

ISSUE	DATE	BY	DESCRIPTION

SHEET TITLE:  
**STRUCTURAL NOTES**

DESIGNED:	CCB
DRAWN:	ED
DATE:	1-21-05
CADD FILE:	4016-SI.DWG
PROJECT NUMBER:	4016

SLOPE DESIGNATION: SLOPE

ELEVATION MARK

ROOF PITCH: 12 / 8

SPAN DIRECTION

SECTION MARK: SECTION No. DWG. WHERE SHOWN

UNDISTURBED EARTH

LEDGE

COMPACTED STRUCTURAL FILL

CONCRETE

GROUT

BRICK

CMU

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**LEGEND** SCALE: NTS

AB	ANCHOR BOLT	L	ANGLE
ADDL	ADDITIONAL ARCHITECT AND	LL	DOUBLE LEADS
ARCH &	ANCHITECT	LF	LINEAR FOOT
B/FTG, BOF	BOTTOM OF FOOTING	LLH	LONG LEGS HORIZONTAL
BLDG	BUILDING	LLV	LONG LEGS VERTICAL
BM	BEAM	MAX	MAXIMUM
BTM	BOTTOM	MCH	MECHANICAL
BRG	BEARING	MFR	MANUFACTURER
BTWN	BETWEEN	MIN	MINIMUM
C	CONCRETE	MISC	MISCELLANEOUS
CANT	CANTILEVER	NC	NEAR FACE NUMBER
CIP	CAST-IN-PLACE CONCRETE	NO	NOT TO SCALE
CL	CENTERLINE	NS	NEAR SIDE
CLR	CLEAR	NTS	NOT TO SCALE
CMU	CONCRETE MASONRY UNIT	OC	ON CENTER
CONJ	CONSTRUCTION JOINT	OF	OUTSIDE FACE
CONC	CONCRETE	OPNG	OPENING
CONN	CONNECTION	OPP	OPPOSITE
CONT	CONTINUOUS	P	PIER DESIGNATION
CONTR	CONTRACTOR	PL	PLATE
CP	COMPLETE PENETRATION WELD	PP	PARTIAL PENETRATION WELD
CIR, CEN	CENTER	PRFAB	PREFABRICATED
CY	CUBIC YARD	PSF	POUNDS PER SQUARE FOOT
DIA	DIAMETER	PSI	POUNDS PER SQUARE INCH
DM	DIMENSION	REINF	REINFORCING STEEL
DISCONT	DISCONTINUOUS DRAWING	REQ, REOD	REQUIRED
DWG	DRAWING	SC	SLIP CRITICAL
(E), EX, EXIST	EXISTING	SECT	SECTION
EA	EACH	SHEATH	SHEATHING
EF	EACH FACE	SM	SIMILAR
EL, ELEV	ELEVATION	SOG	SLAB ON GRADE
EQ	EQUAL	SPAC	SPACING
EQUIP	EQUIPMENT	SPECS	SPECIFICATIONS
ES	EACH SIDE	SS	STAINLESS STEEL
EW	EACH WAY	STD	STANDARD
EXP	EXTERIOR	STF	STIFFENER
EXT	EXTERIOR	STL	STEEL
F	FOOTING DESIGNATION	STR	STRAIGHT STRUCTURAL
FDN	FOUNDATION	STRUC	STRUCTURAL
FF	FINISH FLOOR	T	TOP
FLG	FLOOR	T&B	TOP AND BOTTOM
FR	FRAMING	T&C	TOP OF CONCRETE
FT	FOOT	T/FTG, TOF	TOP OF FOOTING
FTG	FOOTING	TEMP	TEMPERATURE
FV	FIELD VERIFY	T/SHELF	TOP OF SHELF
GA	GAGE	T/SLAB	TOP OF SLAB
GALV	GALVANIZED	T/STL	TOP OF STEEL
HOR, HORIZ	HORIZONTAL	TS	STRUCTURAL TUBING TYPICAL
HSS	HOLLOW STRUCTURAL SHAPE	TYP	TYPICAL
HT	HEIGHT	UNO	UNLESS NOTED OTHERWISE
IF	INSIDE FACE	VER, VERT	VERTICAL VERIFY IN FIELD
IN	INCH	VF	VERIFY IN FIELD
INFO	INFORMATION	W	WITH
JT	JOINT	W/O	WITHOUT
K	KIP (1 KIP = 1000 LBS)	WT	WEIGHT
KSI	KIPS PER SQUARE INCH	WWF	WELED WIRE FABRIC

