STRUCTURAL NOTES

A. **PROJECT REFERENCES:**
1. **CODE:** WORK SHALL BE EXECUTED IN FULL COMPLIANCE WITH THE APPLICABLE PROVISIONS OF ALL LAWS, BY-LAWS, STATUTES, ORDINANCES, CODES, RULES, REGULATIONS, AND LAWFUL ORDERS OF PUBLIC AUTHORIIES BEARING ON THE PERFORMANCE AND EXECUTION OF THE WORK.

CODES AND STANDARDS

BUILDING CODE	IBC 2021 (ASCE 7-16)
RISK CATEGORY	II
FM APPROVED PARAMETERS	NO

2. **PROJECT SPECIFICATIONS:** NOTES AND SPECIFICATIONS GIVEN ON THE STRUCTURAL DRAWINGS ARE EXCERPTS FROM THE RELATING PROJECT SPECIFICATIONS. THEY ARE NEITHER COMPLETE NOR DO THEY REPLACE THE CONTRACT SPECIFICATIONS.
3. **MATERIAL STANDARDS:** REFERENCED STANDARDS OR PUBLICATIONS SHALL PERTAIN TO MOST CURRENT DATA, STANDARD OR PUBLICATION..

B. **TEMPORARY BRACING, SHORING AND METHODS:** CONTRACTOR REPONSIBLE FOR THE DESIGN, ADEQUACY, AND SAFETY OF SHORING, BRACING, OTHER TEMPORARY SUPPORTS, AND METHODS OF CONSTRUCTION.
1. **STABILITY:** THE CONTRACTOR SHALL INSURE THE STABILITY OF ALL ELEMENTS INCLUDING, BUT NOT LIMITED TO EXCAVATION, FLOORS, ROOFS, WALLS, FOUNDATIONS, AND ADJACENT PROPERTY AS PROJECT CONDITIONS REQUIRE. THE STRUCTURAL ENGINEER ASSUMES NO RESPONSIBILITY FOR THE STRUCTURE DURING THE ENTIRE CONSTRUCTION PERIOD. BRACE BASEMENT/PIT WALLS UNTIL SUPPORTING FLOORS ARE PLACED AND WALL/FLOOR HAS REACHED DESIGN STRENGTH. BACKFILL BOTH SIDES OF WALLS SIMULTANEOUSLY
2. **LOADING:** THE BUILDING IS DESIGNED ONLY FOR PERMANENT LOADS APPLIED TO THE STRUCTURE IN ITS FINAL CONFIGURATION. DO NOT PLACE MATERIAL OR EQUIPMENT ON FLOORS OR FLOORS IN EXCESS OF THE INDICATED DESIGN LIVE LOADS, AVOID IMPACT LOADS.
3. **SURCHARGE:** IN NO CASE SHALL HEAVY EQUIPMENT BE PERMITTED CLOSER THAN 8'-0" FROM ANY FOUNDATION/BASEMENT WALL. IF THE CONTRACTOR DEEMS IT NECESSARY TO OPERATE SUCH EQUIPMENT CLOSER THAN 8'-0", THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE AND, AT HIS OWN EXPENSE, PROVIDE ADEQUATE SUPPORTS OR WALL BRACES TO WITHSTAND THE ADDITIONAL LOADS SUPERIMPOSED FROM SUCH EQUIPMENT.
4. **SITE SAFETY:** THE CONTRACTOR SHALL BE SOLEY RESPONSIBLE FOR MAINTAINING CONDITIONS OF PUBLIC AND WORKER SAFETY DURING EXECUTION OF THE WORK. THIS SHALL INCLUDE COMPLIANCE WITH ALL OSHA, STATE AND LOCAL REGULATIONS/LAWS AS WELL AS PREPARING AND FILING A SITE SAFETY PLAN OR PROVIDING OTHER WRITTEN SAFETY ASSURANCES AS REQUIRED. ALL CONSTRUCTION METHODS SHALL COMPLY WITH THE REQUIREMENTS OF CHAPTER 33 OF THE IBC, "SAFEGUARDS DURING CONSTRUCTION".
5. **DAMAGE:** CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY MEASURES TO PROTECT THE PREMISES INCLUDING EXISTING FACILITIES, STRUCTURES, AND UTILITY LINES FROM ANY DAMAGE AND REPAIR ALL DAMAGE CAUSED BY THE CONTRACTOR WITH NEW MATERIALS TO MATCH EXISTING TO THE SATISFACTION OF THE OWNER, ARCHITECT AND/OR ENGINEER.

C. **REVIEW AND COORDINATION:**
1. **EXISTING CONDITIONS, DIMENSIONS, AND ACCESSIBILITY** SHALL BE VERIFIED BY ALL CONSTRUCTION TRADES IN FIELD, PRIOR TO SHOP DRAWING PREPARATIONS AND PROCEEDING WITH THE WORK. IF EXISTING CONDITIONS DO NOT PERMIT EXECUTION OF THE WORK IN ACCORDANCE WITH THE SHOWN DETAILS, THE CONTRACTOR MUST SUBMIT A SKETCH WITH PROPOSED MODIFICATION. APPROVAL MUST BE GRANTED BY THE ENGINEER PRIOR TO START OF WORK.
2. **CONSTRUCTION DOCUMENTS**: THE CONTRACTOR SHALL COORDINATE STRUCTURAL PLANS, DETAILS AND DIMENSIONS WITH ALL OTHER CONSTRUCTION DOCUMENTS BEFORE PROCEEDING WITH THE WORK. DISCREPANCIES WITHIN OR BETWEEN OTHER CONSTRUCTION DOCUMENTS SHALL BE NOTIFIED TO THE ENGINEER AND ARCHITECT PRIOR TO BID AND EXECUTION OF THE WORK.
   - **MATERIAL STRENGTHS OR QUANTITIES:** IF DISCREPANCIES OCCUR REGARDING MATERIAL STRENGTHS OR QUANTITIES, HIGHER STRENGTH, AND GREATER QUANTITY SHALL BE USED.
   - **DIMENSIONS AND ELEVATIONS** SHOWN ON STRUCTURAL DRAWINGS ARE GENERATED BY OTHER DISCIPLINES, WITH THE EXCEPTION OF DIMENSIONS OF STRUCTURAL MEMBERS. ANY DIMENSIONS OR ELEVATIONS OMITTED OR NOT SHOWN ON THE STRUCTURAL DRAWINGS SHOULD BE OBTAINED FROM THE OTHER TRADE CONSTRUCTION DOCUMENTS.
3. **INTENT:** ALL DETAILS, SECTIONS, AND NOTES ARE INTEDED TO BE TYPICAL AND SHALL BE CONSTRUED TO APPLY TO SIMILAR CONDITIONS ELSEWHERE.
4. **BID:** UNLESS DRAWING IS PART OF THE FULL SET OF DOCUMENTS LABELED "ISSUED FOR BID," DO NOT CONSIDER IT AS THE BASIS FOR A BID. ALL ESTIMATES BASED ON OTHER DRAWINGS ARE USED AT THE ESTIMATOR'S SOLE RISK.
5. **CHANGES** REQUESTED BY THE CONTRACTOR WILL BE DONE AT NO COST TO THE OWNER. APPROVAL OF CONTRACTOR REQUESTED CHANGES IN NO WAY STATES OR IMPLIES APPROVAL OF A CHANGE IN SCOPE OR CHANGE IN CONTRACT COST. THE CONTRACTOR SHALL MAKE NO DEVIATION FROM THE CONTRACT DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE ENGINEER OF RECORD.
6. **ERRORS:** COSTS OF INVESTIGATION AND/OR REDESIGN DUE TO CONTRACTOR ERRORS WILL BE AT THE CONTRACTORS EXPENSE.

