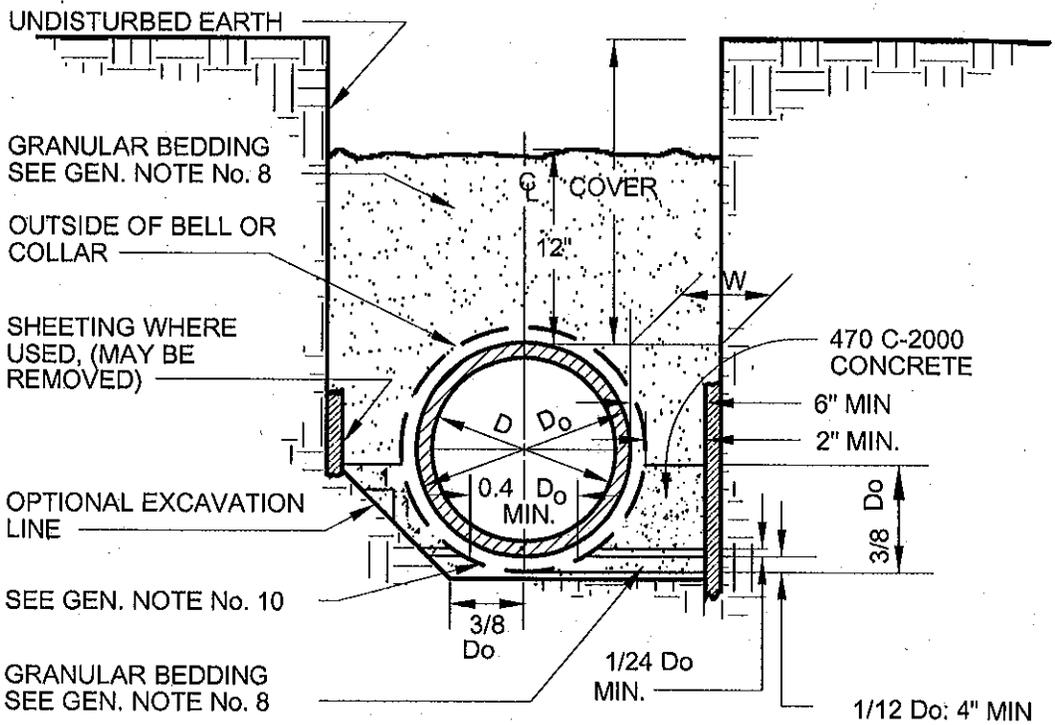


CASE I BEDDING
(LOAD FACTOR = 1.4)



CASE II BEDDING
(LOAD FACTOR = 2.1)