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**ABBREVIATIONS** SCALE: NTS

THE FOLLOWING BUILDING CODES AND STANDARDS SHALL BE REFERENCED DURING CONSTRUCTION:

IBC 2003 EDITION OF THE IBC INTERNATIONAL BUILDING CODE

ASCE 7-02 AMERICAN SOCIETY OF CIVIL ENGINEERS, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

ACI 301-96 AMERICAN CONCRETE INSTITUTE SPECIFICATION FOR STRUCTURAL CONCRETE

AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, NINTH EDITION

ACI 318-02 AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE

ASTM AMERICAN SOCIETY OF TESTING AND MATERIALS

NDS NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION BY NATIONAL FOREST PRODUCTS ASSOCIATION, 2001.

REFERENCE ARCHITECTURAL PLANS FOR DIMENSIONS NOT SHOWN. REFERENCE MECHANICAL, ELECTRICAL, AND ARCHITECTURAL PLANS FOR SIZES AND LOCATIONS OF WALL AND SLAB OPENINGS, DUCTS, PIPING, CURBS, AND EQUIPMENT PADS. IN THE EVENT OF A CONFLICT BETWEEN THE DRAWINGS, SPECIFICATIONS, OR NOTES ON THE DRAWINGS, THE ENGINEER SHALL BE NOTIFIED PRIOR TO CONSTRUCTION.

EXISTING DIMENSIONS AND CONDITIONS ARE FOR REFERENCE ONLY. CONTRACTOR SHALL VERIFY ALL EXISTING CONSTRUCTION AND DIMENSIONS IN THE FIELD PRIOR TO CONSTRUCTION OR FABRICATION. ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER PRIOR TO COMMENCING WORK.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF DEVIATIONS OR CHANGES ARE REQUIRED TO THE CONTRACT DOCUMENTS OR APPROVED SHOP DRAWINGS DUE TO INTERFERENCES, FABRICATION ERRORS, OR OTHER CAUSES.

THE STRUCTURE IS SELF-SUPPORTING AND STABLE AFTER THE ENTIRE BUILDING IS COMPLETELY CONSTRUCTED. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ERECTION PROCEDURES AND SEQUENCING DURING CONSTRUCTION AND ERECTION TO PROVIDE AND ENSURE LOCAL AND OVERALL STABILITY OF THE BUILDING AND ITS COMPONENTS DURING CONSTRUCTION AND ERECTION. THE CONTRACTOR SHALL RETAIN A LICENSED STRUCTURAL ENGINEER TO DESIGN TEMPORARY BRACING/SHORING AND DETERMINE WHERE THE TEMPORARY BRACING/SHORING IS NEEDED.

WHERE SPECIAL INSPECTIONS ARE REQUIRED BY BUILDING OFFICIALS, BUILDING CODES, OR ANY OTHER ENTITY, THE OWNER SHALL HIRE AN INDEPENDENT FIRM OR TESTING AGENCY TO PERFORM THE SPECIAL INSPECTIONS AND BEAR THE RESPONSIBILITY OF COST.