D. **SUBMITTALS:**
1. **REVIEW SCHEDULE:** SUBMIT SHOP DRAWINGS FOR REVIEW AT LEAST 14 DAYS (10 WORKING DAYS) BEFORE RETURNED SUBMITTALS WILL BE NEEDED. ANY REVIEW THAT IS REQUIRED MORE QUICKLY WILL BE AT THE CONTRACTORS EXPENSE.
2. **COMPLETENESS:** A CONTRACTOR'S STAMP CERTIFYING THAT THEY HAVE VERIFIED ALL FIELD MEASUREMENTS, CONSTRUCTION CRITERIA, MATERIALS AND SIMILAR DATA AND HAVE CHECKED EACH DRAWING FOR COMPLETENESS, COORDINATION AND COMPLIANCE WITH THE CONTRACT DOCUMENTS MUST BE PRESENT ON ALL SUBMITTALS FOR REVIEW BY THE ENGINEER OF RECORD. IF REVIEWS OF INCOMPLETE SHOP DRAWINGS/SUBMITTALS ARE REQUIRED, THOSE SUBMITTALS SHALL BE MARKED AS INCOMPLETE UNTIL THEY BEAR SUCH STAMP FROM THE G.C.
3. **ORIGINAL DOCUMENTS:** IN NO CASE SHALL THE CONTRACT DOCUMENTS BE USED/REPRODUCED AS A BASIS FOR SHOP DRAWINGS. SHOP DRAWINGS SHALL BE ORIGINAL DRAWINGS NOT COPIES OF THE CONTRACT DOCUMENTS.
4. **REJECTION:** SUBMITTALS NOT MEETING THE CRITERIA LISTED IN THIS SECTION WILL NOT BE REVIEWED.
5. **DELEGATED DESIGN:** DELEGATED DESIGNS SHALL CLEARLY INDICATE THE APPLICABLE CODES, DESIGN CRITERIA, CONNECTION DETAILS, AND LOAD CAPACITY OF COMPONENTS/SYSTEMS BEING PROVIDED.
   a. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS **AND** CALCULATIONS SIGNED AND SEALED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CONSTRUCTION FOR THE FOLLOWING:
   - SHORING SYSTEMS FOR EXCAVATIONS AND SOIL RETENTION
   - TEMPORARY BRACING, ERECTION BRACING
   - CONCRETE MIX DESIGNS
   - CONCRETE FORMWORK
   - PRECAST COMPONENTS
   - STEEL GRAVITY SHEAR CONNECTIONS

   b. DELEGATED ELEMENTS AND CONNECTIONS SHALL BE ARRANGED SUCH THAT NO ECCENTRICITIES OR TORSION IS CREATED ON THE PRIMARY STRUCTURE. ADDITIONAL BRACING TO RESOLVE SUCH FORCE SHALL BE DETAILED BY THE DELEGATED DESIGNER AND FURNISHED BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING EMBED ITEMS AND HARDWARE AS REQUIRED.

E. **SPECIAL INSPECTIONS (STRUCTURAL)**:
1. **RESPONSIBILITIES**:
   - THIRD PARTY INSPECTION AGENCY SHALL BE CONTRACTED BY THE OWNER.
   - THE CONTRACTOR SHALL BE RESPONSIBLE FOR FILING AND OBTAINING PERMITS AND SIGN-OFFS FROM THE DEPARTMENT OF BUILDINGS.
   - SPECIAL INSPECTIONS AND TESTS, STATEMENTS OF SPECIAL INSPECTIONS, RESPONSIBILITIES OF CONTRACTORS, SUBMITTALS TO THE BUILDING OFFICIAL AND STRUCTURAL OBSERVATIONS SHALL MEET THE APPLICABLE REQUIREMENTS OF IBC CHAPTER 17
2. **STATEMENT OF SPECIAL INSPECTIONS**: MATERIALS, PROCEDURES AND WORKMANSHIP OF LISTED STRUCTURAL ELEMENTS SHALL BE VERIFIED FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS AND APPROVED SUBMITTALS PER THE CORRESPONDING REFERENCES.
3. **INSPECTION DEFINITIONS**:
   - **C - CONTINUOUS**: CONSTANT MONITORING OF IDENTIFIED TASKS BY A SPECIAL INSPECTOR OVER THE DURATION OF PERFORMANCE OF SAID TASKS.
   - **P - PERIODIC**: INTERMITTANTLY INSPECFTED DURING THE COURSE OF EACH WORK DAY TO INSURE THAT APPLICABLE REQUIREMENTS ARE BEING MET. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS AT CONTRACTOR'S RISK.

STATEMENT OF SPECIAL INSPECTIONS (IBC '21)

REQ'D	INSPECTION	VERIFICATION AND INSPECTION ITEM	IBC 21	REFERENCE	TYPE
STEEL					
Yes	WELDING OF STEEL	WELDING OF STRUCTURAL STEEL	1705.2	AISC 360 N.5.4, AWS D1.1	C,P
Yes	JOINT DETAILS	BRACING AND STIFFENING, MEMBER LOCATIONS, AND APPLICATIONS OF JOINT DETAILS AT EACH CONNECTION	1705.2	AISC 360 N.5.7	C
Yes	HIGH-STRENGTH BOLTING	SNUG-TIGHT JOINTS, PRETENSIONSED JOINTS AND SLIP-CRITICAL JOINTS	1705.2	AISC 360 N.5.6, RCSC	C,P
CONCRETE					
Yes	CAST IN PLACE	CONCRETE DESIGN MIX, SAMPLING, FORMWORK, PLACEMENT AND MAINTENANCE	1705.3	ACI 318 CH 20, 25, 26	P
Yes	POST-INSTALLED ANCHOR	ANCHORS INSTALLED IN HARDEND CONCRETE	1705.3	ACI 318: 17.8.2	C
MASONRY					
Yes	MASONRY CONSTRUCTION	MASONRY CONSTRUCTION, DEPENDING ON STRUCTURAL OCCUPANCY CATEGORY OF THE BUILDING OR STRUCTURE	1705.4	ACI 530	C, P
SOILS & FOUNDATION					
Yes	SUBGRADE	EXISTING SITE SOIL CONDITIONS, FILL PLACEMENT, LOAD BEARING REQUIREMENTS	1705.6, 1804	IBC 1705.6, 1804	P
Yes	COMPACTED FILL	COMPACTED FILL, MAXIMUM LIFT THICKNESS PER GEOTECHNICAL REPORT	1705.6, 1804	IBC 1705.6, 1804	C
STRUCTURAL STABILITY					
Yes	EXCAVATION	EXCAVATION, FILLING, SHEETING, SHORING AND BRACING	1705.6, 1804, 1805, 3304	IBC 1705.6, 1804, 1805, 3304	P
Yes	UNDERPINNING	UNDERPINNING STRUCTURES	1705.6	IBC 1705.6	P

DEMOLITION NOTES:

