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## WATERFRONT DEVELOPMENT STANDARDS

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**CITY OF PUNTA GORDA**

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WATERFRONT  
DEVELOPMENT  
STANDARDS

STANDARD DETAIL

TABLE OF CONTENTS

PLATE NO. WD-1

JANUARY, 2015

**GENERAL NOTES:**

1. CONSTRUCTION SPECIFICATIONS: FLORIDA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", 2010 EDITION.
2. DESIGN SPECIFICATIONS: DESIGN SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
  - A. DESIGN SPECIFICATIONS: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LRFD BRIDGE DESIGN SPECIFICATIONS (2007 EDITION) AND 2008.
  - B. DESIGN METHOD: LIMIT STATES DESIGN METHOD (LOAD AND RESISTANCE FACTOR DESIGN).
  - C. U.S. ARMY CORPS OF ENGINEERS ENGINEERING MANUAL EM 1110-2-2504, DATED MARCH 1994.
  - D. ACI 318-05
3. MATERIAL STRESSES: ALL ALLOWABLE STRESSES ARE IN ACCORDANCE WITH THE AASHTO SPECIFICATIONS FOR THE MATERIALS SHOWN ON THE PLANS.
  - A. ALL CONCRETE SHALL CONFORM TO SECTION 346 OF THE SPECIFICATIONS AND SHALL BE CLASS IV, WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 5,500 PSI.
  - B. ALL REINFORCEMENT SHOWN IN DETAILS EXCEPT FOR TIE-BACKS SHALL BE LOW-CARBON, CORROSION-RESISTENT CHROMIUM STEEL REBAR, WHICH SHALL MEET THE SPECIFICATIONS AND STANDARD OF ASTM A1035 (LABELED IN DETAILS AS "MMFX") TIE-BACKS CAN BE EITHER MMFX (WHICH NEEDS TO BE ENCASED IN PVC FROM CONCRETE CAP TO DEADMAN) OR EPOXY COATED REBAR. EPOXY COATING SHALL BE "SCOTCHKOTE" BRAND EPOXY COATING RESIN #413 ASTM A775, ASTM A934, AND AASHTO M284.
4. SHEET PILE (SEAWALL) DESIGN CRITERIA:
  - A. THE SHEET PILE WALL WAS DESIGNED FOR THE DESIGN SECTION SHOWN IN PLATE NUMBER WD-8, SEAWALL CONSTRUCTION DETAILS. SHOULD THE WALL HEIGHT EXCEED THE MAXIMUM VALUE SHOWN IN THESE DETAILS OR IF THE BERM WIDTH IS LESS THAN THAT SHOWN IN THESE DETAILS, AN INDEPENDENT VERIFICATION OF WALL DETAILS WILL NEED TO BE PERFORMED BY THE ENGINEER.
  - B. NO SURCHARGE LIVE LOAD WAS CONSIDERED IN THE DESIGN OF THE SHEET PILE WALL. NO SURCHARGE SHALL BE APPLIED TO THE BACKSIDE OF THE WALL EITHER DURING CONSTRUCTION OR IN THE FINAL CONDITION. STRUCTURES CONSTRUCTED BEHIND THE BULKHEAD WALL SHALL BE FOUNDED ON SEPARATE DEEP FOUNDATIONS
  - C. THE MINIMUM PENETRATION DEPTH EQUALS 1.25 TIMES THE CALCULATED SERVICE LOAD PENETRATION. SEE PLATE NUMBER WD-8 SEAWALL CONSTRUCTION DETAILS SHEET FOR MINIMUM EMBEDMENT DIMENSIONS.
  - D. THE SEAWALL SYSTEM WAS DESIGNED FOR THE FOLLOWING MINIMUM SOIL VALUES. FIELD VERIFICATION OF THESE VALUES SHOULD BE PERFORMED FOR EACH WALL LOCATION. IF THE CITY'S ENGINEER CONSIDERS THE SOIL TYPES AT A SPECIFIC LOCATION TO BE OF LESSER STRENGTH PROPERTIES THAN THE VALUE SHOWN IN THESE NOTES, AN INDEPENDENT VERIFICATION OF WALL DETAILS WILL NEED TO BE PERFORMED BY THE CITY'S ENGINEER.
    - SATURATED UNIT WEIGHT = 115 pcf
    - MOIST UNIT WEIGHT = 105 pcf
    - ANGLE OF INTERNAL FRICTION = 28 DEGREES
    - ANGLE OF WALL FRICTION = 21 DEGREES
5. ENVIRONMENT: HIGHLY AGGRESSIVE.
6. SOIL PRECONDITIONING FOR CONCRETE SHEET PILING (SEAWALL): IN ORDER TO ACHIEVE THE REQUIRED SHEET PILE PENETRATIONS, IT IS EXPECTED THAT HARD MATERIALS WILL BE ENCOUNTERED WITHIN THE EMBANKMENT AND ROCK FORMATION. **THE CONTRACTOR WILL BE REQUIRED TO ACHIEVE THE MINIMUM PENETRATIONS REQUIRED IN THE PLANS** AND, IF NECESSARY, SHALL USE SPECIAL EQUIPMENT AND OR METHODS (DRILLING, AUGERING, PUNCHING, ETC.) TO FACILITATE THE PENETRATION OF THE SHEET PILES AS REQUIRED IN THE PLANS. PREDRILLING/PREFORMING SHALL BE PERFORMED IN SUCH A WAY THAT THE DENSE AND HARD MATERIALS ARE LOOSENED AND PENETRATED BUT NO SOIL IS EXTRACTED AND AN OPEN EXCAVATION IS NOT CREATED. **NO SEPARATE PAYMENTS SHALL BE MADE FOR SOIL PRECONDITIONING.**
7. COVER: CONCRETE COVER SHOWN IN THE PLANS DOES NOT INCLUDE REINFORCEMENT PLACEMENT AND FABRICATION TOLERANCES, UNLESS SHOWN AS "MINIMUM COVER". THE FOLLOWING MINIMUM CONCRETE COVER SHOULD BE PROVIDED:
  - PRECAST SHEET PILE PANELS = 2 1/2"
  - CAST IN PLACE SEAWALL CAP = 2 1/2" FOR EXTERNAL SURFACES
8. APPLIED FINISH: A SMOOTH TROWEL FINISH SHALL BE APPLIED TO THE WATER SIDE FACE OF THE CONCRETE SHEET PILING. A BROOM FINISH SHALL BE APPLIED TO THE SURFACES OF THE SEAWALL CAP IN ACCORDANCE WITH SECTION 400 OF THE SPECIFICATIONS.
9. CONSTRUCTION: THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES BEFORE DRIVING ANY SHEET PILING. ANY DISTURBANCE OR DAMAGE TO EXISTING STRUCTURES, UTILITIES OR OTHER PROPERTY, CAUSED BY THE CONTRACTORS OPERATION, SHALL BE REPAIRED BY THE CONTRACTOR IN A MANNER SATISFACTORY TO THE ENGINEER AT NO ADDITIONAL COST TO THE CITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE EQUIPMENT NECESSARY TO DRIVE THE SHEETING TO THE TIP ELEVATION(S) AS SPECIFIED ON THE PLANS. THE SHEET PILING SHALL BE DRIVEN, A MINIMUM, TO THE TIP ELEVATION(S) SPECIFIED, PRIOR TO COMMENCING ANY RELATED CONSTRUCTION. IF UNABLE TO REACH THE MINIMUM TIP ELEVATION, THE ADEQUACY OF THE SHEET PILING DESIGN WILL REQUIRE RE-EVALUATION BY THE CITY'S ENGINEER.
10. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE SHEET PILE WALLS DURING INSTALLATION UNTIL FILL IS PLACED TO FINAL GRADE. FILL SHALL BE PLACED IN AREAS AWAY FROM THE WALL PRIOR TO PLACING AGAINST THE SHEET PILES.
11. FLOATING TURBIDITY BARRIER AND SILT FENCE SHALL BE REQUIRED DURING THE CONSTRUCTION OF THE SEAWALLS.
12. EXPANSION, LOAD TRANSFER, AND CONTRACTION JOINTS SHALL BE INSTALLED AS SHOWN ON WD-5, AND WD-6.
13. SWALE RESTORATION: REGRADE ROADSIDE SWALE TO CITY SPECIFICATIONS AND SOD ENTIRE LIMITS OF DISTURBED AREAS. INCLUDES REPLACEMENT LOCATIONS AND STAGING SITES.
14. SOD/SEEDING REQUIREMENTS AT VACANT LOTS AND EXISTING RESIDENCE:
  - A. VACANT LOTS - THE DISTURBED PORTIONS OF A VACANT LOT OR PROPERTY SHALL BE SODDED WITH ARGENTINE BAHIA. NO EXPOSED SOILS SHALL BE PERMITTED. ALL RIGHTS-OF-WAY, DRAINAGE AREAS ALONG SIDE YARDS, AND PROPERTY WITHIN SIX (6) FEET OF THE SEAWALL SHALL BE SODDED COMPLETELY. THE REMAINDER OF THE LOT OR PROPERTY MAY BE STABILIZED BY SODDING COMPLETELY OR THE COMBINED USE OF STRIP SODDING AND SEEDING/MULCHING PROVIDED EACH ROW OF SOD IS SEPARATED BY NO MORE THAN 12 INCHES. IN ALL CASES, A MINIMUM 32 INCH WIDE STRIP OF EXISTING GRASS OR NEWLY PLACED SOD SHALL FORM THE PERIMETER OF ALL DISTURBED AREAS WITHIN THE PARCEL.
  - B. EXISTING RESIDENCE - ALL DISTURBED AREAS SHALL BE COMPLETELY SODDED WITH SOD THAT MATCHES EXISTING.