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PIPE LAYING IN TRENCHES

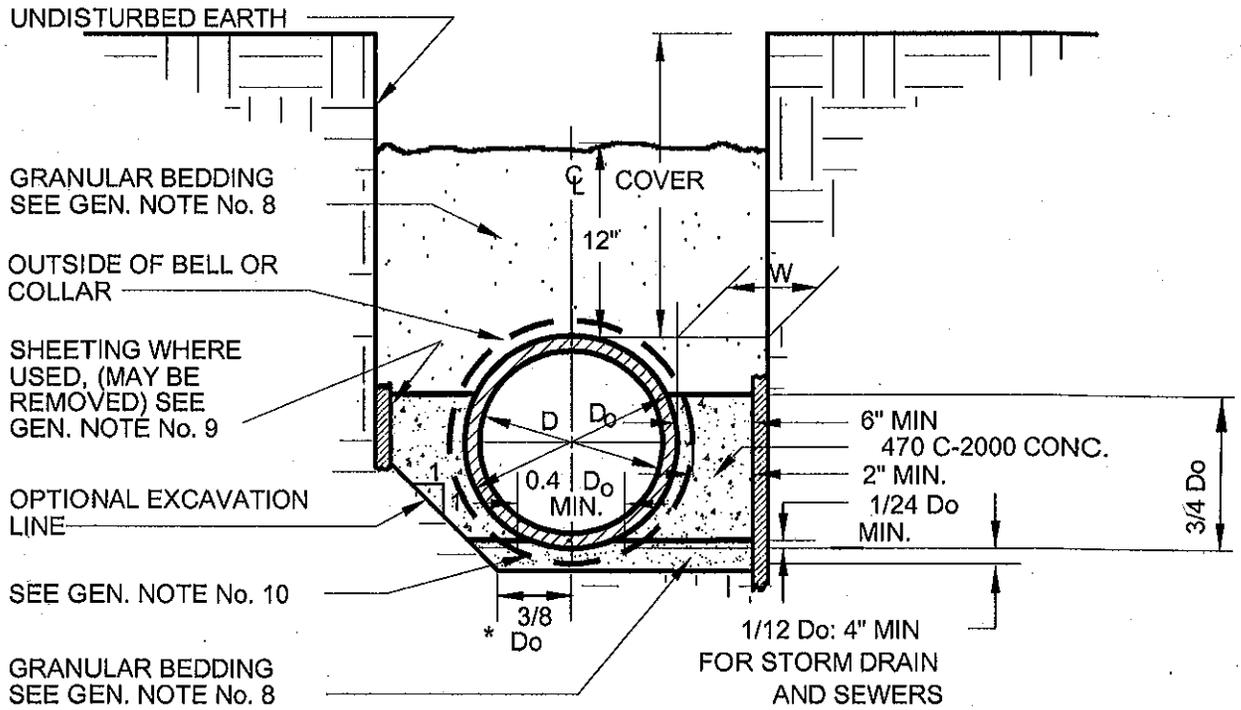
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PRINCIPAL CIVIL ENGINEER