A. **DEMOLITION** OF BUILDINGS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:
1. **DEMOLITION OF WALLS AND PARTITIONS** SHALL PROCEED IN A SYSTEMATIC MANNER, AND ALL WORK ABOVE EACH TIER OF FLOOR BEAMS SHALL BE COMPLETED BEFORE ANY OF THE SUPPORTING STRUCTURAL MEMBERS ARE DISTURBED.
2. **STRUCTURAL STEEL, REINFORCED CONCRETE, AND HEAVY TIMBER BUILDINGS**, OR PORTIONS THEREOF, SHALL BE DEMOLISHED COLUMN LENGTH-BY-COLUMN LENGTH AND TIER-BY-TIER. STRUCTURAL MEMBERS SHALL BE CHAINED OR LASHED IN PLACE TO PREVENT ANY UNCONTROLLED SWING OR DROP.
3. **SKELETON-STEEL**: IN BUILDINGS OF "SKELETON-STEEL" CONSTRUCTION, THE STEEL FRAMING MAY BE LEFT IN PLACE DURING THE DEMOLITION OF MASONRY. WHERE THIS IS DONE, ALL STEEL BEAMS, GIRDERS, AND SIMILAR STRUCTURAL SUPPORTS SHALL BE CLEARED OF ALL LOOSE MATERIAL AS THE MASONRY DEMOLITION PROGRESSES DOWNWARD.
4. **MASONRY WALLS** INCLUDING BRICK VENEER WALLS, OR OTHER SECTIONS OF MASONRY, SHALL NOT BE LOOSENED OR PERMITTED TO FALL UPON THE FLOORS OF THE BUILDING IN SUCH MASSES AS TO EXCEED THE SAFE CARRYING CAPACITIES OF THE FLOORS OR THE STABILITY OF STRUCTURAL SUPPORTS.
5. **STRUCTURAL OR LOAD-SUPPORTING MEMBERS** ON ANY FLOOR SHALL NOT BE CUT OR REMOVED UNTIL ALL STORIES ABOVE SUCH A FLOOR HAVE BEEN DEMOLISHED AND REMOVED. THIS PROVISION SHALL NOT PROHIBIT THE CUTTING OF FLOOR BEAMS FOR THE DISPOSAL OF MATERIALS OR FOR THE INSTALLATION OF EQUIPMENT NECESSARY TO SAFELY COMPLETE THE DEMOLITION, SO LONG AS THE CUTTING DOES NOT NEGATIVELY IMPACT THE SAFETY OF THE FLOOR SYSTEM BEING CUT. COORDINATE WITH A LICENSED ENGINEER PRIOR TO CUTTING WORK/TEMPORARY OPENINGS.
6. **CONTRACTOR REVIEW:** LAYOUT/FRAMING SHOWN ON DEMO PLANS IS BASED UPON LIMITED VISUAL INSPECTION OF BUILDING. CONTRACTOR MUST VISIT THE SITE AND VERIFY EXISTING FRAMING, STUDY EXISTING PHYSICAL CONDITIONS AND REVIEW DRAWINGS. IT IS CONTRACTOR'S RESPONSIBILITY TO INSPECT AND ASSESS EACH AREA AND TO FULFILL THE INTENT OF THE DESIGN INDICATED BY THE CONTRACT DOCUMENTS.

B. **TEMPORARY SHORING**, AS REQUIRED FOR WALL/FRAMING STABILITY, SHALL BE PROVIDED BY A LICENSED ENGINEER PRIOR TO DEMOLITION. DESIGN DRAWINGS AND CALCULATIONS FOR ALL SHORING SHALL BE PROVIDED FOR ARCHITECT AND ENGINEER OF RECORD REVIEW. SUCH SHORING SHALL BE APPLIED IN ANY CASE WHERE LATERAL BRACING IS BEING REMOVED FROM STANDING FRAMING, NOT LIMITED TO THE FOLLOWING CONDITIONS:
   a. **FOUNDATION/BASEMENT WALLS** WHERE FLOOR FRAMING/SLABS ARE REMOVED, DEMOLISHED, OR OTHERWISE COMPROMISED SHALL HAVE THE TOP AND BOTTOM WALL CONTINUOUSLY BRACED AGAINST LATERAL EARTH PRESSURE.
   b. **LIMIT ON WALL HEIGHTS:** NO WALL SECTION, WHICH IS MORE THAN ONE STORY OR 12 FEET (3658 MM) IN HEIGHT, SHALL BE PERMITTED TO STAND ALONE WITHOUT LATERAL BRACING.

C. **COLUMNS/POST FRAMING** THAT IS BRACED AT FLOOR LEVELS BY TWO ORTHOGONAL DIRECTIONS SHALL BE SHORED IF DEMOLITION WORK COMPROMISES EITHER PRIMARY COLUMN BRACING DIRECTION. THIS IS PARTICULARLY CRITICAL AT MULTI-SPAN COLUMN CONDITIONS WHERE THE POTENTIAL OF REMOVING FLOOR FRAMING CAN LEAD TO SIGNIFICANT INCREASES IN THE BUCKLING LENGTH OF THE COLUMN.

D. **TEMPORARY PROTECTION**: THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE FOLLOWING:
1. ADJACENT OR EXISTING STRUCTURES, SITE IMPROVEMENTS, APPURTENANCES, AND LANDSCAPING TO REMAIN OR ARE EXPOSED TO BUILDING DEMOLITION OPERATIONS.
2. PEOPLE AND VEHICULAR TRAFFIC AROUND BUILDING DEMOLITION AREA AND OCCUPIED PORTIONS OF STRUCTURES AND ADJACENT STRUCTURES.
3. WHERE REQUIRED BY AUTHORITIES HAVING JURISDICTION.

E. **SAFETY ZONE** SHALL BE MAINTAINED AROUND ALL DEMOLITION AREAS TO PREVENT NON-AUTHORIZED PERSONS FROM ENTERING THE ZONE. WHERE MECHANICAL DEMOLITION EQUIPMENT, OTHER THAN HANDHELD DEVICES, IS TO BE USED FOR DEMOLITION OF THE BUILDING, THE SAFETY ZONE SHALL BE EQUAL TO OR GREATER THAN HALF THE HEIGHT OF THE BUILDING TO BE DEMOLISHED. SUCH A SAFETY ZONE MAY BE REDUCED AT A RATE IN RATIO TO THE EXTENT OF DEMOLITION, AS DEMOLITION OCCURS. FOR EXAMPLE, AT THE TIME 50% OF THE DEMOLITION IS COMPLETE, THE SAFETY ZONE MAY BE REDUCED BY 50%.

F. **MECHANICAL DEMOLITION EQUIPMENT** SHALL NOT BE USED WHERE THE STRUCTURE UNDERGOING DEMOLITION IS PHYSICALLY CONNECTED TO A STRUCTURE NOT BEING DEMOLISHED.

G. **PROTECTED SPACE:** ALL WORK SHALL BE DONE IN PROTECTED SPACE. NO DUST OR DIRT SHALL TRAVEL FROM CONSTRUCTION AREA TO ADJACENT AREAS.

H. **POLLUTION CONTROLS:** USE WATER SPRINKLING, TEMPORARY ENCLOSURES, AND OTHER METHODS TO LIMIT DUST AND DIRT FROM SCATTERING OR RISING INTO THE AIR. COMPLY WITH ALL GOVERNING REGULATION PERTAINING TO ENVIRONETIMENTAL PROTECTION.

