
	1'-6"	3'-0"	2'-0"	51%-74%	36%-50%	
	1'-6"	3'-0"	3'-0"	76%-201%	51%-90%	
	1'-6"	3'-0"	4'-0"		91%-201%	
18"φ & 20"φ	1'-6"	3'-0"	1'-6"	4%-29%	4%-21%	
	1'-6"	3'-0"	2'-0"	30%-41%	22%-29%	
	1'-6"	3'-0"	2'-6"	42%-54%	30%-38%	
	1'-6"	3'-0"	3'-0"	55%-69%	39%-47%	
	1'-6"	3'-0"	4'-0"	70%-118%	48%-69%	
	1'-6"	3'-0"	5'-0"		70%-102%	
21"φ & 24"φ	1'-6"	3'-6"	1'-6"	4%-23%	4%-17%	
	1'-6"	3'-6"	2'-6"	24%-41%	18%-30%	
	1'-6"	3'-6"	3'-6"	42%-64%	31%-44%	
	1'-6"	3'-6"	4'-6"	65%-97%	45%-61%	
	1'-6"	3'-6"	5'-6"	98%-162%	62%-82%	
	1'-6"	3'-6"	7'-0"		83%-139%	
	2'-0"	4'-6"	2'-0"	4%-26%	4%-19%	
	2'-0"	4'-6"	3'-0"	27%-41%	20%-30%	
27"φ & 30"φ	2'-0"	4'-6"	4'-0"	42%-59%	31%-41%	
	2'-0"	4'-6"	5'-0"	60%-82%	42%-54%	
	2'-0"	4'-6"	6'-6"	83%-147%	55%-79%	
	2'-0"	4'-6"	7'-6"		80%-102%	
	2'-0"	4'-6"	8'-6"		103%-138%	
	2'-0"	5'-6"	2'-0"	4%-22%	4%-16%	
33"φ & 36"φ	2'-0"	5'-6"	3'-6"	23%-41%	17%-30%	
	2'-0"	5'-6"	5'-0"	42%-64%	31%-44%	
	2'-0"	5'-6"	6'-6"	65%-99%	45%-62%	
	2'-0"	5'-6"	8'-0"	100%-172%	63%-85%	
	2'-0"	5'-6"	9'-6"		86%-121%	

END THRUST BLOCK & TEE THRUST BLOCK					
PIPE DIA.	"H ₁ "	"H ₂ "	LENGTH "L"		
			CL.150	GREATER THAN CL.150 UP TO CL.200	
					MINIMUM DESIGN PIPELINE COVER
6"φ & 8"φ	2'-0"	1'-0"	2.5'	2.5'	
			3'-0"	4'-0"	
10"φ & 12"φ	2'-0"	1'-0"	3.0'	3.0'	
			5'-6"	7'-6"	
14"φ & 16"φ	3'-0"	1'-6"	3.5'	3.5'	
			6'-0"	8'-0"	
18"φ & 20"φ	3'-6"	1'-9"	3.5'	3.5'	
			7'-6"	10'-0"	
21"φ & 24"φ	4'-0"	2'-0"	3.5'	3.5'	
			9'-6"	12'-6"	
27"φ & 30"φ	4'-6"	2'-3"	4.0'	4.0'	
			11'-6"	15'-6"	
33"φ & 36"φ	5'-0"	2'-6"	4.0'	4.5'	
			14'-6"	17'-6"	

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

 Sinnaro Yos, P.E. C68607

THRUST BLOCKS FOR WELDED STEEL PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
 CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

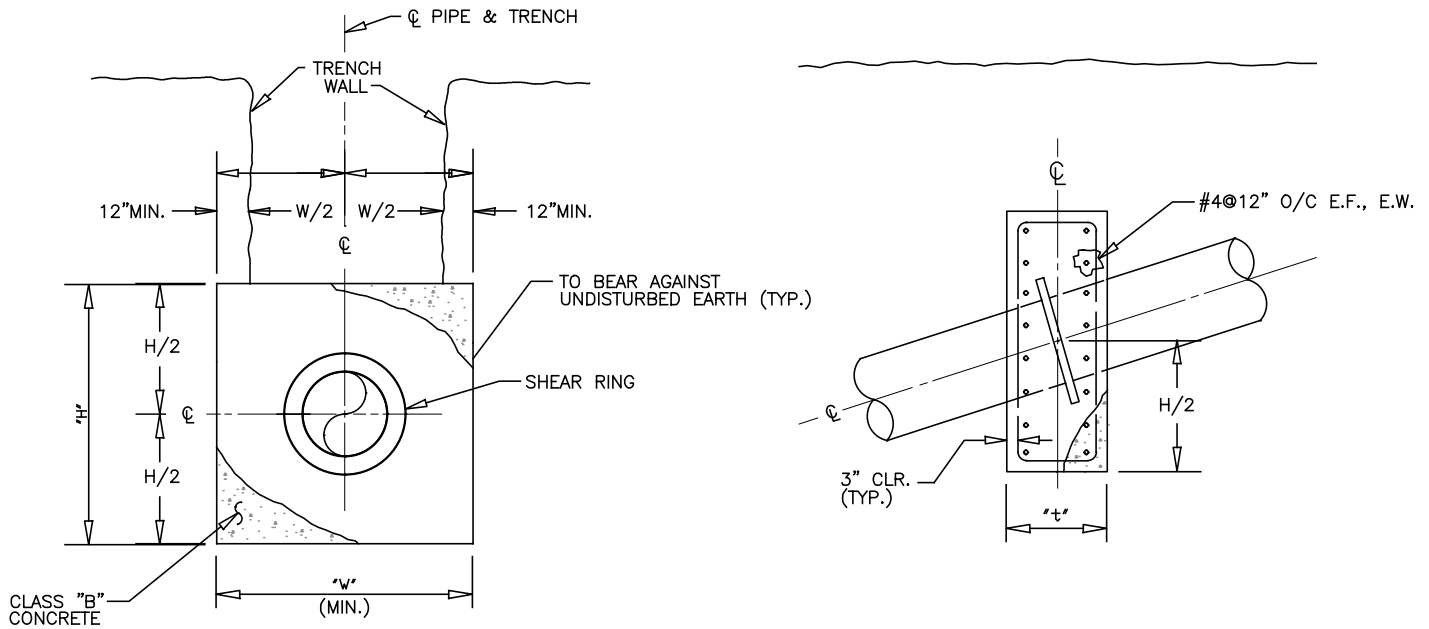
DRAWING NO.