APPROVED BY: *R. R. O.*
CITY ENGINEER R.C.E. 37064

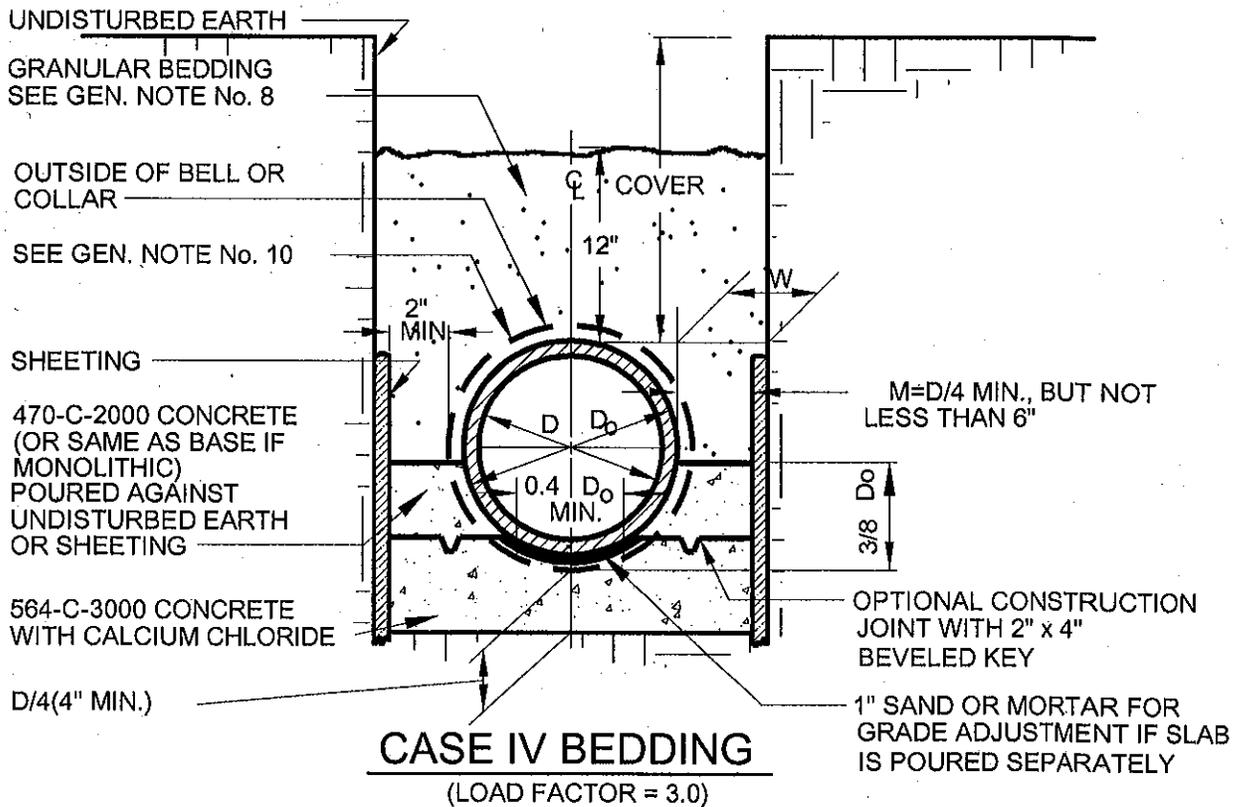
DATE *2/25/14*

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CASE III BEDDING

(LOAD FACTOR = 2.7)



CASE IV BEDDING

(LOAD FACTOR = 3.0)

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PIPE LAYING IN TRENCHES

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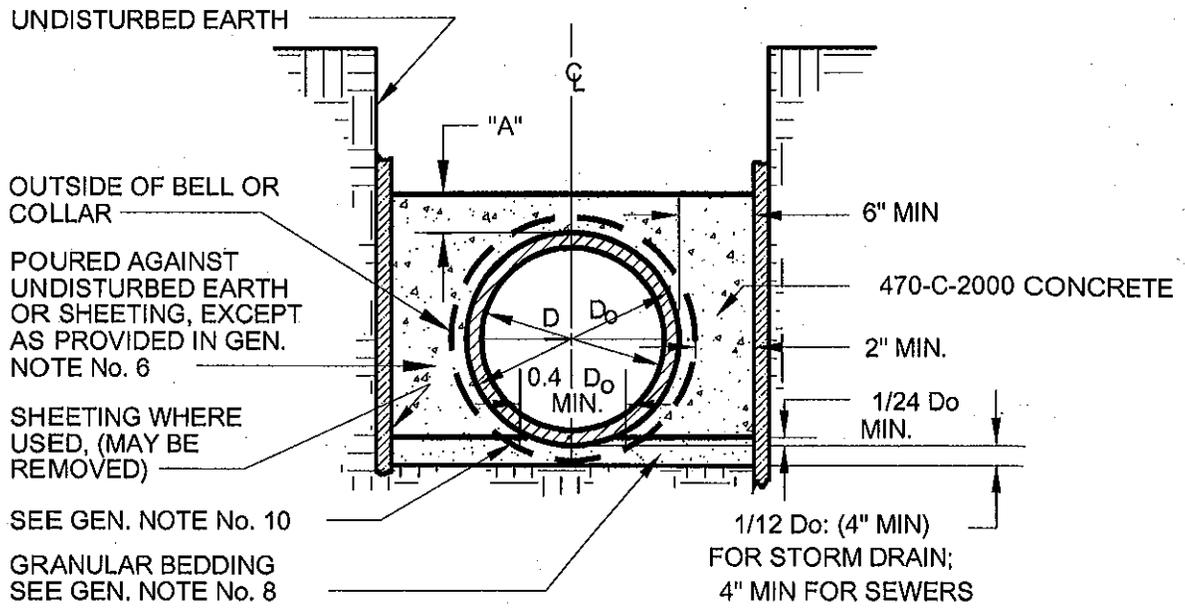
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PRINCIPAL CIVIL ENGINEER