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STANDARD DETAIL

GENERAL NOTES

PLATE NO. WD-2

JULY, 2015

REBAR SCHEDULE FOR 10' SEAWALL PANEL

QTY	LENGTH (FT)	SIZE	SHAPE	WEIGHT (LBS)
10	5.5	#4	STRAIGHT	36.74
2	9.75	#4	STRAIGHT	13.03
2	20.60	#5	HAIRPIN (12" DIA.)	42.97

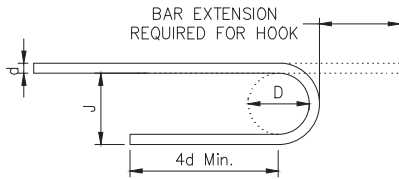
REBAR SCHEDULE FOR 12.5' SEAWALL PANEL

QTY	LENGTH (FT)	SIZE	SHAPE	WEIGHT (LBS)
13	5.5	#4	STRAIGHT	47.76
5	12.25	#4	STRAIGHT	40.92
2	25.55	#5	HAIRPIN (7.5" DIA.)	53.30

REBAR SCHEDULE FOR 14' SEAWALL PANEL

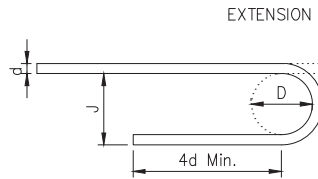
QTY	LENGTH (FT)	SIZE	SHAPE	WEIGHT (LBS)
14	5.5	#4	STRAIGHT	51.44
8	13.67	#4	STRAIGHT	73.05
2	28.31	#5	HAIRPIN (5.75" DIA.)	59.05

**REBAR SCHEDULE**



D = 6d FOR BARS #3 to #8  
D = 8d FOR BARS #9 to #11

BAR SIZE (d)	BAR EXTEN.	J
#2	4"	2"
#3	5"	3"
#4	6"	4"
#5	7"	5"
#6	8"	6"
#7	10"	7"
#8	11"	8"
#9	1'-3"	11 1/4"
#10	1'-5"	1'-0 3/4"
#11	1'-7"	1'-2 1/4"



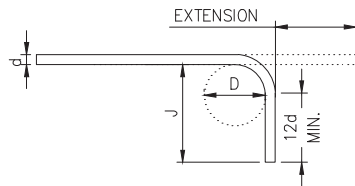
D = 5d MIN.  
D = 5d MAX.

NOTE:  
MINIMUM SIZE HOOKS TO BE USED ONLY FOR SPECIAL CONDITIONS

BAR SIZE (d)	BAR EXTEN.	J
#2	4"	1 3/4"
#3	5"	2 3/4"
#4	5"	3 1/4"
#5	6"	4 1/4"
#6	7"	5 1/4"
#7	9"	6"
#8	10"	7"
#9	11"	8"
#10	1'-1"	9"
#11	1'-2"	10"

RECOMMENDED SIZES - 180° HOOK

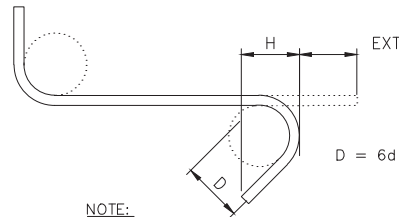
MINIMUM SIZES - 180° HOOK



D = 6d FOR BARS #3 to #8  
D = 8d FOR BARS #9 to #11  
D = 10d FOR BARS #14 to #18

BAR SIZE (d)	BAR EXTEN.
#2	3 1/2"
#3	6"
#4	8"
#5	10"
#6	1'-0"
#7	1'-2"
#8	1'-4"
#9	1'-7"
#10	1'-10"
#11	2'-0"

RECOMMENDED MINIMUM SIZES - 90° HOOK



BAR SIZE (d)	BAR EXTEN.
#2	3 1/2"
#3	4"
#4	4 1/2"
#5	5 1/2"

NOTE:  
STIRRUP HOOKS MAY BE BENT TO THE DIAMETER OF THE SUPPORTING BARS.

RECOMMENDED SIZES - 135° HOOK

**STANDARD HOOK DETAILS**

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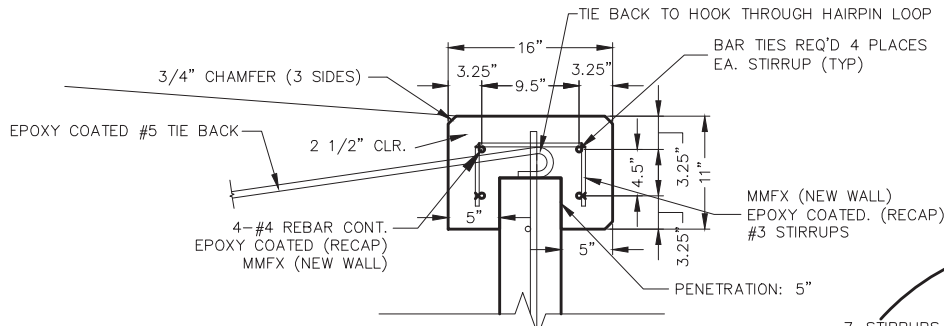
WATERFRONT  
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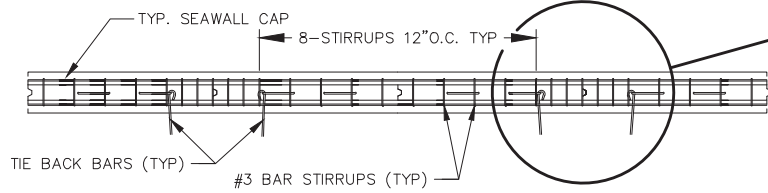
REBAR DETAILS

PLATE NO. WD-3

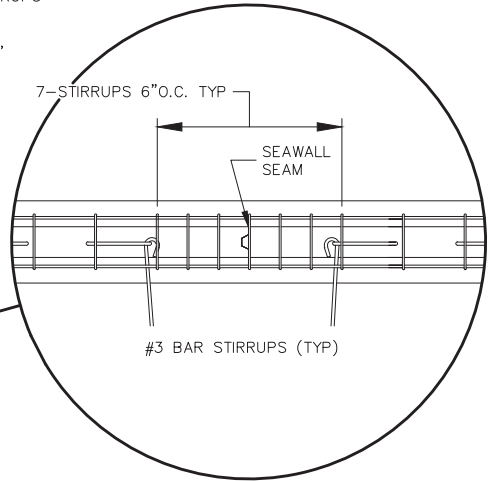
JANUARY, 2015



**TYPICAL CAP SECTION**  
N.T.S.



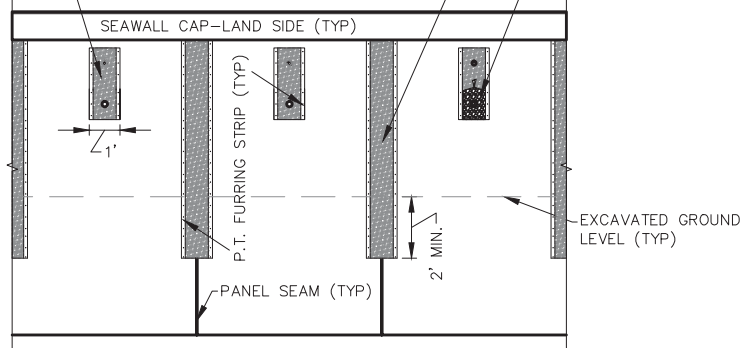
**TYPICAL STIRRUP LAY OUT**  
N.T.S.



