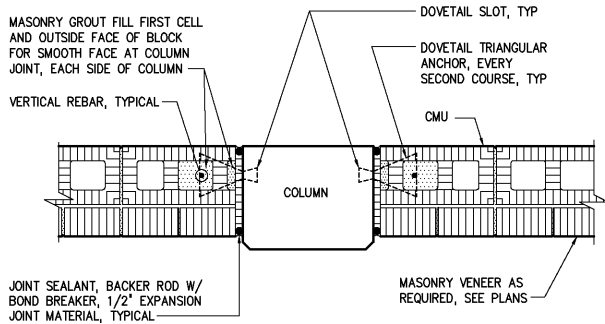
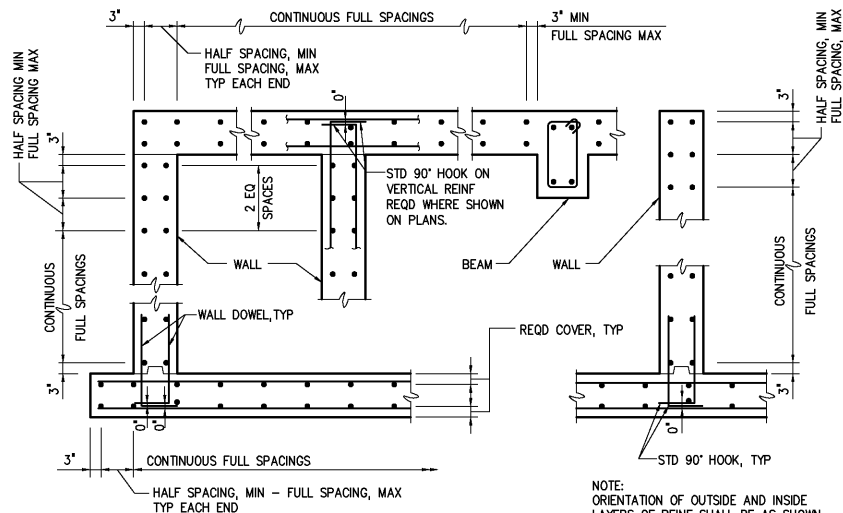