APPROVED BY: *R. P. R.*
CITY ENGINEER R.C.E. 37064

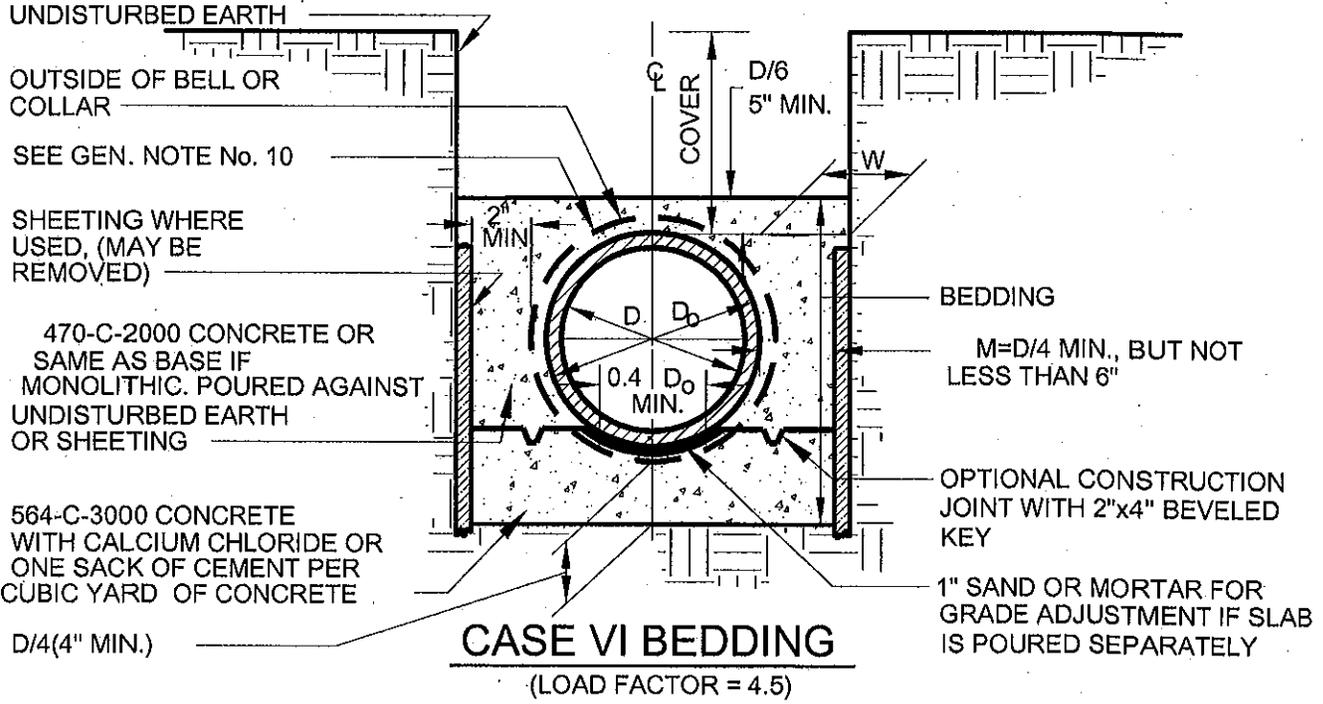
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CASE V BEDDING

PROTECTION FOR SHALLOW PIPES
(LOAD FACTOR = 2.8)



CASE VI BEDDING

(LOAD FACTOR = 4.5)

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PIPE LAYING IN TRENCHES

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APPROVED BY: *J. M. Derr*
PRINCIPAL CIVIL ENGINEER