12" WIDE STRIP OF FILTER FABRIC ATTACHED WITH P.T. 1"x2" FURRING STRIP MATERIAL TO LAND SIDE OF EVERY PANEL SEAM 24" MIN. BELOW GROUND OF WATERSIDE BERM (TYP)

12" WIDE STRIP OF FILTER FABRIC ATTACHED WITH P.T. 1"x2" FURRING STRIP MATERIAL TO LAND SIDE OF PANEL-COVER EA. WEEP HOLE (TYP)

#57 STONE IN 14" x 26" SAND BAG @ BOTTOM WEEP HOLE (TYP)



**ELEVATION VIEW (LAND SIDE) - FILTER FABRIC DETAIL**  
N.T.S.

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WATERFRONT  
DEVELOPMENT  
STANDARDS

STANDARD DETAIL

SEAWALL CAP AND  
FILTER FABRIC DETAILS

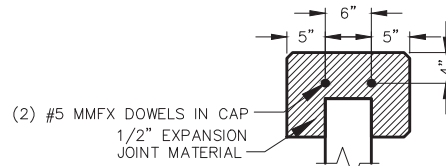
PLATE NO. WD-4

JANUARY, 2015

NOTE:  
 EXPANSION JOINTS SHALL BE PLACED APPROX  
 80-85 FEET O.C. NEAR THE PROPERTY  
 LINE(S). CONTRACTION JOINTS TO BE PLACED  
 MIDWAY BETWEEN EXPANSION JOINTS.

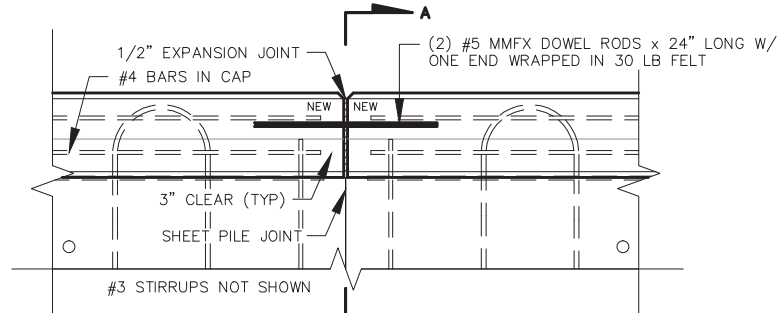
ALL EXPANSION JOINTS TO BE PLACED  
 AT/OVER THE SHEET PILE JOINT

SEE SHEET WD-5



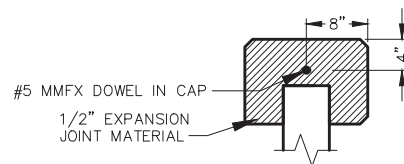
**SECTION A-A**

N.T.S.



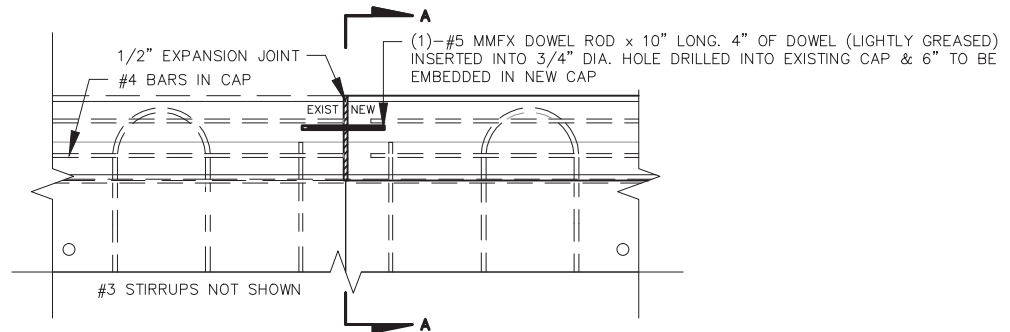
**EXPANSION JOINT AND DOWEL DETAIL**

N.T.S.



**SECTION A-A**

N.T.S.



**LOAD TRANSFER AND EXPANSION JOINT  
 CONNECTION TO EXISTING CAP**

N.T.S.

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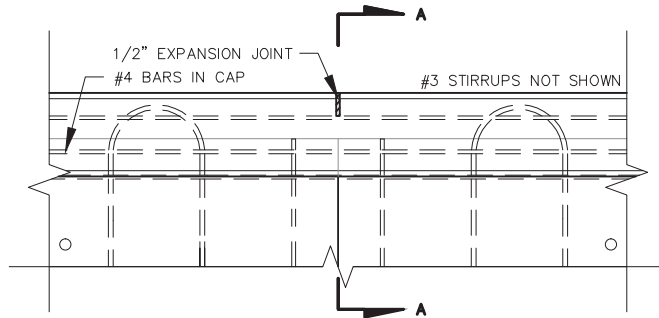
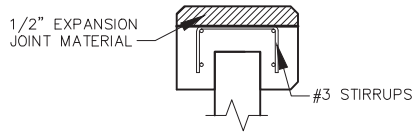
WATERFRONT  
 DEVELOPMENT  
 STANDARDS

STANDARD DETAIL

EXPANSION JOINT AND  
 LOAD TRANSFER DETAILS

PLATE NO. WD-5

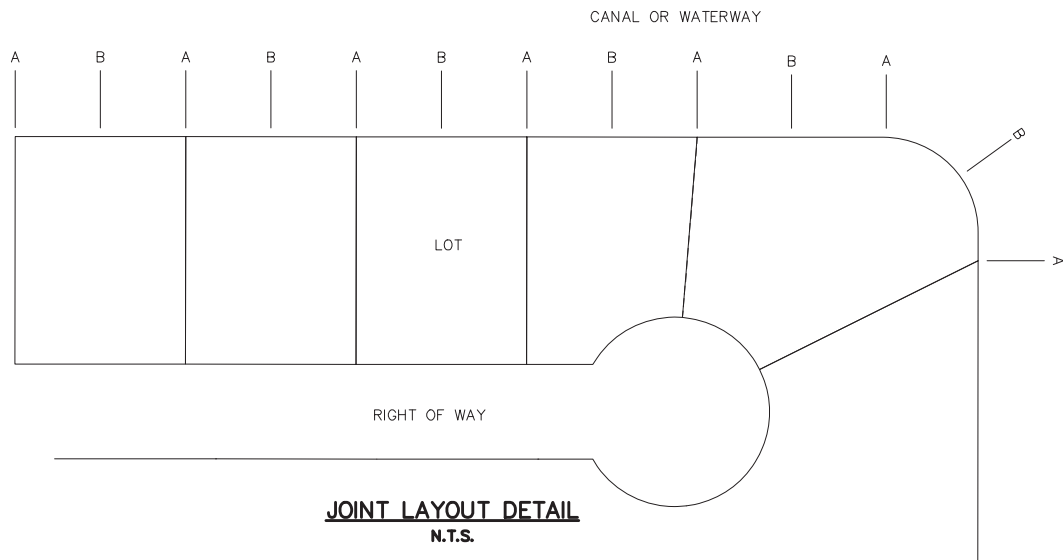
JANUARY, 2015



NOTE:  
EXPANSION JOINTS SHALL BE PLACED APPROX 80-85 FEET O.C. NEAR THE PROPERTY LINE(S). CONTRACTION JOINTS TO BE PLACED MIDWAY BETWEEN EXPANSION JOINTS.