C-2

SHEET 2 OF 3

W.O. 19-0248

REV.



PIPE DIA.	CL. 150			GREATER THAN CL.150 UP TO CL. 200		
	MINIMUM DESIGN		PIPELINE COVER	PIPELINE COVER		
	"H"	"W"		"H"	"W"	
6"φ & 8"φ	2'-6"	4'-6"	12"	2'-6"	5'-6"	12"*
10"φ & 12"φ	3'-6"	5'-6"	12"	3'-6"	7'-0"	12"*
14"φ & 16"φ	4'-0"	8'-0"	12"	4'-0"	9'-0"	15"*
18"φ & 20"φ	5'-0"	8'-6"	15"*	6'-0"	9'-0"	18"*
21"φ & 24"φ	6'-0"	9'-6"	21"*	7'-0"	10'-6"	21"*
27"φ & 30"φ	8'-0"	9'-6"	22"*	8'-6"	11'-6"	27"*
33"φ & 36"φ	9'-0"	11'-6"	24"*	10'-0"	12'-6"	30"*

* USE REBAR #4 @ 12" O/C E.F. & E.W.

NOTES:

- ALL THRUST BLOCKS SHALL BE A MINIMUM OF CLASS "C" CONCRETE (4.0 SACKS MIX) AS PER SPECIFICATIONS, EXCEPT SHEAR RING BLOCK WHICH SHALL BE A MINIMUM OF CLASS "B" CONCRETE (5.0 SACKS MIX).
- RE-BAR SHALL BE INTERMEDIATE GRADE DEFORMED BARS CONFORMING TO A.S.T.M. SPEC. A-15 & A-305.
- RE-BAR LAP LENGTH = 18" MIN. OR 36 x RE-BAR DIA., WHICHEVER IS GREATER.
- REBARS ARE REQUIRED FOR SHEAR RING BLOCKS AS NOTED.
- HORIZONTAL THRUST BLOCKS, TEE & END BLOCKS, & SHEAR RING BLOCKS.
 - THE ALLOWABLE LATERAL BEARING PRESSURE AGAINST UNDISTURBED EARTH (P_p) USED IN DESIGN OF BLOCKS IS 333 LBS./SQ. FT./FT. OF DEPTH.
 - THE ALLOWABLE LATERAL BEARING PRESSURE WAS DETERMINED BY USING THE MINIMUM DESIGN PIPELINE COVER AS SHOWN IN THE THRUST BLOCK TABLES.
 - THE TOTAL RESULTANT THRUST FOR HORIZONTAL ANGLES WAS DETERMINED USING THE RELATIONSHIP

$$HT = 2P \frac{T}{4} D^2 \sin \frac{\Delta}{2}$$
 WHERE HT= TOTAL HORIZONTAL THRUST, LBS.
 D= INSIDE DIAMETER, IN.
 P= INTERNAL PRESSURE, P.S.I.
 Δ= H.P.I., DEGREES.
- VERTICAL BEARING BLOCK & VERTICAL ANCHOR BLOCK,
 - THE ALLOWABLE FOUNDATION PRESSURE AGAINST UNDISTURBED EARTH (P_p) USED FOR DETERMINING THE REQUIRED BEARING BLOCK IS 3000 LBS./SQ.FT.
 - THE TOTAL RESULTANT THRUST FOR VERTICAL ANGLES WAS APPROXIMATED USING THE RELATIONSHIP

$$VT = P \frac{T}{4} D^2 \sin \Delta$$
 (Δ=TAN⁻¹ 9/100).
 WHERE VT= TOTAL VERTICAL THRUST, LBS.
 D= INSIDE PIPE DIAMETER, IN.
 P= INTERNAL PRESSURE, P.S.I.
 Δ= V.P.I., DEGREES.
 g= GRADE DIFFERENCE (%).

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

 Sinnaro Yos, P.E. C68607

THRUST BLOCKS FOR WELDED STEEL PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
 CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

C-2

SHEET 3 OF 3

W.O. 19-0248

REV.