APPROVED BY: *R. K. O.*
CITY ENGINEER R.C.E. 37064

DATE **2-25-14**

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GENERAL NOTES

1. UNLESS SHOWN OTHERWISE ON THE PLANS, THE PIPE BEDDING SHALL CONFORM TO CASE I BEDDING.
2. CASE I
 - A. WHERE THE COVER IS 8 FEET OR LESS, "W" HAS NO MAXIMUM LIMIT.
 - B. WHERE THIS CASE IS SPECIFIED AND THE COVER EXCEEDS 8 FEET, IF "W", MEASURED AT THE TOP OF THE PIPE EXCEEDS THE VALUE IN TABLE A, THE CONTRACTOR SHALL PROVIDE AT HIS SOLE EXPENSE THE BEDDING SHOWN IN TABLE B FOR THE INCREASED TRENCH WIDTH.
3. CASE II
 - A. WHERE THIS COVER IS 8 FEET OR LESS, "W" HAS NO MAXIMUM LIMIT.
 - B. WHERE THIS CASE IS SPECIFIED AND THE COVER EXCEEDS 8 FEET, IF "W", MEASURED AT THE TOP OF THE PIPE EXCEEDS THE VALUE IN TABLE A, THE CONTRACTOR SHALL PROVIDE AT HIS SOLE EXPENSE THE BEDDING SHOWN IN TABLE B FOR THE INCREASED TRENCH WIDTH.
4. CASE III
 - A. WHERE THE COVER IS 8 FEET OR LESS, "W" HAS NO MAXIMUM LIMIT.
 - B. WHERE THIS CASE IS SPECIFIED AND THE COVER EXCEEDS 8 FEET, IF "W", MEASURED AT THE TOP OF THE PIPE EXCEEDS THE VALUE IN TABLE A, THE CONTRACTOR SHALL PROVIDE AT HIS SOLE EXPENSE THE BEDDING SHOWN IN TABLE B FOR THE INCREASED TRENCH WIDTH.
5. CASE IV
 - A. WHERE THE COVER IS 8 FEET OR LESS, "W" HAS NO MAXIMUM LIMIT.

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APPROVED BY: J. H. DeWitt
PRINCIPAL CIVIL ENGINEER

APPROVED BY: [Signature]
CITY ENGINEER R.C.E. 37064

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GENERAL NOTES (CONT.)

5. CASE IV (CONT.)

B. WHERE THIS CASE IS SPECIFIED AND THE COVER EXCEEDS 8 FEET, THE MAXIMUM ALLOWABLE VALUE OF "W" GIVEN IN TABLE A SHALL APPLY EXCEPT THAT "W" MAY BE EXCEEDED TO EXTENT REQUIRED TO MAINTAIN THE MINIMUM DIMENSIONS SHOWN. IF THE MAXIMUM ALLOWABLE VALUE OF "W" MODIFIED AS PERMITTED ABOVE IS EXCEEDED ON ONE OR BOTH SIDES, THE CONTRACTOR SHALL PROVIDE AT HIS SOLE EXPENSE THE BEDDING SHOWN IN TABLE B FOR THE INCREASED TRENCH WIDTH.

C. WHERE THE ALLOWABLE TRENCH WIDTH IS UNLIMITED BY REASON OF THE COVER NOT EXCEEDING 8 FEET, OR AS INDICATED IN TABLE B, THE SECTION MAY BE FORMED.

6. CASE V

A. TRENCH WIDTH MAY BE ANY DIMENSION GREATER THAN THE MINIMUM INDICATED.

B. "A" DIMENSIONS

5" FOR D=45" OR LESS

6" FOR D=48" TO 72"

8" FOR D= GREATER THAN 72"

C. AT THE CONTRACTOR'S OPTION, THE CONCRETE PROTECTION MAY BE FORMED TO THE MINIMUM WIDTH SHOWN.

7. CASE VI

A. WHERE THE COVER IS 8 FEET OR LESS, "W" HAS NO MAXIMUM LIMIT.

B. WHERE THIS CASE IS SPECIFIED AND THE COVER EXCEEDS 8 FEET, THE MAXIMUM ALLOWABLE VALUE OF "W" GIVEN IN TABLE A SHALL APPLY EXCEPT THAT "W" MAY BE EXCEEDED TO THE EXTENT REQUIRED TO MAINTAIN THE MINIMUM DIMENSIONS SHOWN. IF THE MAXIMUM ALLOWABLE VALUE OF "W", MODIFIED AS PERMITTED ABOVE, IS EXCEEDED ON ONE OR BOTH SIDES, THE CONTRACTOR SHALL STRENGTHEN THE BEDDING AS ORDERED BY THE CITY ENGINEER.