ALL EXPANSION JOINTS TO BE PLACED AT/OVER THE SHEET PILE JOINT

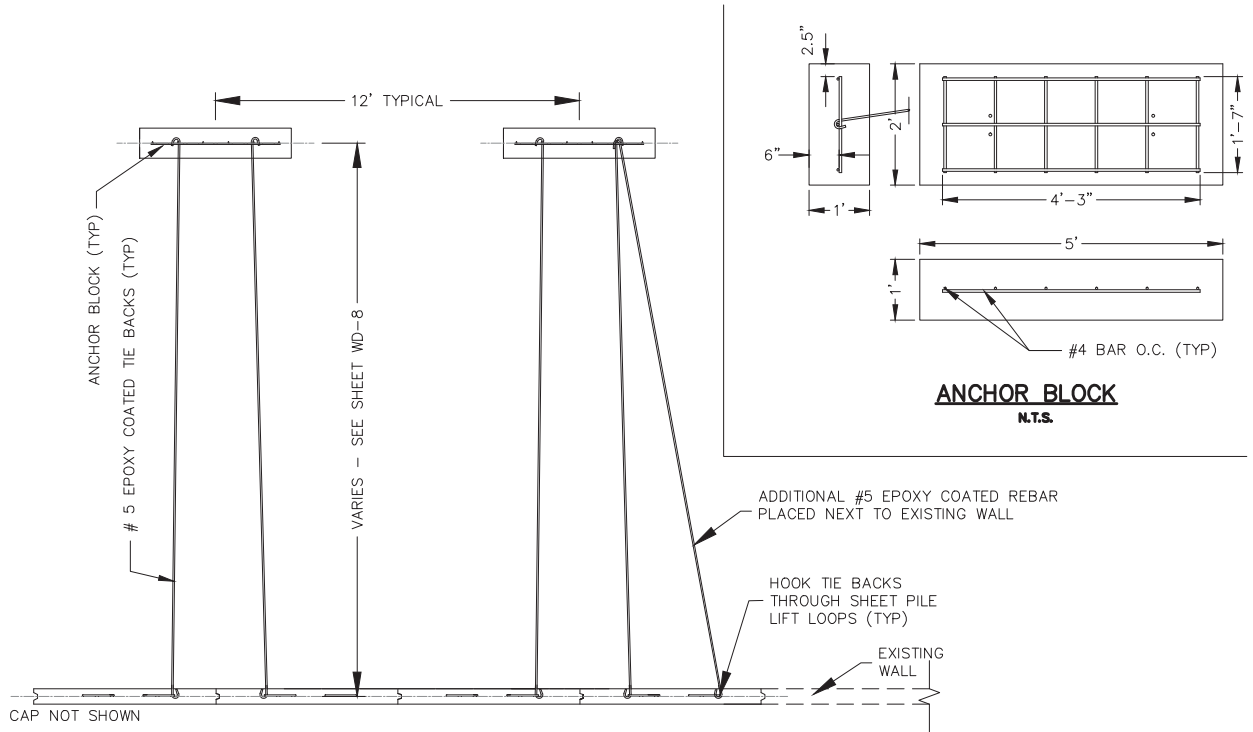
JOINT LEGEND	
A-	EXPANSION JOINT AND/OR LOAD TRANSFER PER DETAIL
B-	CONTRACTION JOINT PER DETAIL



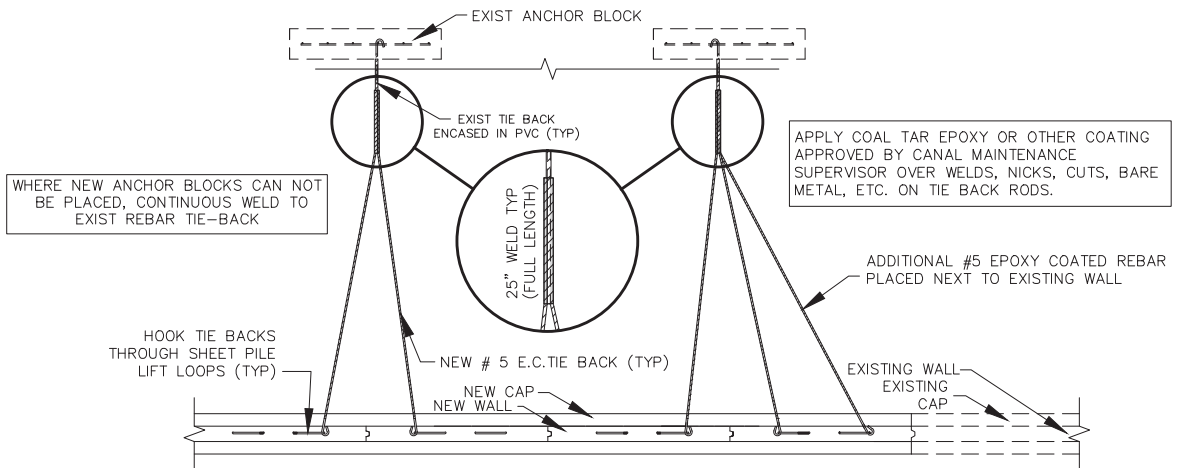
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WATERFRONT  
DEVELOPMENT  
STANDARDS

STANDARD DETAIL	
CONTRACTION JOINT DETAILS / JOINT LAYOUT	
PLATE NO. WD-6	JANUARY, 2015



**TYPICAL TIE BACK AT VACANT / OPEN LOT**  
N.T.S.



**TIE BACK BAR DETAIL OCCUPIED LOT**  
N.T.S.

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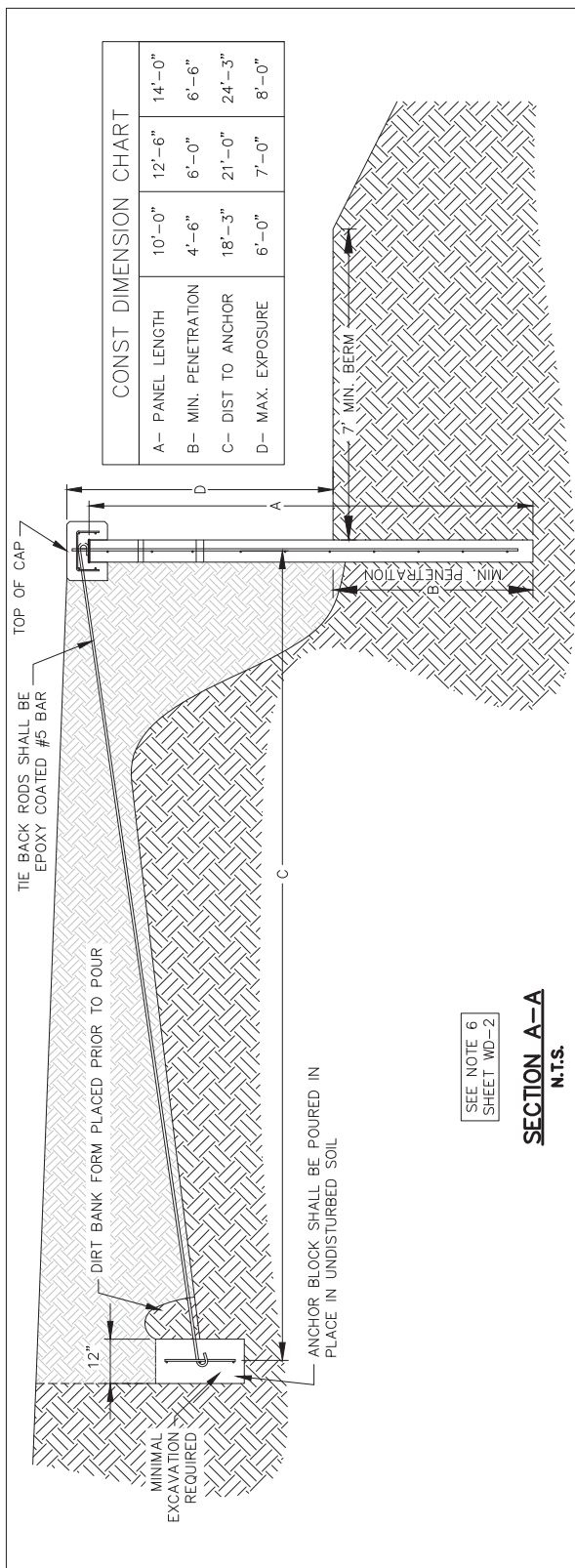
WATERFRONT  
DEVELOPMENT  
STANDARDS