FOUNDATION UNDERPINNING

A. **UNDERPINNING NOTES:**
1. **WORK REQUIREMENTS:** ALL FOUNDATIONS & EARTHWORK OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNING BUILDING CODE AND ALL LOTS, BUILDINGS, AND SERVICE FACILITIES ADJOINING THE FOUNDATION AND EARTHWORK AREAS SHALL BE PROTECTED AND SUPPORTED.
2. **INSPECTION:** ALL TEST PITS, BORINGS, AND UNDERPINNING OPERATIONS ARE SUBJECT TO CONTROLLED INSPECTION.
3. **SURVEY:** THE OWNER SHALL RETAIN A LICENSED SURVEYOR TO SURVEY ALL LOAD BEARING WALLS, PIERS, AND COLUMNS TO BE UNDERPINNED. THE SURVEYOR SHALL CHECK THE DATUM OF SUCH STRUCTURAL ELEMENTS PRIOR TO EXCAVATION AND EVERY TWO WEEKS FOR DURATION OF THE WORK.
4. **WATER TABLE:** EXCAVATION BELOW THE WATER TABLE SHOULD BE AVOIDED. DEWATER THE SITE PRIOR TO THE EXCAVATION MAY ONLY PROCEED AFTER REVIEW BY THE EOR
5. **OBSERVATION REPORTING:** DURING THE COURSE OF THE UNDERPINNING, THE CONTRACTOR SHALL MAINTAIN CONTINUAL OBSERVATIONS OF OPERATIONS AND SHALL BE COMPLETELY RESPONSIBLE FOR THE SAFETY OF THE EXISTING STRUCTURES. SHOULD THE CONTRACTOR BECOME AWARE OF ANY SITUATION THAT REQUIRES FURTHER INVESTIGATION OR STUDY, SUCH AS CRACKS IN MASONRY, ADDITIONAL DEFLECTIONS, ANY DISCREPANCY TO DRAWINGS, ETC. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
6. **BEARING:** THE UNDERPINNING FOUNDATIONS SHALL BEAR ON SUBGRADE HAVING BEARING CAPACITY EQUAL TO OR GREATER THAN THE SUBGRADE OF THE EXISTING FOUNDATION. THE SUBGRADE AT THE LEVEL OF THE EXISTING FOUNDATION SHALL BE INSPECTED BY A LICENSED PROFESSIONAL ENGINEER RETAINED BY THE OWNER TO VERIFY THE BEARING CAPACITY, AND DEFICIENCIES BROUGHT TO THE ATTENTION OF THE EOR
7. **CONCRETE STRENGTH:** ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4,000 PSI @ 28 DAYS.
8. **GROUT/DRY PACK:** ALL DRYPACK SHALL BE NON-SHRINK GROUT (ASTM C1107) WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI. ALL DRYPACK SHALL BE MIXTURE OF 1 PART CEMENT AND 2 PARTS DAMP SAND, WITH 0" SLUMP.
9. **PROTECTION:** THE CONTRACTOR SHALL SAFEGUARD AND PROTECT ALL EXCAVATIONS. ALL EXCAVATION PITS SHALL BE BRACED TO PREVENT ANY LOSS OF SOIL BENEATH ADJOINING PROPERTY.
10. **LIFT BRACING:** MAXIMUM UNBRACED LIFT HEIGHT IS 4' - 0". FOR DEEP LIFTS, PROVIDE BRACING FOR EXISTING WALL AND NEW UNDERPINNING. BRACING AND SHORING TO BE DESIGNED BY THE CONTRACTOR'S MEANS & METHODS ENGINEER. THE DEPTH OF UNDERPINNING PITS SHALL BE A MAXIMUM OF ONE LIFT.
11. **JOINTS:** THE LIFT SHALL BE WITHOUT INTERMEDIATE HORIZONTAL CONSTRUCTION JOINTS (COLD JOINTS). MULTIPLE (VERTICAL) LEVELS OF UNDERPINNING SHALL NOT BE PERMITTED.
12. **WIDTH LIMIT:** MAXIMUM UNDERPINNING SECTION WIDTH IS 3' - 0".
13. **LAYOUT:** PRIOR TO COMMENCING UNDERPINNING, ALL PANELS TO BE LAID OUT AND MARKED IN SEQUENTIAL NUMBERING ORDER.
14. **ORDER:** EXCAVATE AND PLACE PANELS "1" FIRST, "2" SECOND, "3" THIRD, AND "4".
15. **SPACING:** SPACING BETWEEN OPEN UNDERPINNING SECTIONS IS 12 FEET MINIMUM.
16. **KEY:** PROVIDE 2" DEEP BY 4" WIDE VERTICAL KEY ON BOTH SIDES OF UNDERPINNING SECTIONS W/ #4 DOWELS @ 18" O.C.
17. **SHIMMING/GROUTING:** CONSTRUCT UNDERPINNING SECTION WITHIN 2" OF THE UNDERSIDE OF THE EXISTING FOUNDATION WALL TO ALLOW FOR INSTALLATION OF DRY PACK MORTAR. TAPERED STEEL SHIMS @ 2' - 0" O.C. MAX. WITH 2" OF DRY PACK ALL AROUND SHIMS.
18. **PLUMBNESS:** THE UNDERPINNING SHALL BE INSTALLED IN A MANNER SUCH THAT THE EXPOSED FACE OF THE CONCRETE IS VERTICAL, U.N.O.
19. **LOAD TRANSFER:** DO NOT TRANSFER LOAD ONTO UNDERPINNING PIERS UNTIL CONCRETE POUR HAS REACHED A MINIMUM OF 75% OF ITS 28-DAY COMPRESSIVE STRENGTH AS CONFIRMED BY CYLINDER TEST.

B. **EXISTING WALL UNDERPINNING SEQUENCE:**
1. STARTING WITH SEGMENTS "A", ONLY DIG PITS 3' - 0" WIDE, MAXIMUM SIMUTANEOUSLY PLACING REQUIRED SHEETING AND BRACING (LEAVE MIN. 12' - 0" OF EXISTING SOIL BETWEEN PITS).
2. CLEAN BOTTOM OF EXISTING FOOTING AND COMPACT SOIL TO 95% OF MAXIMUM DENSITY IN LIFTS NO GREATER THAN 8". LOSS OF GROUND SHOULD BE KEPT TO A MINIMUM BY BACKFILLING BEHIND THE BOARDS WHERE AND WHEN POSSIBLE WITH GROUP PUMPED INTO VOIDS
3. CONTRACTOR SHALL INSTALL ADAQUATE LATERAL BRACNG SYSTEMS TO PREVENT MOVEMENT IN THE EXISTING STRUCTURES AND IN THE NEW UNDERPINNING
4. POUR NEW CONCRETE UNDERPINNING FOR SEGMENT **"1"**. AFTER CONCRETE COMPLETES 24 HOURS OF CURING, PLACE STEEL SHIMS AT 2' - 0" O.C. MIN. THEN PACK SOLID W/ DRYPACK INTO SPACE BETWEEN TOP OF UNDERPINNING AND BOTTOM OF EXISTING FOOTING, TO TRANSFER LOAD. ENSURE THE BACK OF VOID IS FORMED SO THAT DRYPACK IS NOT LOST WHEN RAMMED INTO THE GAPS.
5. FOR SEGMENT **"2"** DIG PITS 3 '- 0" O.C. MAX., WIDE. THEN FOR SEGMENT **"2"** REPEAT CONCRETING, CLEANING, STEEL SHIMS, AND DRY PACKING PER NOTE 2, 3, 4.
6. FOR SEGMENT **"3"** DIG PITS 3' - 0" O.C. MAX., WIDE. THEN FOR SEGMENT **"3"** REPEAT CONCRETING, CLEANING, STEEL SHIMS, AND DRY PACKING PER NOTE 2, 3, 4.
7. FOR SEGMENT **"4"** DIG PITS 3' - 0" O.C. MAX., WIDE. THEN FOR SEGMENT **"4"** REPEAT CONCRETING, CLEANING, STEEL SHIMS, AND DRY PACKING PER NOTE 2, 3, 4.
8. UNDERPINNING PITS CLOSER THAN 12' APART SHALL NOT BE EXCAVATED AT THE SAME TIME.
9. WHERE BOTTOM OF ADJACENT UNDERPINNING PITS ARE AT DIFFERENT ELEVATIONS, THE DEEPER PIT SHALL BE INSTALLED FIRST.
10. SEQUENCE ORDER IS RESPONSIBILITY OF THE CONTRACTOR, AS IS LAYOUT AND FIELD VERIFICATION OF ALL DIMENSIONS/CONDITIONS/CONSTRAINTS PRIOR TO MOBILIZATION.