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**GENERAL NOTES** SCALE: NTS

MEZZANINE LIVE LOAD:  
 STORAGE (ABOVE OFFICE AREA) = 125 PSF

SNOW LOADS:  
 SEE STAR BUILDING SYSTEMS DRAWING NO. E1 (JOB NO. 11 B 12162)

WIND LOADS:  
 SEE STAR BUILDING SYSTEMS DRAWING NO. E1 (JOB NO. 11 B 12162)

SEISMIC CRITERIA:  
 SEE STAR BUILDING SYSTEMS DRAWING NO. E1 (JOB NO. 11 B 12162)

CASCO BAY ENGINEERING DESIGNED THE FOUNDATIONS AND THE WOOD FRAMED WALLS/FLOOR SYSTEM ONLY. LOADS USED FOR THE FOUNDATION DESIGN WERE TAKEN FROM PRE-ENGINEERED METAL BUILDING DESIGN BY STAR BUILDING SYSTEMS, INC. DATED NOVEMBER 22, 2004. ANY CHANGES TO THIS DESIGN REQUIRES REVIEW BY CASCO BAY ENGINEERING AND MAY RESULT IN FOUNDATION CHANGES ACCORDINGLY. THE CONTRACTOR SHALL COORDINATE ANY AND ALL DESIGN CHANGE REQUIREMENTS.

ALL OTHER DESIGN IS PROVIDED BY OTHERS. THE STEEL BUILDING STRUCTURE WAS DESIGNED BY STAR BUILDING SYSTEMS.

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**DESIGN CRITERIA** SCALE: NTS

ANCHOR BOLTS SHALL CONFORM TO ASTM A307, GRADE A, STANDARD HEX HEAD FURNISHED WITH HEAVY HEX NUTS AND LOCK WASHERS.

ANCHOR BOLT SETTING DIAGRAMS ARE PROVIDED ON DRAWING F1/1 OF STAR BUILDING SYSTEMS PRE-ENGINEERED METAL BUILDING PLANS. CONTRACTOR TO PROVIDE ANCHOR BOLTS OF SIZE AND SPECIFICATION AS SHOWN ON CASCO BAY ENGINEERING DRAWINGS. CONTRACTOR TO LOCATE ANCHOR BOLTS PER DRAWINGS PROVIDED BY STAR BUILDING SYSTEMS.

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**ANCHOR BOLTS** SCALE: NTS

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**FOUNDATION NOTES** SCALE: NTS

ALL LUMBER SHALL BE VISUALLY GRADED AND STAMPED WITH GRADE DESIGNATION, SPECIES, AND ADDITIONAL INSPECTION INFORMATION, U.N.O.

CARE SHALL BE TAKEN TO PROTECT TIMBER FROM WEATHER AND DAMPNESS. DO NOT STACK IN SUCH A WAY AS TO CAUSE WARPING OR PREVENT ADEQUATE AIR CIRCULATION.

WOOD GRADES AND SPECIES:  
 SPRUCE-PINE-FIR, No.1/No.2 OR BETTER FOR TYPICAL LUMBER (JOISTS, WALLS, ETC) U.N.O.  
 USE SOUTHERN YELLOW PINE FOR EXTERIOR EXPOSURE APPLICATIONS AND WHERE SHOWN ON DRAWINGS AS PRESERVATIVE TREATED LUMBER (PT OR PPT).  
 WHERE NOTED LVL ON DRAWINGS, PROVIDE VERSALAM MEMBERS BY BOISE CASCADE, OR EQUIVALENT, WHICH HAVE THE FOLLOWING MINIMUM ALLOWABLE STRESSES:  
 Fb = 2800 PSI Fc = 1600 PSI (PARALLEL TO GRAIN)  
 Fv = 290 PSI Fc = 900 PSI (PERPENDICULAR TO GRAIN)  
 Ft = 2100 PSI E = 2,000,000 PSI

STRUCTURAL LUMBER SHALL HAVE A MAXIMUM MOISTURE CONTENT OF 19%.  
 PROVIDE PRESSURE TREATED LUMBER FOR ALL LUMBER IN CONTACT WITH MASONRY OR CONCRETE.  
 NOMINAL SIZES ARE TYPICALLY REFERENCED ON THE DRAWINGS. PROVIDE ACTUAL SIZES AS SET FORTH IN U.S. DEPARTMENT OF COMMERCE VOLUNTARY PRODUCT STANDARD PS20-99.