STANDARD DETAIL

TIE BACK DETAILS

PLATE NO. WD-7

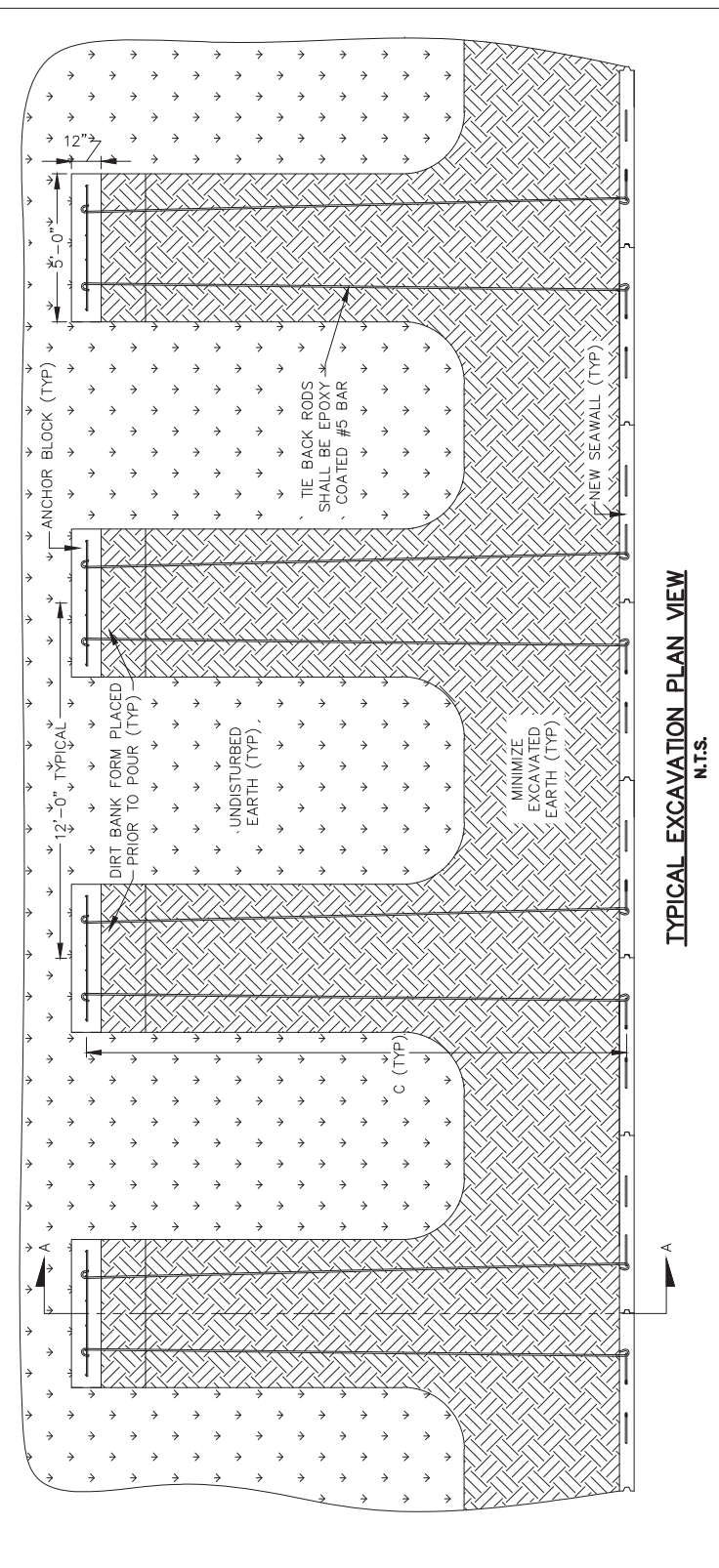
JANUARY, 2015



CONST DIMENSION CHART

A- PANEL LENGTH	10'-0"	12'-6"	14'-0"
B- MIN. PENETRATION	4'-6"	6'-0"	6'-6"
C- DIST TO ANCHOR	18'-3"	21'-0"	24'-3"
D- MAX. EXPOSURE	6'-0"	7'-0"	8'-0"

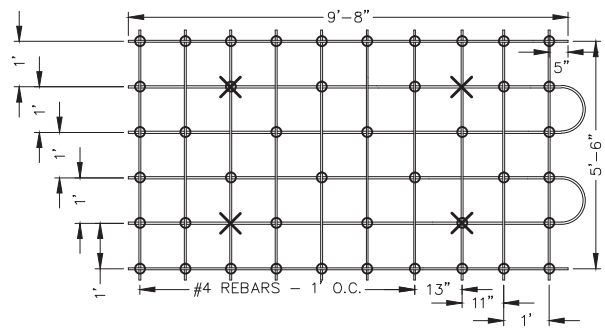
SEE NOTE 6  
 SHEET WD-2  
**SECTION A-A**  
 N.T.S.



**TYPICAL EXCAVATION PLAN VIEW**  
 N.T.S.



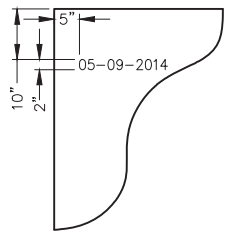
TIE LOCATION = ○  
CHAIR LOCATION = ×



**REBAR PLAN**  
N.T.S.

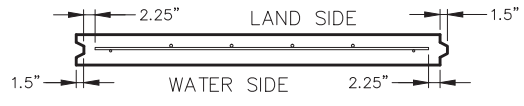
DATE STAMP DETAILS TYPICAL FOR ALL SHEET PILE LENGTHS

PANELS MUST BE STAMPED AS SHOWN  
USING A COMMERCIALY AVAILABLE  
CONCRETE STAMP SYSTEM.  
NUMBERS ARE 2" TALL x 1/2" DEEP  
FONT IS ARIAL BOLD. DISPLAY = 2 DIGITS  
FOR DAY, 2 DIGITS FOR MONTH  
4 DIGITS FOR YEAR, WITH DASH BETWEEN



DATE STAMP DETAILS TYPICAL  
FOR ALL SHEET PILE LENGTHS

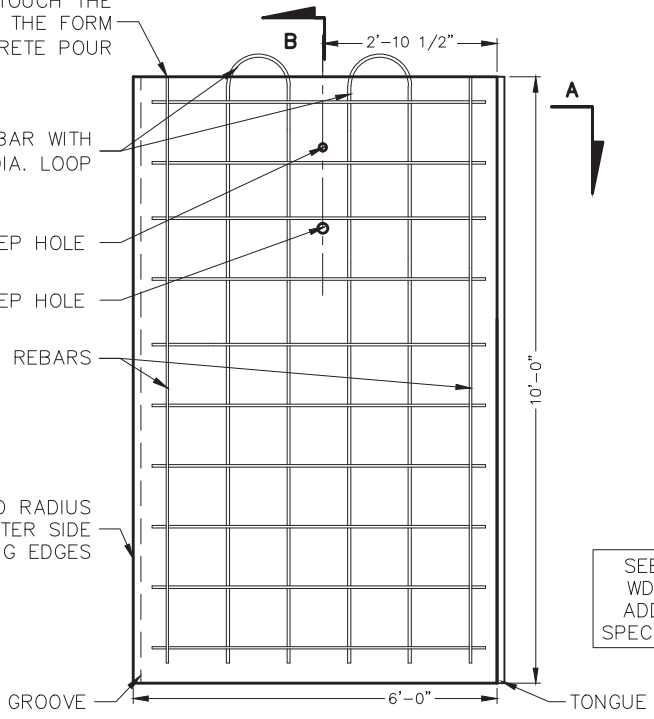
**DATE STAMP DETAILS**  
N.T.S.



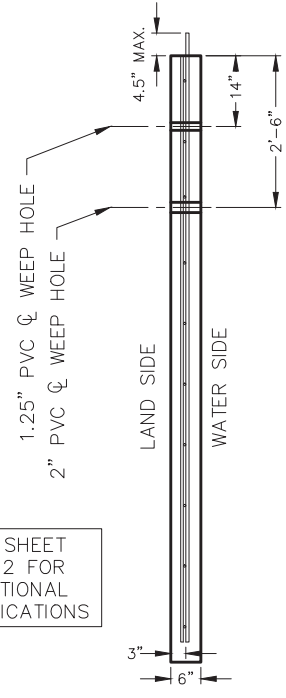
**SECTION A-A**  
N.T.S.