FOUNDATION NOTES

A. **STANDARDS**
1. ALL FOUNDATION WORK SHALL CONFORM TO THE APPLICABLE CONCRETE WORK NOTES.

B. **GEOTECHNICAL DATA**
1. **REFERENCE:** FOUNDATIONS HAVE BEEN DESIGNED WITH CONFORMANCE TO THE GEOTECHNICAL ENGINEERING REPORT INDICATED IN FOUNDATION CRITERIA TABLE.
2. **SITE PREPARATION AND EXCAVATION WORK:** SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT.

FOUNDATION CRITERIA

GEOTECHNICAL ENGINEER	N/A
GEOTECH REPORT DATE	N/A
BEARING CAPACITY	2,000 PSF (ASSUMED)
FROST DEPTH	3' - 0"

C. **SHALLOW FOUNDATION**
1. **VERIFICATION OF BEARING CAPACITY:** THE ADEQUACY OF THE BEARING STRATUM AND ELEVATION AT THE ELEVATOR MAT SLAB SHALL BE INSPECTED AND APPROVED, IN WRITING, BY A REGISTERED GEOTECHNICAL ENGINEER HIRED BY THE OWNER PRIOR TO PLACING CONCRETE. WRITTEN APPROVAL SHALL SPECIFY THAT THE SOIL HAS THE CAPACITY TO SUPPORT THE DESIGNED BEARING PRESSURE. FOUNDATION SHALL NOT BEAR ON (OR ABOVE) EXISTING FILL MATERIALS.

D. **FOUNDATION PLACEMENT**
1. **FROST DEPTH:** ALL EXTERIOR FOOTINGS SHALL BE PROTECTED FROM FROST BY EXTENDING BELOW THE FROST DEPTH PER FOUNDATION CRITERIA TABLE.
2. **SUBGRADE:** ALL FOUNDATION SUBGRADE PREPARATION AND CRUSHED STONE FILL BLANKETS BENEATH SLAB ON GRADE SHALL COMPLY WITH THE PROJECT'S GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. **DEWATERING**: DEWATERING OF THE SITE, INCLUDING METHODS OF DEWATERING AND CALCULATIONS, DURING CONSTRUCTION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL CONTROL SURFACE AND SUBSURFACE WATER DURING CONSTRUCTION SO THAT THE FOUNDATION WILL BE CONSTRUCTED ON DRY SOIL/ROCK.
4. **FREEZING:** NO FOUNDATION SHALL BE PLACED IN WATER OR FROZEN GROUND.
5. **BACKFILL**
   A. AROUND THE EXTERIOR OF WALLS (UNBALANCED) SHALL NOT BE PLACED UNTIL AFTER THE WALLS ARE SUPPORTED (BRACED) BY THE COMPLETION OF THE INTERIOR FLOOR SYSTEMS AT BOTH THE BOTTOM AND TOP OF WALL.
   B. DO NOT PROCEED WITH BACKFILL UNTIL SEVEN (7) DAYS AT A MINIMUM AFTER THE COMPLETION OF INTERIOR FLOOR SYSTEM INSTALLATION (CONCRETE) UNLESS WALLS ARE OTHERWISE TEMPORARILY SHORED/BRACED.
6. BACKFILL SHALL NOT BE PLACED UNTIL AFTER COMPLETION AND INSPECTION OF WATERPROOFING WHERE APPLICABLE.
7. **MATERIAL ACCEPTANCE:** ALL UNSUITABLE MATERIALS SHALL BE REMOVED FROM SUBGRADE AND BACKFILL AREAS AND BACKFILLED WITH ACCEPTABLE FILL ACCORDING TO THE SPECIFICATIONS AND COMPACTED TO THE SPECIFIED BEARING CAPACITY
8. **REINFORCEMENT CONTINUITY:** FOUNDATION WALLS AND FOOTINGS (OR CAPS) SHALL HAVE REINFORCEMENT KEPT CONTINUOUS THROUGH ELEMENTS SO ELEMENTS BEHAVE MONOLITHICALLY.
9. **CENTERING:** ALL FOOTINGS SHALL BE CENTERED DIRECTLY BELOW COLUMNS/WALLS WHICH THEY SUPPORT UNLESS OTHERWISE NOTED.

E. **EXCAVATION SUPPORT - DESIGN AND PLACEMENT**
1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING ALL EXCAVATION PROCEDURES INCLUDING SHORING, BRACING SHEET PILING, LAGGING, UNDERPINNING, AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES PER LOCAL BUILDING DEPARTMENT REQUIREMENTS. PROJECT SPECIFIC CALCULATIONS AND SHOP DRAWINGS SHALL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED TO STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER FOR REVIEW. INSTALLATION SHALL BE PERFORMED BY A SPECIALTY CONTRACTOR.
2. **WALLS:** PROVIDE ADEQUATE BRACING AND SHORING FOR BASEMENT, RETAINING AND PIT WALLS. BRACE BASEMENT AND PIT WALLS UNTIL SUPPORTING FLOORS ABOVE ARE IN PLACE AND HAVE ATTAINED DESIGN STRENGTH. DO NOT BACKFILL WALLS UNTIL AFTER FLOORS AT THE TOP AND BASE OF THE WALLS ARE IN PLACE. WHERE BACKFILL IS REQUIRED ON BOTH SIDES OF A WALL, BACKFILL BOTH SIDES SIMULTANEOUSLY WITH THE GRADE DIFFERENCE NOT TO EXCEED 2'-0" AT ANY TIME.
3. **UNDERCUTTING**: IF EXCAVATION DEPTH AT FOOTING PROPOSED IS DEEPER THAN 2H:1V PROJECTED FROM EDGE OF ADJACENT EXISTING OR NEIGHBORING FOOTING, UNDERPINNING MAY BE REQUIRED. G.C. TO DETERMINE IF UNDERPINNING IS REQUIRED BEFORE CONSTRUCTION.
4. **SURCHARGE:** CANTILEVERED AND BASEMENT RETAINING WALLS ARE NOT DESIGNED FOR SURCHARGE LOADING ASSOCIATED WITH CONSTRUCTION TRAFFIC BEHIND THE WALL. PROVIDE ADEQUATE TEMPORARY BRACING TO RESIST LATERAL LOADS ASSOCIATED WITH MEANS AND METHODS OF CONSTRUCTION.