C. WHERE THE ALLOWABLE TRENCH WIDTH IS UNLIMITED BY REASON OF THE COVER NOT EXCEEDING 8 FEET, OR AS INDICATED IN TABLE B, THE SECTION MAY BE FORMED.

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APPROVED BY: J. McDermott
PRINCIPAL CIVIL ENGINEER

APPROVED BY: R. K. O.
CITY ENGINEER R.C.E. 37064

DATE 2-25-12

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GENERAL NOTES (CONT.)

- 8. A. BEDDING MATERIALS:
 GRANULAR: SHALL BE SAND, GRAVEL, CRUSHED ROCK OR SUITABLE GRANULAR OR SANDY MATERIAL WITH A SAND EQUIVALENT GREATER THAN 20.

 B. CONCRETE: SHALL BE OF THE CLASS SHOWN.
- 9. IN SHEETED TRENCHES FOR CASE II AND III BEDDING, AT LEAST 50% OF THE EXTERIOR FACE OF THE CONCRETE BEDDING OVER ANY FIVE-FOOT LENGTH ON EITHER SIDE, SHALL BE POURED IN CONTACT WITH UNDISTURBED EARTH. OTHERWISE ENOUGH SHEETING SHALL BE CUT OFF AT THE TOP OF THE CONCRETE BEDDING AND LEFT IN PLACE SO THAT NOT LESS THAN 50% OF THE EXTERIOR FACE OF THE CONCRETE BEDDING OVER ANY FIVE-FOOT LENGTH ON EITHER SIDE SHALL BEAR AGAINST UNDISTURBED EARTH AND LEFT IN PLACE. ALTERNATIVELY, THE CONTRACTOR MAY ELECT, AT NO ADDITIONAL COST TO THE CITY, TO POUR CASE IV BEDDING AGAINST TRENCH SHEETING, WHICH MAY BE REMOVED, IN LIEU OF POURING THE CASE II OR III BEDDING AGAINST UNDISTURBED GROUND.
- 10. SUITABLE EXCAVATION SHALL BE MADE TO PREVENT THE PIPE BELL, COLLAR OR OTHER JOINT DETAIL PROJECTING OUTSIDE THE PIPE BARREL FROM BEARING UPON BEDDING MATERIAL, SUBGRADE OR CONCRETE WHEN LAID.
- 11. SUBSTITUTION OF BEDDING IN CLASSES OF EXCESS TRENCH WIDTH:

 A. WHERE THE MAXIMUM ALLOWABLE VALUE OF "W", SHOWN IN TABLE A AND MODIFIED BY NOTE No. 5-B, IS EXCEEDED DURING CONSTRUCTION ON ONE OR BOTH SIDES OF THE PIPE, THE CONTRACTOR SHALL SUBSTITUTE AN APPROPRIATE HIGHER TYPE OF BEDDING. THE SUBSTITUTE BEDDING SHALL BE THE TYPE FOR THE CONDITION INVOLVED AS SHOWN IN TABLE B.

 B. "TRENCH WIDTH RATIO", AS USED IN TABLE B, IS COMPUTED BY DIVIDING THE EFFECTIVE TRENCH WIDTH, $(D_o + 2W_t)$, BY THE MAXIMUM ALLOWABLE TRENCH WIDTH $(D_o + 2W)$,
 WHERE:
 D_o =OUTSIDE DIAMETER OF PIPES IN INCHES.
 W =ALLOWABLE VALUE IN INCHES, TABLE A.
 W_t = MAXIMUM DISTANCE, IN INCHES, FROM PIPE SIDE TO EXCAVATED BANK, MEASURED AT THE TOP OF THE PIPE.

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APPROVED BY: J. McDermott
PRINCIPAL CIVIL ENGINEER

APPROVED BY: R. R. R.
CITY ENGINEER R.C.E. 37064

DATE 2-25-14

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GENERAL NOTES (CONT.)