ALL PLYWOOD SHALL BE APA RATED COX SHEATHING:  
 USE 1/2-INCH PLYWOOD WALL SHEATHING. ATTACH PLYWOOD WITH LONG SIDE PERPENDICULAR TO WALL STUDS. STAGGER PANEL ENDS AND BLOCK ALL PANEL EDGES.  
 USE 3/4-INCH PLYWOOD FLOOR SHEATHING. ATTACH PLYWOOD WITH LONG SIDE PERPENDICULAR TO FRAMING. STAGGER PANEL ENDS.

PROVIDE FULL DEPTH BLOCKING AT ENDS AND INTERIOR SUPPORTS OF ALL JOISTS AND RAFTERS WHERE JOISTS AND RAFTERS FRAME OVER SUPPORTS. PROVIDE 1x3 DIAGONAL BRIDGING OR FULL DEPTH SOLID BLOCKING FOR EACH 8'-0" OF SPAN FOR ALL JOISTS AND RAFTERS.

FASTENERS SHALL COMPLY WITH RECOMMENDED FASTENING SCHEDULE PER BOCA TABLE 2305.2, U.N.O. ON DRAWINGS. SPIKE TOGETHER ALL FRAMING MEMBERS WHICH ARE BUILT-UP USING A MINIMUM OF 2-ROWS OF 16g NAILS AT 12" O.C. STAGGERED, UNLESS OTHERWISE NOTED IN BOCA OR ON THE DRAWINGS. NAIL MULTIPLE LVL'S TOGETHER AS RECOMMENDED BY THE MANUFACTURER USING A MINIMUM OF 2-ROWS OF 16g NAILS AT 12" O.C. STAGGERED. ALL FASTENERS, NUTS, AND WASHERS SHALL BE HOT-DIPPED GALVANIZED.

BLOCK ALL LOAD BEARING WALLS VERTICALLY AT 4'-0" O.C. MAXIMUM.

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**WOOD NOTES** SCALE: NTS

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**CONCRETE NOTES** SCALE: NTS

USE DEFORMED BILLET-STEEL REINFORCING BARS, GRADE 60, IN CONFORMANCE WITH ASTM A 615. REINFORCEMENT SHALL BE ACCURATELY PLACED AND SUPPORTED PRIOR TO CONCRETE PLACEMENT, AND SHALL BE SECURED AGAINST DISPLACEMENT.

THE CONTRACTOR SHALL SUBMIT REINFORCING SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND ACCEPTANCE PRIOR TO COMMENCING FABRICATION. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING OF REINFORCED CONCRETE STRUCTURES". SHOP DRAWINGS SHALL SHOW REINFORCING STEEL PLACEMENT DETAILS AND SECTIONS.

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3 INCHES
CONCRETE EXPOSED TO EARTH OR WEATHER	2 INCHES
CONCRETE NOT EXPOSED TO EARTH OR WEATHER IN SLABS AND WALLS (FOR PRIMARY REINFORCEMENT, TIES, AND STIRRUPS)	1-1/2 INCHES
CONCRETE NOT EXPOSED TO EARTH OR WEATHER IN COLUMNS AND BEAMS	1-1/2 INCHES

CONTINUOUS REINFORCEMENT SHALL BE TENSION LAP SPICED PER LAP SPICE LENGTH TABLE, UNLESS OTHERWISE NOTED.

BAR SIZE	#3	#4	#5	#6	#7	#8	#9
MIN LAP SPICE (INCHES)	18	24	30	36	48	64	81

WELDING OF REINFORCEMENT IS NOT PERMITTED, UNLESS OTHERWISE NOTED.

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**CONCRETE REINFORCING NOTES** SCALE: NTS

REFERENCE S.W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT DATED NOVEMBER 23, 2004, FOR SUBGRADE AND SITE PREPARATION AND DETERMINATION (INCLUDING, BUT NOT LIMITED TO, EXCAVATION WORK, GRANULAR BORROW AND COMPACTION REQUIREMENTS), IN THE EVENT OF A CONFLICT BETWEEN THE GEOTECHNICAL REPORT AND STRUCTURAL DRAWINGS, THE STRUCTURAL ENGINEER SHALL BE NOTIFIED PRIOR TO CONSTRUCTION.