TYPICAL BLOCKOUT FOR EMBEDDED EQUIPMENT FRAME
0331710

INTERIOR WALL

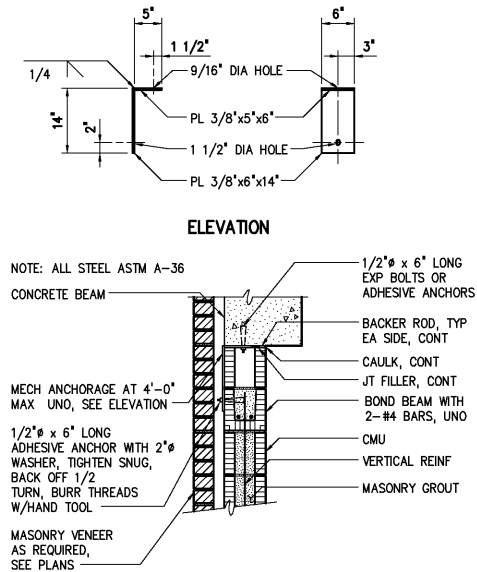


MASONRY TIE-IN AT COLUMN
0417001



SECTION - WALLS AND SLABS

TYPICAL BAR PLACEMENT
0331704

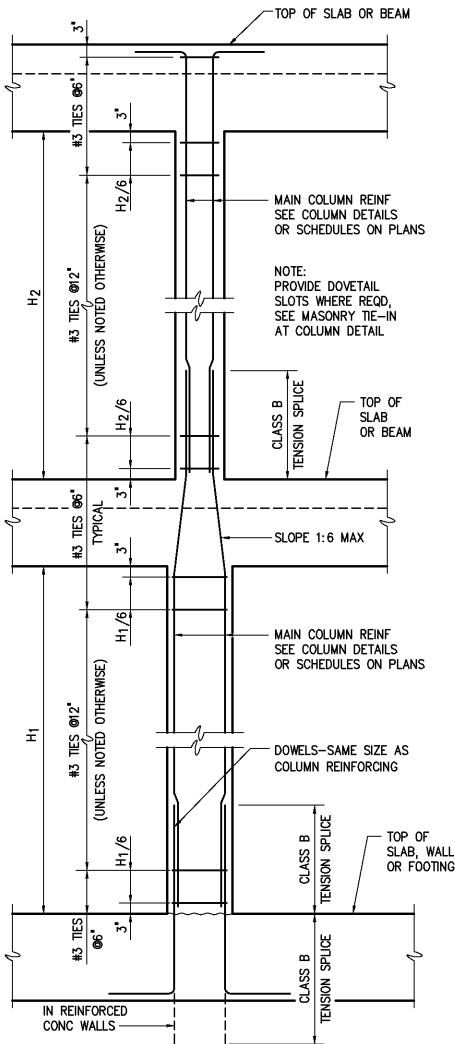


MASONRY WALL TO CONCRETE BEAM CONNECTION
0420109

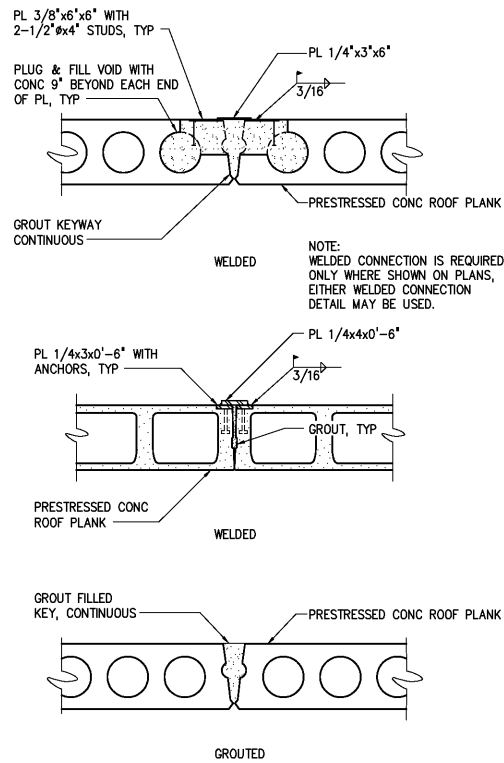
AT TOP OF COLUMN

AT INTERMEDIATE FLOORS, (IF REQD)

AT BOTTOM OF COLUMN



TYPICAL COLUMN ELEVATION
0331800



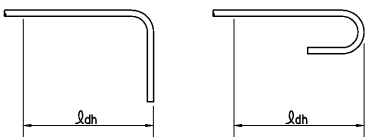
PRECAST PLANK CONNECTION
0341203

DEVELOPMENT LENGTH OF STANDARD HOOKS
FOR BARS IN TENSION

$f_y = 60,000 \text{ psi}$ $f_c' = 4000 \text{ psi OR GREATER}$

BAR SIZE	DEVELOPMENT LENGTH, l_d	
	BASIC	W/ CONC COVER *
#3	8"	6"
#4	10"	7"
#5	1'-0"	9"
#6	1'-3"	11"
#7	1'-5"	1'-0"
#8	1'-7"	1'-2"
#9	1'-10"	1'-4"
#10	2'-1"	1'-6"
#11	2'-3"	1'-7"

* SIDE COVER NORMAL TO PLANE OF HOOK AT LEAST $2 \frac{1}{2}$ ". AND FOR 90° HOOK, END COVER BEYOND OUTSIDE END OF HOOK AT LEAST 2".



0321003

GENERAL CONCRETE NOTES:

- CONCRETE PROTECTION FOR REINFORCING SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED ON THE DRAWINGS:
 - A - CONCRETE DEPOSITED DIRECTLY AGAINST SOIL _____ 3"
 - B - CONCRETE EXPOSED TO WEATHER (#5 OR SMALLER) _____ 1 1/2"
 - (#6 OR LARGER) _____ 2"
 - C - SLABS _____ 1 1/2"
 - AT SURFACES CONTACTING WATER OR SEWAGE _____ 2"
 - D - BEAMS AND COLUMNS (TO MAIN REINFORCEMENT) _____ 2"
 - (TO COLUMN TIES OR STIRRUPS) _____ 1 1/2"
 - SURFACES EXPOSED TO SEAWATER _____ 4"
 - E - WALLS 12" OR MORE _____ 2"
 - WALLS LESS THAN 12" (#5 OR SMALLER) _____ 1 1/2"
 - (#6 OR LARGER) _____ 2"
 - SURFACES EXPOSED TO SEAWATER _____ 3"
 - F - FOR SURFACES EXPOSED TO WATER OR SEWAGE OR AREAS EXPOSED TO HIGH HUMIDITY IN BEAMS, COLUMNS, WALLS AND SLABS ADD 1/2" TO ABOVE.
- SPLICES SHALL BE CLASS "B" CONFORMING TO THE PROVISIONS OF ACI 318 UNLESS NOTED OTHERWISE.
- ALL EMBEDDED ITEMS SHALL BE INSTALLED AND SECURED IN PLACE BEFORE CONCRETE PLACEMENT. CONSULT ELECTRICAL, MECHANICAL AND HVAC DRAWINGS FOR PIPING, EMBEDDED ITEMS AND OPENINGS.
- ALL JOINTS IN WATER BEARING STRUCTURES SHALL HAVE A WATERSTOP. ALL JOINTS BELOW GRADE IN WALLS OR SLABS WHICH ENCLOSE AN ACCESSIBLE AREA SHALL HAVE WATERSTOPS.
- CONSTRUCTION JOINTS NOT SHOWN SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE APPROVAL OF THE ENGINEER PRIOR TO SUBMITTING REBAR SHOP DRAWINGS.
- PROVIDE VERTICAL CONSTRUCTION JOINTS IN WALLS AND HORIZONTAL JOINTS IN SLABS NOT GREATER THAN 45'-0" ON CENTER.
- NO BACKFILL SHALL BE PLACED AGAINST ANY SUBSTRUCTURE WALLS UNLESS ADJACENT FLOOR SLABS HAVE TAKEN THEIR FINAL SET, OR WALLS HAVE BEEN PROPERLY BRACED, AND IN ANY CASE NOT SOONER THAN 28 DAYS AFTER THE PLACING OF CONCRETE UNLESS APPROVED BY THE ENGINEER.