12. REMOVAL OF SHEETING:
SHEETING AGAINST WHICH CONCRETE IS TO BE POURED,
SHALL BE FACED WITH BUILDING PAPER IF THE SHEETING IS
TO BE REMOVED.
13. TRANSVERSE CONSTRUCTION JOINTS WITH 1-INCH OF
PREFORMED EXPANSION JOINT MATERIAL SHALL BE
PROVIDED IN CASE IV AND CASE VI BEDDING USED FOR CLAY
PIPE AND DUCTILE IRON PIPE. THE MAXIMUM SPACING OF THE
JOINTS SHALL BE 25 FEET FOR CLAY PIPE AND 36 FEET FOR
DUCTILE IRON PIPE. CONSTRUCTION JOINTS SHALL BE
LOCATED AT THE ENDS OF PIPE BELLS.
14. PAYMENT FOR WORK:
A. ALL COSTS ARISING FROM THE CONTRACTOR'S CHOICE OF
THE VARIOUS OPTIONAL DETAILS OF CONSTRUCTION SHOWN
HEREON SHALL BE CONSIDERED AS INCLUDED IN THE BID
PRICE FOR PIPE IN PLACE.

B. ANY ADDITIONAL COST OF CONSTRUCTING SUBSTITUTE
BEDDING IN THE CASE OF EXCESS TRENCH WIDTH SHALL BE
THE CONTRACTORS SOLE RESPONSIBILITY WITH NO
ADDITIONAL PAYMENT.
15. 3-EDGE BEARING TEST. LOAD FACTOR 1.0

CITY OF SAN BUENAVENTURA

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APPROVED BY: J. M. DeHoff
PRINCIPAL CIVIL ENGINEER

APPROVED BY: [Signature]
CITY ENGINEER R.C.E. 37064

DATE 2-25-14

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TABLE A : MAXIMUM VALUES OF "W" (INCLUDING SHEETING)			
INSIDE DIAMETER D	ALL OTHER PIPE	R.C.P. WITH BELLS OR COLLARS	R.C.P. NO BELLS OR COLLARS
6" - 10"	8"	16"	10"
12"	10"		
15" - 21"	12"		
24" - 42"	15"		
45" - 96"	X		
OVER 96"	X	16"	12"

TABLE B : SUBSTITUTE BEDDINGS												
CASE SPECIFIED ON PLANS	COVER*	PIPE SIZES	TRENCH WIDTH					RATIO***				
			1.00	1.10	1.20	1.25	1.30	1.35	1.50	1.55	1.60	NO LIMIT
I	8.1'-15'	TO - 60"	II								III	
		OVER 60	II									
	15.1'-20'	TO - 60"	II					III				IV
		OVER 60	II					III				
	20.1'-30'	TO - 60"	II					III		IV		VI
		OVER 60	II					III				IV
II	8.1'-15'	TO - 72"	III		IV						VI	
		OVER 72	III								IV	
	15.1'-20'	ALL SIZES	III		IV							VI
		ALL SIZES	III		IV							VI
	20.1'-30'	ALL SIZES	III		IV						VI	* *
		ALL SIZES	III		IV						VI	* *
III	8.1'-15'	ALL SIZES	IV								VI	
	15.1'-20'		IV								VI	
	20.1'-30'		IV			VI					* *	
IV	8.1'-15'	ALL SIZES									VI	
	15.1'-20'				VI						* *	
	20.1'-30'				VI						* *	

* SUBSTITUTE BEDDING, WHERE COVER EXCEEDS 30', SHALL BE AS ORDERED BY THE CITY ENGINEER.

** THE CONTRACTOR SHALL CONSTRUCT SPECIAL SUBSTITUTE BEDDING AS ORDERED BY THE CITY ENGINEER AT NO ADDITIONAL COST TO THE CITY.

*** TRENCH WIDTH RATIO IS PER GEN. NOTE 11B.

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APPROVED BY: *J. McDermott*
PRINCIPAL CIVIL ENGINEER

APPROVED BY: *R. R. R.*
CITY ENGINEER R.C.E. 37084

DATE 2-25-14

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