REBAR MAT SHALL TOUCH THE  
HEAD BOARD OF THE FORM  
PRIOR/DURING CONCRETE POUR

- #5 MMFX REBAR WITH 1'-0" DIA. LOOP
- 1.25" DIA. PVC WEEP HOLE
- 2" DIA. PVC WEEP HOLE
- (2) #4 MMFX REBARS
- 1/2" TOOLED RADIUS ON ALL WATER SIDE FACING EDGES



**TYPICAL SHEET PILE**  
N.T.S.



**SECTION B-B**  
N.T.S.

SEE SHEET  
WD-2 FOR  
ADDITIONAL  
SPECIFICATIONS

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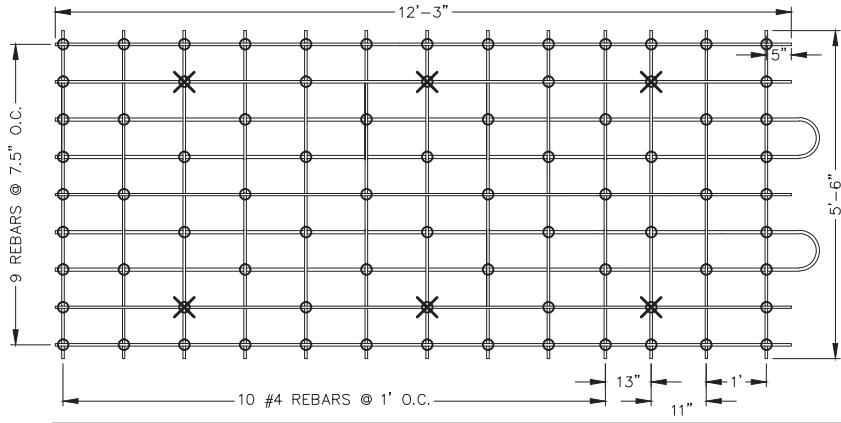
WATERFRONT  
DEVELOPMENT  
STANDARDS

STANDARD DETAIL

10'-0" PRECAST  
SEAWALL DETAILS

PLATE NO. WD-9

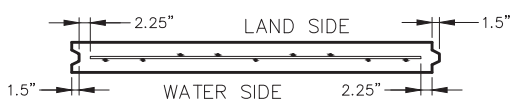
JANUARY, 2015



DATE STAMP DETAILS TYPICAL FOR ALL SHEET PILE LENGTHS SEE SHEET WD-9

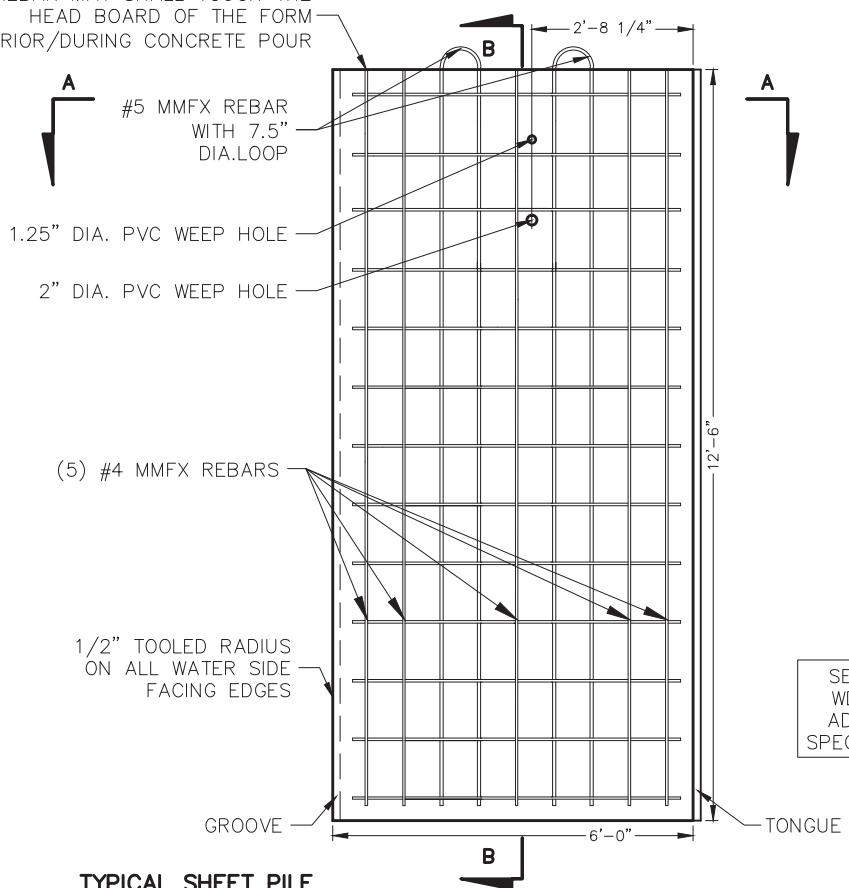
TIE LOCATION = ○  
CHAIR LOCATION = X

**REBAR PLAN**  
N.T.S.

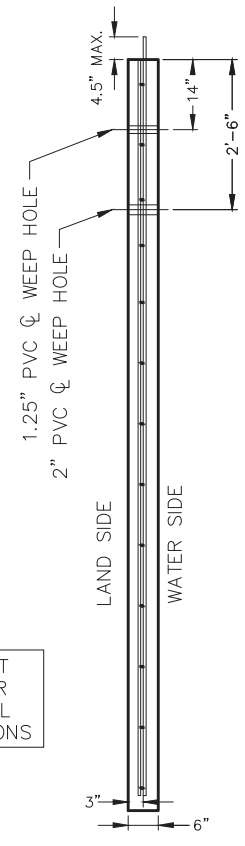


**SECTION A-A**  
N.T.S.

REBAR MAT SHALL TOUCH THE HEAD BOARD OF THE FORM PRIOR/DURING CONCRETE POUR



**TYPICAL SHEET PILE**  
N.T.S.



**SECTION B-B**  
N.T.S.

SEE SHEET WD-2 FOR ADDITIONAL SPECIFICATIONS

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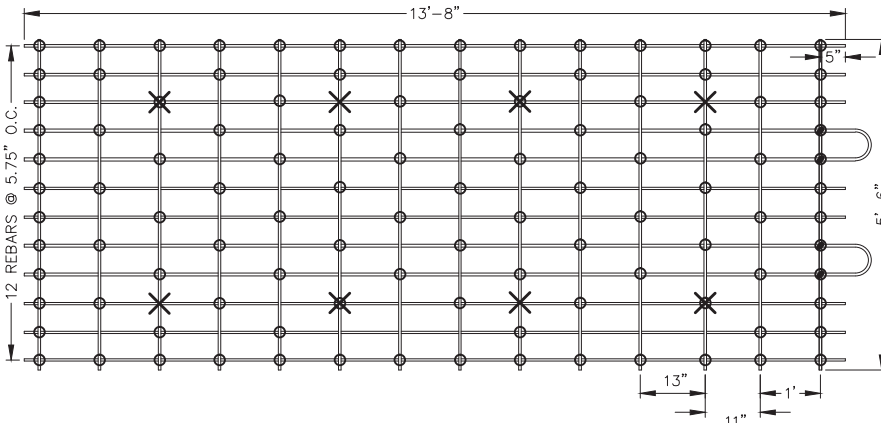
WATERFRONT  
DEVELOPMENT  
STANDARDS