BASIC DEVELOPMENT LENGTH AND SPLICE LENGTH

FOR BARS IN COMPRESSION
 $f_y = 60,000 \text{ psi}$ $f_c' = 4000 \text{ psi OR GREATER}$

BASIC DEVELOPMENT LENGTH		BAR SIZE	SPLICE LENGTH	
BASIC	CONFINEMENT *		BASIC	CONFINEMENT *
8"	8"	# 3	12"	12"
10"	8"	# 4	1'-3"	12"
1'-0"	9"	# 5	1'-7"	1'-3"
1'-3"	1'-0"	# 6	1'-11"	1'-6"
1'-5"	1'-1"	# 7	2'-3"	1'-9"
1'-7"	1'-3"	# 8	2'-6"	1'-11"
1'-10"	1'-4"	# 9	2'-10"	2'-2"
2'-1"	1'-7"	# 10	3'-3"	2'-6"
2'-3"	1'-8"	# 11	3'-7"	2'-9"

* BAR ENCLOSED WITHIN SPIRALS OF NOT LESS THAN 1/4 INCH DIAMETER AND NOT MORE THAN 4 INCH PITCH OR WITHIN #4 TIES IN CONFORMANCE WITH ACI 318, SECTION 7.10.5 AT NOT MORE THAN 4 INCHES ON CENTER, FACTOR 0.75 USED.

0321002

BASIC DEVELOPMENT LENGTH AND SPLICE LENGTH

FOR BARS IN TENSION
** BASED ON MATERIALS AND CONDITIONS AS FOLLOWS:
 $f_y = 60,000 \text{ psi}$ UNCOATED BARS $f_c' = 4000 \text{ psi OR GREATER}$
CLEAR COVER ≥ 1.5 INCHES NORMAL WEIGHT CONCRETE

CLEAR COVER ≥ 1.5 INCHES									
BASIC DEVELOPMENT LENGTH l_d					BAR SIZE	CLASS B SPLICE LENGTH $1.3 \times l_d$			
CLEAR SPACING ≥ 3"		CLEAR SPACING < 3"				CLEAR SPACING ≥ 3"		CLEAR SPACING < 3"	
BASIC	TOP *	BASIC	TOP *			BASIC	TOP *	BASIC	TOP *
1'-0"	1'-0"	1'-0"	1'-4"	# 3	1'-0"	1'-3"	1'-4"	1'-8"	
1'-0"	1'-3"	1'-7"	2'-1"	# 4	1'-3"	1'-8"	2'-1"	2'-9"	
1'-3"	1'-7"	2'-4"	3'-0"	# 5	1'-7"	2'-0"	3'-0"	3'-11"	
1'-6"	1'-11"	3'-1"	4'-0"	# 6	1'-11"	2'-5"	4'-0"	5'-2"	
2'-5"	3'-1"	4'-11"	6'-4"	# 7	3'-1"	4'-0"	6'-4"	8'-3"	
3'-0"	3'-11"	6'-0"	7'-9"	# 8	3'-11"	5'-1"	7'-9"	10'-1"	
3'-8"	4'-9"	6'-9"	8'-9"	# 9	4'-9"	6'-3"	8'-9"	11'-4"	
4'-6"	5'-10"	7'-7"	9'-10"	# 10	5'-10"	7'-7"	9'-10"	12'-9"	
5'-5"	7'-0"	8'-5"	10'-11"	# 11	7'-0"	9'-1"	10'-11"	14'-2"	

* TOP REINFORCEMENT IS HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.

** FOR MATERIALS OR CONDITIONS DIFFERENT FROM THOSE STATED, LENGTHS SHOWN IN CHART SHALL BE MODIFIED TO CONFORM TO THE PROVISIONS OF ACI 318, SECTION 12.2.

0321004

DESIGNED	H & S
DRAWN	H & S
CHECKED	
PROJ. ENGR.	H & S
APPROVED	
NO.	

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CITY OF ROANOKE
VIRGINIA

REGIONAL WATER POLLUTION CONTROL PLANT
WET WEATHER IMPROVEMENTS

MISCELLANEOUS STANDARD DETAILS

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.	DATE JULY 2003
H & S JOB NUMBER 30788A	CONTRACT NUMBER A
DRAWING NUMBER D8	