F. **EXCAVATION SUPPORT - INSTALLATION**
1. THE CONTRACTOR SHALL INSURE THAT EFFICIENT MEANS ARE PROVIDED TO PROPERLY TRANSFER EXTERNAL FORCES FROM THE SHEETING AND SHORING TO THE INTERNAL BRACING.
2. CONDITIONS OF NEARBY STRUCTURES THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE DOCUMENTED PRIOR TO SHEETING AND/OR SHORING, AND SHALL BE MONITORED DURING THE CONSTRUCTION.
3. ALL ABUTTING ENDS OF BRACING SHALL BE IN FULL BEARING ACROSS THE ENTIRE SECTION OF THE MEMBER.
4. BRACING SHALL BE INSTALLED (POSTED AND TIED) SO AS TO PREVENT SPREADING OR DISTORTION OF THE BRACED FRAMES.
5. BRACING SHALL CLEAR COLUMNS, FLOOR FRAMING ELEMENTS, AND OTHER PERMANENT WORK.
6. PROPERLY SUPPORT HORIZONTAL WALES TO PREVENT UNACCEPTABLE MOVEMENT OR OVERTURNING DUE TO THRUSTS FROM THE BRACING.
7. FILLERS AND WEDGES SHALL BE PROVIDED AS REQUIRED, BETWEEN THE SHEETING AND THE WALES AT THE TIME OF INSTALLATION OF EACH LEVEL OF BRACING, AND THE BRACING SYSTEM TO BE PROPERLY STRESSED AT ALL TIMES.
8. BRACING SHALL NOT BE CAST INTO PERMANENT CONCRETE, EXCEPT AS SPECIFICALLY APPROVED BY THE EOR. IN WHICH CASE, THE PROPER KEYS, CUTOFFS, WATERSTOPS AND WATERPROOFING MUST BE PROVIDED.
9. SHOULD IT BECOME NECESSARY TO MOVE A BRACE, A NEW BRACE SHALL BE INSTALLED PROPERLY PRIOR TO REMOVAL OF THE ORIGINAL BRACE.

G. **EXCAVATION SUPPORT - COMPLETION**
1. ALL BRACING SHALL BE MAINTAINED UNTIL STRUCTURAL ELEMENTS ARE RE-BRACED BY OTHER BRACING OR UNTIL THE PERMANENT FLOOR CONSTRUCTION IS ABLE TO WITHSTAND THE LATERAL EARTH AND GROUND WATER PRESSURES.
2. SHEETING AND SHORING RETAINING EARTH ON WHICH THE SUPPORT AND/OR STABILITY OF EXISTING STRUCTURES IS DEPENDENT, MUST BE LEFT IN PLACE AT THE COMPLETION OF THE WORK, AND SHALL BE STEEL OR CONCRETE.
3. IF WOOD IS USED AS PART OF THE SHEETING, SHORING AND BRACING SYSTEM NEAR EXISTING STRUCTURES, IT MUST BE REMOVED PRIOR TO THE PLACEMENT OF BACKFILL OR SHALL BE TREATED WOOD TO PREVENT ROT.
4. IF REQUIRED, REMOVE SHEETING, SHORING AND BRACING IN A MANNER TO AVOID HARMFUL DISTURBANCE TO UNDERLYING SOILS AND DAMAGE TO BUILDINGS, STRUCTURES, PAVEMENTS, FACILITIES AND UTILITIES.
5. WHERE SHEETING IS ANCHORED TO THE SOILS IT RETAINS, ALL PRESTRESSED TIEBACK RODS SHALL BE RELIEVED OF STRESS AT THEIR ANCHORAGES ONCE NEW WALLS ARE POURED AND ARE SUPPORTED LATERALLY IN A PERMANENT MANNER BY THE NEW CONSTRUCTION.

ELEVATOR NOTES

A. **STANDARDS**
1. ALL ELEVATOR PIT/CORE WORK SHALL CONFORM TO THE APPLICABLE CONCRETE/MASONRY/STEEL WORK NOTES.

B. **PRODUCT DATA**
1. **SUBMITTALS:** CONTRACTOR SHALL SUPPLY ENGINEER OF RECORD SHOP DRAWINGS INDICATING ELEVATOR ARRANGEMENT, PIT REQUIREMENTS, SUMP REQUIREMENTS, MAINTENANCE ACCESS, RAIL/CAB/HOIST REACTION LOCATIONS/MAGNITUDES, WALL OPENING EXTENTS, HOIST BEAM, AND OVER RUN INFORMATION.
2. **BACKUP:** GENERAL CONTRACTOR SHALL ACCOUNT FOR COST OF RAIL BACKUP SUPPORT FOR SHAFT WALL TYPE ELEVATOR CORE CONSTRUCTION.
3. **MASONRY WALL LEAVE-OUTS:** ELEVATOR CORES HAVE BEEN DESIGNED FOR THE DOOR OPENINGS INDICATED PER PLAN ONLY. LINTELS AND WALL SEGMENTS ARE NOT RATED FOR INCREASED OPENINGS UNLESS COORDINATED WITH THE GENERAL CONTRACTOR PRIOR TO PIT AND WALL FABRICATION. IF ADDITIONAL CLEAR OPENINGS ARE NEEDED AT ANY LEVEL DUE TO ELEVATOR INSTALLATION THE ENGINEER OF RECORD MUST BE NOTIFIED OF THE REQUEST AND WALL/LINTEL/FOOTING MODIFICATIONS WILL BE PROVIDED.

STRUCTURAL DRAWINGS LIST

SHEET NUMBER	SHEET NAME	DD	CD
S001	GENERAL NOTES	X	X
S002	GENERAL NOTES CONT'D	X	X
S100	STRUCTURAL PLANS	X	X
S200	TYPICAL DETAILS	X	X
S301	FOUNDATION SECTIONS	X	X
S302	FRAMING SECTIONS		X

DATE	ISSUED FOR	REV
2026.01.20	DESIGN DEVELOPMENT	A
2026.03.04	BIDDING	B

Design Team

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Client
COUNTY OF DELAWARE DEPARTMENT OF PUBLIC WORKS

Project
VOTING MACHINE WAREHOUSE ELEVATOR ADDITION
403 EAST 24TH STREET, CHESTER, PA 19013

Drawing Title
GENERAL NOTES

Project No. IN2325-0323-00

Drawing No. **S001**

CONCRETE NOTES

A. **CODES / STANDARDS**
1. **STANDARDS:** CONCRETE WORK SHALL COMPLY WITH THE LATEST EDITIONS OF: ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE BUILDINGS"; ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"; AND ACI 315 "ACI DETAIL MANUAL", AND CRSI "MANUAL OF STANDARD PRACTICE".

2. **STEEL:** ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 AND DETAILED ACCORDING TO THE ACI *MANUAL OF STANDARD PRACTICE* (ACE 315 LATEST EDITION)
   - EPOXY COATED BARS SHALL BE COATED CONFORMING TO ASTM A775.
   - ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A1064.

3. **GROUT:** NON-SHRINK GROUT (NON-METALLIC) CRD-C-621, FACTORY PRE-MIXED GROUT SHALL BE "MASTERFLOW 713" BY MASTER BUILDERS OR APPROVED EQUAL. INSTALLATION AND CURING SHALL CONFORM TO SUPPLIER'S REQUIREMENTS. ALL GROUT SHALL EXPERIENCE NO SHRINKAGE AND HAVE A MAXIMUM OF 4.0% EXPANSION WHEN TESTED UNDER ASTM C-827 WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI WHEN TESTED PER ASTM C-109. GROUT SHALL HAVE A MINIMUM INITIAL SET TIME OF 60 MINUTES WHEN TESTED PER ASTM C-191.

4. **CURING:** CURE CONCRETE IMMEDIATELY AFTER FINISHING PER ACI 301, ACI 305R, ACI 306R, AND ACI 308.

B. **SHOP DRAWINGS / SUBMITTALS**
1. **SHOP DRAWINGS** INCLUDING THE FOLLOWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO ANY FABRICATION.
   - REINFORCING DETAILS INCLUDING CONCRETE COVER, STEEL SIZES, BEND TYPES, LAPS AND DIMENSIONS
   - LOCATIONS OF ALL ANCHOR BOLTS, CONTROL JOINTS, CURBS, SLAB, DEPRESSIONS, SLEEVES, INSERTS, BOXES, OPENINGS, ETC.
   - LOCATIONS OF ALL CONSTRUCTION JOINTS; ENGINEER MAY REQUIRE ADDITIONAL REINFORCING AT CONSTRUCTION JOINTS.