STANDARD DETAIL

12'-6" PRECAST  
SEAWALL DETAILS

PLATE NO. WD-10

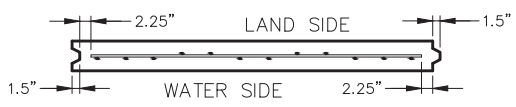
JANUARY, 2015



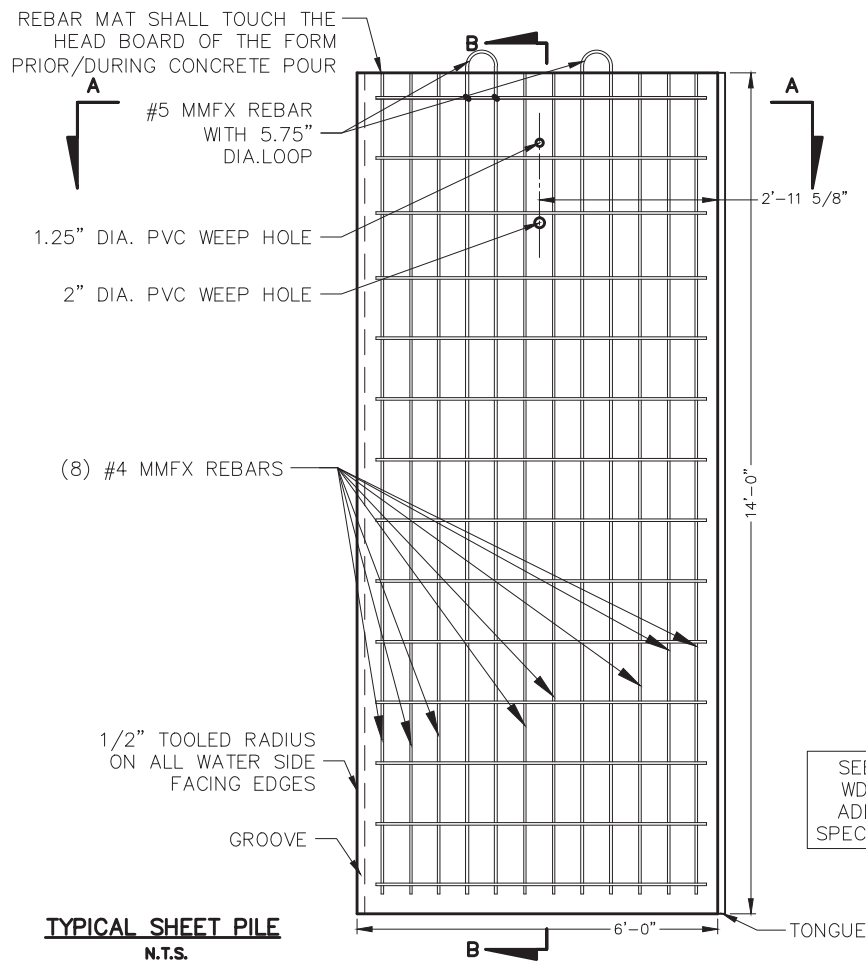
DATE STAMP DETAILS TYPICAL FOR ALL SHEET PILE LENGTHS SEE SHEET WD-9

TIE LOCATION = ○  
CHAIR LOCATION = ×

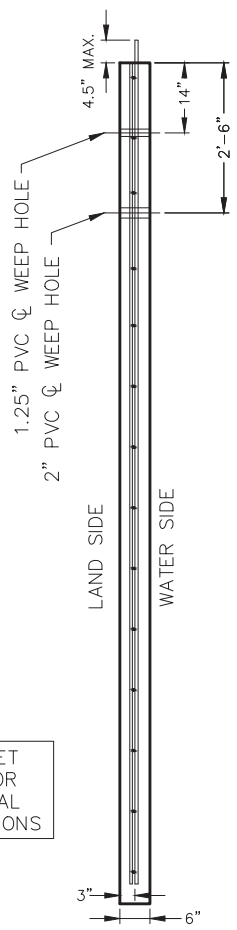
**REBAR PLAN**  
N.T.S.



**SECTION A-A**  
N.T.S.



**TYPICAL SHEET PILE**  
N.T.S.



SEE SHEET WD-2 FOR ADDITIONAL SPECIFICATIONS

**SECTION B-B**  
N.T.S.

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WATERFRONT  
DEVELOPMENT  
STANDARDS

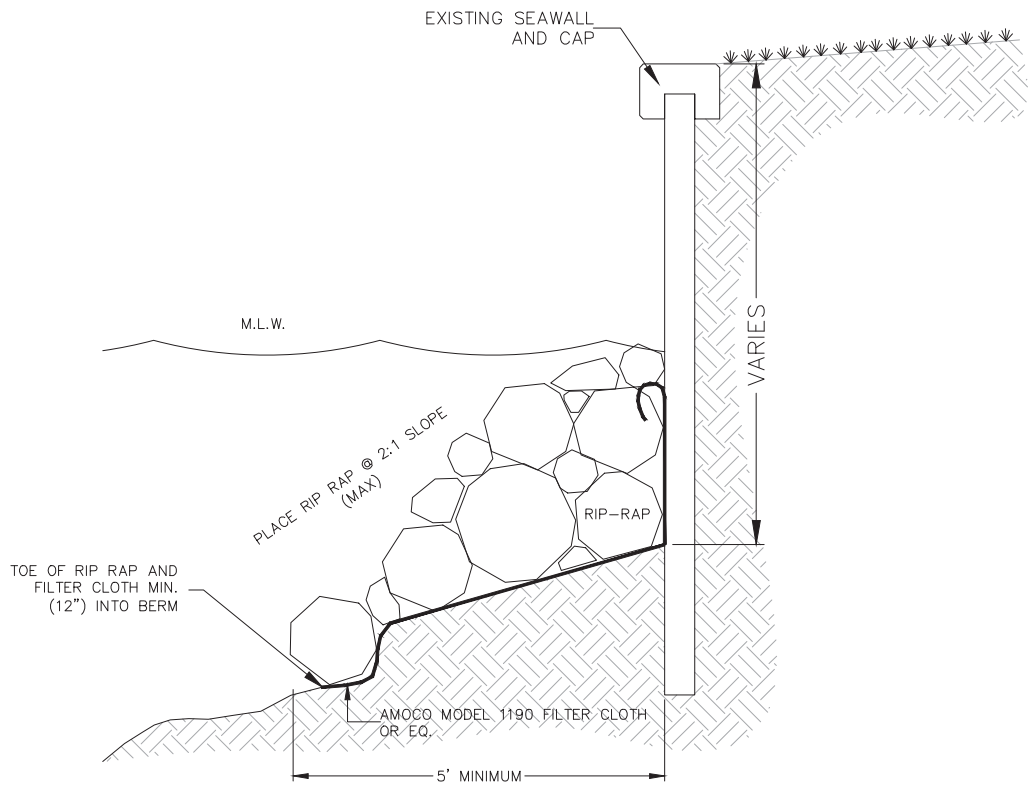
STANDARD DETAIL

14'-0" PRECAST  
SEAWALL DETAILS

PLATE NO. WD-11

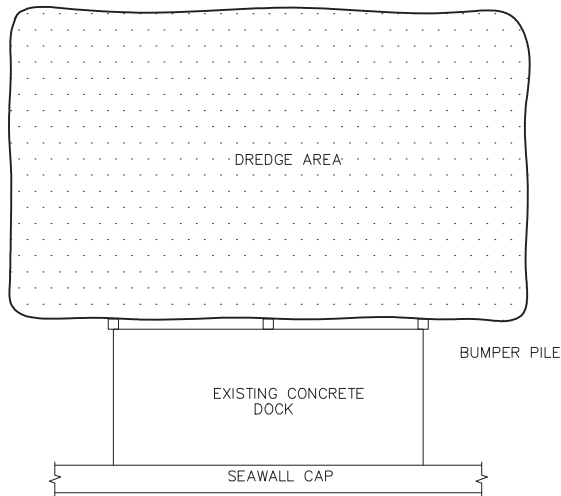
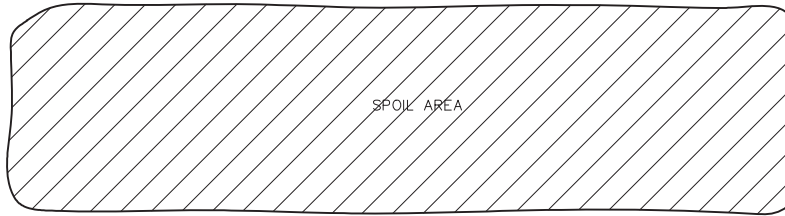
JANUARY, 2015

NOTES:  
 THIS CROSS SECTION IS INTENDED TO SHOW THE ACCEPTED METHOD OF INSTALLING FILTER FABRIC. DO NOT USE THIS DRAWING TO CALCULATE MATERIAL QUANTITIES. ROCK RIP RAP TO BE 12" TO 24" . LONGITUDINAL LAPS ON FILTER CLOTH TO BE (18") MIN.