AS INDICATED IN THE GEOTECHNICAL REPORT, A LAYER OF UNCONTROLLED FILL (CONSISTING OF A HETEROGENEOUS MIXTURE OF SILT, SAND AND GRAVEL WITH METAL, WOOD, CONCRETE, BRICK AND PLASTIC DEBRIS) IS OVERLAYING VERY STIFF NATIVE BROWN SILTY CLAY. THE GEOTECHNICAL REPORT RECOMMENDS OVEREXCAVATING THE UNCONTROLLED FILL UNDERLYING THE PROPOSED FOUNDATIONS TO EXPOSE STABLE NATIVE NON-ORGANIC BROWN CLAY AND THEN BACKFILLED WITH COMPACTED GRANULAR BORROW. THE WIDTH OF OVEREXCAVATION MUST EXTEND 1 FOOT OUTWARD FROM THE EDGE OF FOOTINGS FOR EACH FOOT OF OVEREXCAVATION DEPTH. S.W. COLE ENGINEERING, INC. ANTICIPATES THAT IT WILL BE NECESSARY TO OVEREXCAVATE BELOW FOOTINGS TO DEPTHS OF 0 TO 3 FEET. THE OVEREXCAVATED AREA SHALL BE BACKFILLED WITH GRANULAR BORROW COMPACTED IN 1-FOOT LIFTS TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 PER THE GEOTECHNICAL REPORT. THE EXISTING FILL SOILS MAY BE SUITABLE FOR REUSE AS COMPACTED FILL PROVIDED ORGANICS, WOOD, AND PLASTIC DEBRIS ARE REMOVED AND SCREENED OUT BEFORE REUSE PER S.W. COLE ENGINEERING.

THE GEOTECHNICAL REPORT RECOMMENDS EXCAVATION TO SUBGRADE BE COMPLETED WITH A SMOOTH-EDGED BUCKET TO PRECLUDE DISTRIBUTION OF THE NATIVE BROWN CLAYS ANTICIPATED AT FOOTING GRADE AND AT THE BASE OF OVEREXCAVATED FOOTING AREAS. CONTRACTOR TO COORDINATE OBSERVATION AS REQUIRED BY S.W. COLE ENGINEERING FOR OVEREXCAVATION AREAS PRIOR TO BACKFILLING AND FOOTING SUBGRADES PRIOR TO THE PLACEMENT OF FOUNDATION CONCRETE.

PRESUMED ALLOWABLE SOIL BEARING PRESSURE USED IN DESIGN = 2000 PSF.  
 MINIMUM FROST DEPTH COVER = 4'-6" FOR EXTERIOR FOOTINGS BELOW FINAL EXTERIOR GRADE.

FOUNDATION WALLS SHALL BE BACKFILLED SIMULTANEOUSLY ON BOTH SIDES OF THE WALL. FOUNDATION WALLS AND SLAB-ON-GRADES SHALL REACH THEIR FULL 28 DAY COMPRESSIVE STRENGTH PRIOR TO BACKFILLING. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING/BRACING FOR WALLS WHEN BACKFILL IS PLACED PRIOR TO CONCRETE ACHIEVING ITS FULL 28 DAY STRENGTH. BACKFILL FOR FOUNDATION WALLS IS BASED ON DRAINED CONDITIONS. SEE ARCHITECTURAL, CIVIL, AND MECHANICAL DRAWINGS FOR FOUNDATION DRAINAGE SYSTEM.

PROTECT FOUNDATIONS FROM FROST AND KEEP BOTTOM OF TRENCH DRY DURING CONSTRUCTION. IF GROUNDWATER IS ENCOUNTERED NEAR OR ABOVE THE BASE OF THE FOOTINGS, EXCAVATIONS SHALL BE Dewatered DURING CONSTRUCTION. SURFACE WATER SHALL BE DIVERTED AWAY FROM EXCAVATIONS.