2. **FORMWORK** CALCULATIONS PREPARED AND SEALED, IN WRITING, BY A REGISTERED PROFESSIONAL ENGINEER HIRED BY THE CONTRACTOR.

3. **DESIGN MIXES** FOR EACH TYPE AND STRENGTH OF CONCRETE SHALL BE SUBMITTED BY EITHER LABORATORY TRAIL BATCH OR FIELD METHODS SPECIFIED IN ACI 301. MIX DESIGNS SHALL BE PREPARED BY AN INDEPENDENT TESTING FACILITY AND SHALL NOT BE SAME AS USED FOR FIELD TESTING.

4. **MASS CONCRETE** DEFINED AS A PLACEMENT OF STRUCTURAL CONCRETE WITH A MINIMUM DIMENSION EQUAL TO OR GREATER THAN 4 FT. THERMAL CONTROL PLAN SHALL BE PREPARED AND EXECUTED PER SECTION 8 OF ACI 301 AND ACI 207. THE OWNER'S CONCRETE TESTING LABORATORY IS RESPONSIBLE FOR INSTALLING AND MONITORING OF THERMOCOUPLES.

5. NO CONCRETE WORK SHALL COMMENCE WITHOUT APPROVED SHOP DRAWINGS.

C. **CONCRETE MIX INFORMATION**
1. **FREEZE-THAW:** ALL CONCRETE EXPOSED TO FREEZING AND THAWING SHALL BE NORMAL WEIGHT (ASTM C33) READY MIX CONCRETE (ASTM C94).

2. **CONCRETE STRENGTH & MIX DESIGN:** ALL CAST-IN-PLACE CONCRETE SHALL CONFORM TO THE FOLLOWING: 1" MIN. SLUMP, A/C (AIR CONTENT) BASED ON 3/4" AGGREGATE, NORMAL WEIGHT UNLESS NOTED OTHERWISE.

LOCATION:	f'c @ 28 DAYS	A/C	MAX W/C
• FOUNDATION WALLS/PIERS	5,000 PSI	6%	0.45
• MAT FOUNDATIONS	4,000 PSI	2%	0.55
• FOOTINGS	3,500 PSI	2%	0.55
• INTERIOR SLAB ON GRADE	3,500 PSI	2%	0.55
• LW SLABS ON METAL DECK	4,000 PSI	4-7%	0.55

2% A/C INDICATES ENTRAPPED AIR IN NON-AIR ENTRAINED CONCRETE.

1. **CALCIUM CHLORIDE:** NO CALCIUM CHLORIDE SHALL BE USED IN ANY CONCRETE.

A. **REINFORCEMENT**
1. **REINFORCEMENT** SHALL NOT BE FIELD CUT, UNLESS OTHERWISE INDICATED. REINFORCEMENT SHALL BE COLD BENT. HEATING REINFORCEMENT IS PROHIBITED. RE-BENDING REINFORCING IS PROHIBITED.

2. **BAR SUPPORT:** PROVIDE BAR SUPPORTS AND SPACERS PER ACI 315 AND CRSI "*MANUAL OF STANDARD PRACTICE.*" ALL BAR SUPPORTS IN CONTACT WITH EXPOSED SUBSURFACE SHALL HAVE PLASTIC TIPPED FEET. CONTRACTOR MUST EXERCISE CARE TO PREVENT EXPOSURE OF TIE WIRED OR OTHER MATERIALS THAT MAY STAIN EXPOSED CONCRETE. ALL REINFORCEMENT SHALL MAINTAIN PROPER COVER AND SECURELY HELD IN PLACE DURING CONCRETE PLACEMENT.

3. **MINIMUM CONCRETE COVER** FOR REINFORCING STEEL SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

• ALL CONCRETE PERMANENTLY CAST AGAINST EARTH	3"
• ALL CONCRETE EXPOSED TO EARTH/WEATHER (≥ #6)	2"
• ALL CONCRETE EXPOSED TO EARTH/WEATHER (≤ #5)	1 1/2"
• SLAB ON GRADE (WELDED WIRE FABRIC)	2"
• BEAM STIRRUPS, COLUMN & PIER TIES, NOT EXPOSED	1 1/2"
• SLABS, WALLS & JOISTS, NOT EXPOSED (≤ #11)	3/4"
• CONCRETE ON METAL DECK, NOT EXPOSED	1"

4. **WELDED WIRE FABRIC** (WWF) SHALL BE PROVIDED IN FLAT SHEETS SUPPORTED ON CONTINUOUS SLAB BOLSTERS AND LAPPED 1.5 X MESH SPACES OR MINIMUM OF 6".

5. **DEVELOPMENT & LAP SPLICE TABLE:** ALL LAP SPLICES SHALL BE CLASS "B", UNLESS NOTED OTHERWISE.

	TENSION LAP SPLICE		COMPRESSION	
BAR	CLASS "A"	CLASS "B"	DOWEL EMBED.	LAP SPLICE
	1.0*Ld	1.3*Ld	22*db	30*db
#3	15	19	9	12
#4	19	27	11	15
#5	25	31	14	19
#6	29	38	17	23
#7	43	55	19	26
#8	48	63	22	30
#9	54	71	25	34
#10	61	80	28	38

TABULATED VALUES ARE BASED ON THE FOLLOWING ASSUMPTIONS
- NORMAL WEIGHT & 4,000 PSI CONCRETE STRENGTH
- A MINIMUM CLEAR COVER AS SHOWN IN GENERAL NOTES.
- A MINIMUM CLEAR SPACING OF 3" BETWEEN ANY BARS.

MULTIPLY THE TABULATED TENSION SPLICE VALUES BY MODIFICATION FACTORS BELOW AS APPLICABLE FOR OTHER CONCRETE TYPES, STRENGTHS AND CONDITIONS. MODIFICATION FACTORS ARE CUMULATIVE. TENSION SPLICE LENGTH SHALL NOT BE LESS THAN 12".
- F'c= 3 ksi, x 1.16
- F'c= 5 ksi, x 0.90
- LIGHT WEIGHT CONCRETE, x1.3
- EPOXY-COATED BARS, x1.5
- CLEAR SPACING < 2*db & CLEAR OVER < db, x1.5

E. **POST-INSTALLED ANCHORS**
- **REBAR:** WHEN INSTALLING ANCHORS CONTRACTOR SHALL TAKE MEASURES TO AVOID DRILLING/CUTTING ANY EXISTING REINFORCEMENT AND DESTRUCTION OF CONCRETE. HOLES SHALL BE CLEANED PER SUPPLIER REQUIREMENTS PRIOR TO SETTING/PLACEMENT.
- **EXPANSION BOLTS** SHALL CONFORM TO HILTI KWIK BOLT TZ OR APPROVED EQUAL UNLESS NOTED OTHERWISE.
- **ADHESIVE ANCHORS** SHALL CONFORM TO HILIT HY-200 ADHESIVE ANCHORING SYSTEM OR APPROVED EQUAL WITH THREADED ROD A193 GRADE B7.

F. **PLACEMENT**
1. **OPENINGS AND PENETRATION LOCATION AND DIMENSIONS** SHALL BE VERIFIED AND COORDINATED BEFORE THE CONCRETE IS POURED. MINIMUM DISTANCE BETWEEN SLEEVES IS THE GREATER OF SLEEVE DIAMETER OR 6 INCHES. OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS REQUIRE APPROVAL FROM STRUCTURAL ENGINEER IN WRITING PRIOR TO FIELD CUTTING/CORING SINCE ADDITIONAL REINFORCEMENT MAY BE REQUIRED.