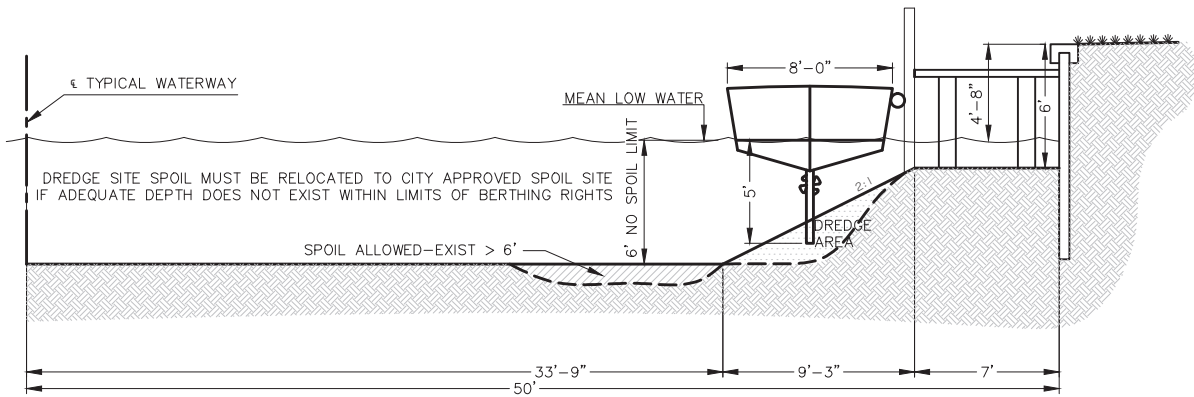


**TYPICAL CROSS SECTION**  
**N.T.S.**

<b>CITY OF PUNTA GORDA</b> 3130 COOPER STREET PUNTA GORDA, FL. 33950 (941) 575-5050	WATERFRONT DEVELOPMENT STANDARDS	STANDARD DETAIL	
		RIP-RAP STABILIZATION DETAIL	
		PLATE NO. WD-12	MARCH, 2015



**TYPICAL DREDGING DETAIL—PLAN VIEW**  
N.T.S.



**TYPICAL DREDGING DETAIL—ELEVATION VIEW**  
N.T.S.

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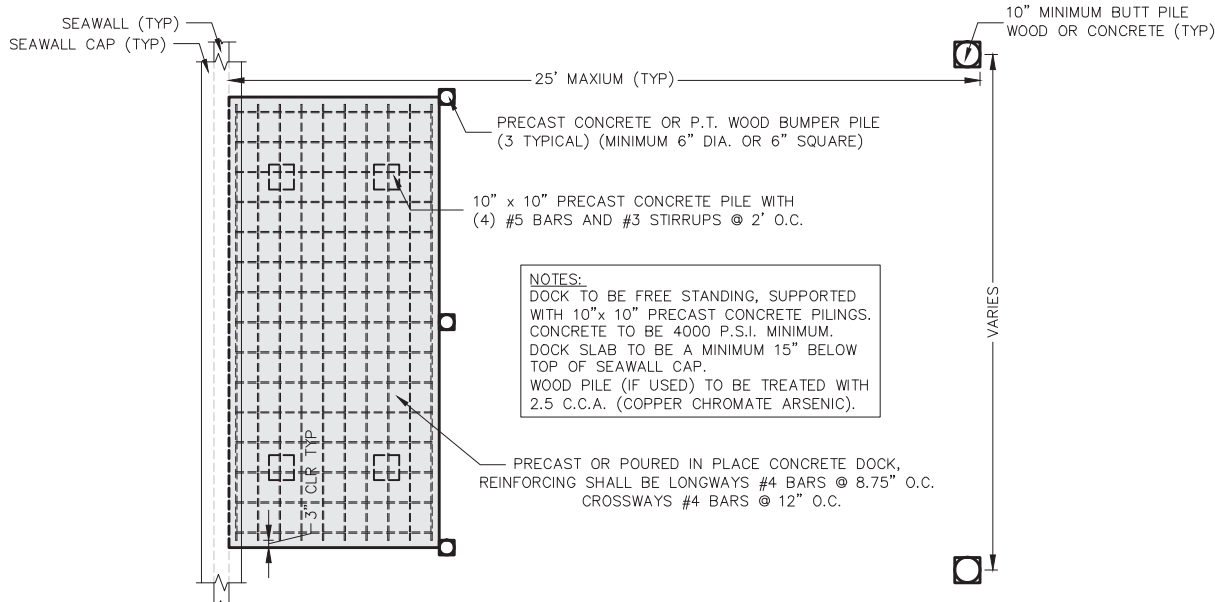
WATERFRONT  
DEVELOPMENT  
STANDARDS

STANDARD DETAIL

STANDARD DOCKSIDE  
DREDGING DETAIL

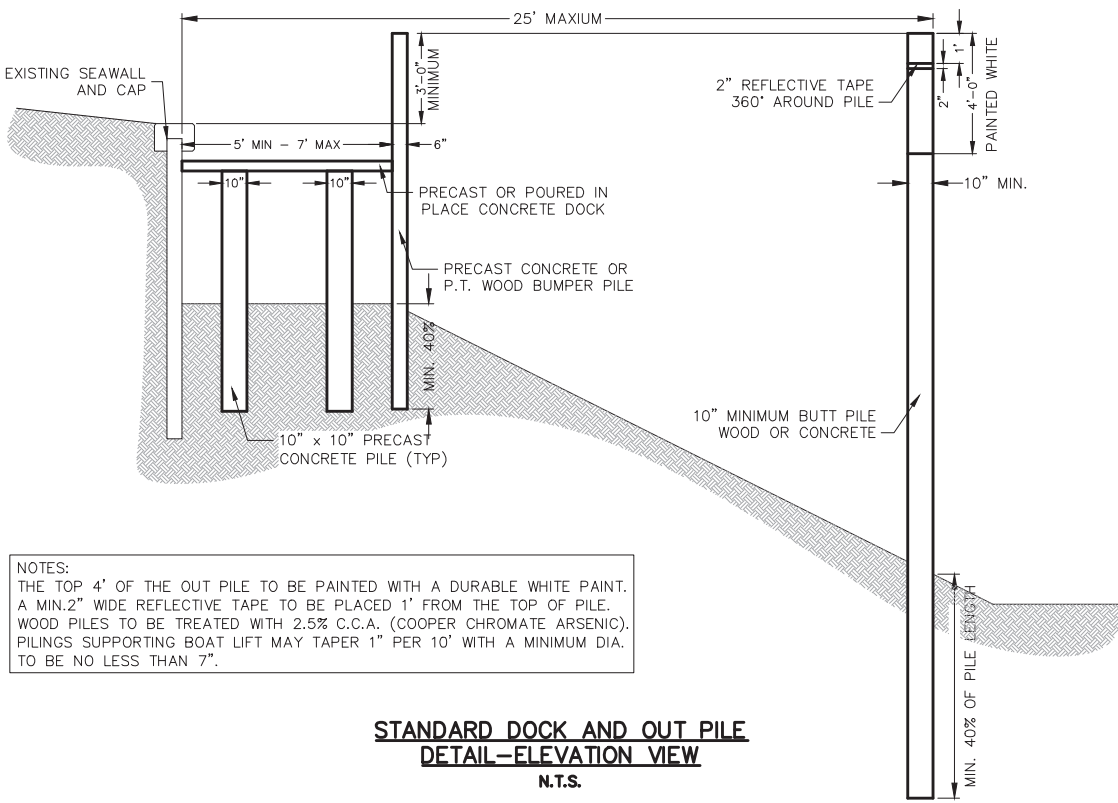
PLATE NO. WD-13

JANUARY, 2015



**NOTES:**  
 DOCK TO BE FREE STANDING, SUPPORTED WITH 10" x 10" PRECAST CONCRETE PILING. CONCRETE TO BE 4000 P.S.I. MINIMUM. DOCK SLAB TO BE A MINIMUM 15" BELOW TOP OF SEAWALL CAP. WOOD PILE (IF USED) TO BE TREATED WITH 2.5 C.C.A. (COPPER CHROMATE ARSENIC).

**STANDARD DOCK AND OUT PILE  
 DETAIL-PLAN VIEW  
 N.T.S.**



**NOTES:**  
 THE TOP 4' OF THE OUT PILE TO BE PAINTED WITH A DURABLE WHITE PAINT. A MIN. 2" WIDE REFLECTIVE TAPE TO BE PLACED 1' FROM THE TOP OF PILE. WOOD PILES TO BE TREATED WITH 2.5% C.C.A. (COOPER CHROMATE ARSENIC). PILING SUPPORTING BOAT LIFT MAY TAPER 1" PER 10' WITH A MINIMUM DIA. TO BE NO LESS THAN 7".

**STANDARD DOCK AND OUT PILE  
 DETAIL-ELEVATION VIEW  
 N.T.S.**

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WATERFRONT  
 DEVELOPMENT  
 STANDARDS

STANDARD DETAIL	
STANDARD CONCRETE DOCK AND OUT PILE DETAIL	
PLATE NO. WD-14	JANUARY, 2015