CONTRACTOR SHALL BE RESPONSIBLE FOR THE SHORING AND BRACING OF EXISTING STRUCTURES DURING EXCAVATION, BACKFILLING, AND CONSTRUCTION. CONTRACTOR SHALL SLOPE EXCAVATIONS TO ACHIEVE SOIL STABILITY. REFERENCE GEOTECHNICAL REPORT FOR ALL RECOMMENDATIONS.

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**GENERAL NOTES** SCALE: NTS

WHERE: W/C = WATER TO CEMENT RATIO AND  
 f<sub>c</sub> = COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS

MAXIMUM AGGREGATE SIZE SHALL BE 3/4 INCH, IN CONFORMANCE WITH ASTM C33. USE PORTLAND CEMENT TYPE II, IN CONFORMANCE WITH ASTM 150. AIR ENTRAINMENT ADMIXTURES SHALL CONFORM TO ASTM C 260. ADMIXTURES SHALL CONFORM TO "SPECIFICATION FOR CHEMICAL ADMIXTURES FOR CONCRETE" ASTM C 494. FLY ASH USED AS ADMIXTURES SHALL CONFORM TO ASTM C 618. CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE IS NOT PERMITTED.

MAXIMUM SLUMP AFTER THE ADDITION OF A WATER-REDUCING ADMIXTURE IS 8 INCHES.

CONCRETE EXPOSED TO FREEZING AND THAWING, INCLUDING FOUNDATIONS, FOOTINGS, FOUNDATION WALLS, AND EXTERIOR WALKWAYS SHALL BE AIR ENTRAINED WITH AIR CONTENT BETWEEN 5% AND 6%. CONTRACTOR SHALL NOT PLACE CONCRETE ON FROZEN GROUND OR IN WATER. ADEQUATE EQUIPMENT SHALL BE PROVIDED FOR HEATING CONCRETE MATERIALS AND PROTECTING CONCRETE DURING NEAR-FREEZING OR FREEZING WEATHER. REFERENCE ACI 306, AS NOTED ABOVE, FOR RECOMMENDATIONS FOR COLD WEATHER CONCRETING.

CONTRACTOR SHALL SUBMIT PROPOSED CONCRETE MIX DESIGN AND LABORATORY TESTS OF FABRICATED CYLINDERS VERIFYING CONCRETE STRENGTH OR PERFORMANCE HISTORY OF MIX TO ENGINEER FOR ACCEPTANCE PRIOR TO PLACEMENT OF CONCRETE. CONCRETE USED ON SITE SHALL BE FIELD TESTED IN ACCORDANCE WITH AND IN THE PRESENCE OF AN APPROVED TESTING AGENCY. FIELD TESTING INFORMATION SHALL INDICATE SLUMP, AIR CONTENT, AND TEMPERATURE. COMPRESSION TEST 1 CYLINDER AT 7 DAYS AND 2 AT 28 DAYS. HOLD AN ADDITIONAL CYLINDER FOR A 56 DAY BREAK. IF NECESSARY, PROVIDE A SET OF 4 CYLINDERS FOR EACH PLACEMENT AND PER 50 CUBIC YARDS OF CONCRETE PLACED. THE OWNER SHALL PAY FOR ALL CONCRETE TESTING.

CONSTRUCTION JOINTS IN WALLS SHALL BE PERMITTED AS DETAILED ON THE STRUCTURAL DRAWINGS. SURFACES OF CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND LAUNCE REMOVED. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED. VERTICAL CONSTRUCTION JOINTS IN WALLS SHALL NOT EXCEED A SPACING OF 40 FEET.

WHERE ELECTRICAL CONDUIT/ RADIANT HEATING TUBES RUN IN THE SLAB, THEY SHALL BE LOCATED AT MID-DEPTH OF THE SLAB. ALUMINUM CONDUIT AND SLEEVES ARE NOT PERMITTED.

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