2. **CHAMFER:** EXPOSED EDGES SHALL BE CHAMFERED 1/2", UNLESS NOTED OTHERWISE.

3. **EMBEDDED ITEMS** SHALL BE COORDINATED WITH OTHER TRADE DOCUMENTATION BY THE CONTRACTOR. NO CONDUITS MAY BE EMBEDDED IN CONCRETE. SET AND BUILD ANCHOR DEVICES AND EMBEDDED ITEMS REQUIRED FOR OTHER WORK THAT IS ATTACHED TO OR SUPPORTED BY CAST-IN-PLACE CONCRETE. USE SETTING DIAGRAMS, TEMPLATES, AND INSTRUCTIONS PROVIDED BY OTHERS FOR LOCATION AND SETTING.

4. **FLOOR SLABS:**
   a. **COORDINATION:** CONTRACTOR SHALL COORDINATE DEPRESSIONS FOR FLOOR FINISHES, FLOOR DRAINS, CURBS, CONCRETE PADS, INSERTS, AND WELDED PLATES WITH ALL OTHER TRADE DOCUMENTATION.

   b. **28-DAY STRENGTH** SHALL BE ATTAINED BEFORE POURING ANY TOPPING SLAB, OR BEFORE ANY MASONRY OR CONCRETE WALL IS ERECTED ON TOP.

   c. **FLATNESS & LEVELNESS** OF CONCRETE FLOOR SHALL BE AS FOLLOWS U.N.O.
      - SLAB ON GRADE: F(F) 35, F(L) 25, MINIMUM LOCAL F(F)=24, F(L) 18
      - ELEVATED FLOOR: F(F) 30

   d. THE CONTRACTOR SHALL PROVIDE CORRECTIVE MEASURES TO MEET REQUIREMENTS FOR ASTM E1155 AND PROJECT SPECIFIC PARTITIONS.

5. **COLD JOINTS** SHALL BE ROUGHENED TO AN AMPLITUDE OF 1/4 INCH FOR THE ENTIRE INTERSECTING SURFACE ACCORDING TO ACI RECOMMENDATIONS AND APPLY A BONDING AGENT AS REQUIRED. DO NOT LOCATE CONSTRUCTION JOINTS (COLD JOINTS) BELOW TERRAZZO FLOOR FINISHES.

6. **WALL JOINTS:**
   - **EXPANSION:** WALLS EXCEEDING 90 FEET SHALL CONTAIN EXPANSION JOINTS AT 90 FEET ON CENTERS.
   - **CONTROL JOINTS:** SHALL BE LOCATED AT RECOMMENDED SPACING BELOW, AT ABRUPT CHANGES IN WALL HEIGHT OR THICKNESS, BUT NOT EXCEEDING 30' - 0" O.C.

WALL HEIGHT	RECOMMENDED SPACING
• 8 FT OR LESS	3X WALL HEIGHT
• BETWEEN 8 FT AND 12 FT	2X WALL HEIGHT
• 12 FT OR GREATER	1X WALL HEIGHT

   - **CONSTRUCTION JOINTS**: SHALL BE LOCATED AT:
   - 60' - 0" O.C. MAXIMUM FOR NON-EXPOSED WALLS
   - 30' - 0"' O.C. MAXIMUM FOR EXPOSED WALLS
   - NOT LESS THAN 4' - 0" AWAY FROM FACE OF SUPPORTIVE PIER, BUTTRESS OR WALL OPENINGS.
     - **CORNERS:** JOINTS SHALL BE LOCATED NO FURTHER THAN 15'-0" FROM CORNERS.

7. **HORIZONTAL JOINTS** ARE NOT PERMITTED IN BEAMS, WALLS, AND SLABS UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER PRIOR TO CONSTRUCTION.

G. **FORMWORK AND SHORING**
1. FORMWORK SHALL CONFORM TO THE LATEST EDITIONS OF ACI SPECIAL PUBLICATION NO. 4 "FORMWORK FOR CONCRETE" AND ACI 347 "STANDARD RECOMMENDED PRACTICE FOR CONCRETE FORMWORK".

2. SUBMIT FORMWORK AND SHORING DESIGN AND DETAIL DRAWINGS CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.

3. LOADS GREATER THAN THE DESIGN LIVE LOADS SHALL NOT BE PLACED ON ANY PART OF THE STRUCTURE.

4. SHORING AND WALL BRACING SHALL REMAIN UNTIL AT MINIMUM 75% OF 28-DAY DESIGN STRENGTH IS REACHED.

5. UNTIL THE CONCRETE HAS ATTAINED FULL 28-DAY DESIGN STRENGTH AND VERIFIED BY AN APPROPRIATE ASTM STANDARD TEST METHOD,
   - DO NOT REMOVE FORMWORK OR SHORING OF HUNG STRUCTURE BELOW. RE-SHORE HUNG STRUCTURE AS NEEDED.
   - DO NOT REMOVE RE-SHORING.
   - DO NOT PLACE FULL DESIGN LOAD ON THE STRUCTURE.
   - DO NOT PLACE MASONRY WALLS, PARAPETS, ETC. ON ANY PART OF THE STRUCTURE.

6. AT LEAST 1 FLOOR SHALL BE FULLY FORMED AND SHORED WITH A MINIMUM OF 3 FLOORS BELOW RE-SHORED AT ANY GIVEN TIME. ADDITIONAL SHORING AND RE-SHORING SHALL BE PROVIDED AS INDICATED BY THE SHORING DESIGN REQUIREMENTS.

7. RE-SHORE POSTS SHALL BE PLACED AT THE INTERSECTION OF THE COLUMN AND MIDDLE STRIP LINES IN EACH DIRECTION, WITH INTERMEDIATE POSTS AS REQUIRED. VERTICALL ALIGN RE-SHORES TO PROVIDE CONTINUOUS SUPPORT FROM FLOOR TO FLOOR. RE-SHORES MUST BE SNUG TO SLABS, BUT NOT TIGHT ENOUGH TO ADD ADDITIONAL LOADS. RE-SHORING SHALL SUPPORT EACH PANEL INDEPENDENTLY AS IT IS STRIPPED BEFORE REMOVING FORMS FROM ADJACENT PANELS OR RE-STORES SHALL BE INSTALLED PRIOR TO REMOVAL OF SHORES AND FORMWORK.

H. **FIELD TESTING**
1. UNLESS OTHERWISE PER CONTRACT DOCUMENTS, CAST THREE (3) CONCRETE TEST CYLINDERS (4" DIA x 8" HIGH) FOR EACH 50 CUBIC YARDS OF CONCRETE PLACED FOR TESTING AT 7, 14 AND 28 DAYS AND ONE SET OF ONE CYLINDER FOR 56 DAY VERIFICATION. ADDITIONAL CYLINDERS MAY BE TAKEN AND TESTED FOR HIGH EARLY STRENGTH REQUIREMENTS SHOULD THE CONTRACTOR REQUIRE THEM (IE WALL STRENGTH OR SHORING REMOVAL).

2. AT THE TIME OF CASTING EACH SET OF TEST CYLINDERS, SAMPLE CONCRETE PER ASTM C172 AND MEASURE THE FOLLOWING AT THE POINT OF CONCRETE PLACEMENT:
   - AMBIENT TEMPERATURE
   - CONCRETE TEMPERATURE
   - UNIT WEIGHT PER ASTM C-138
   - SLUMP PER ASTM C-143
3. AIR CONTENT PER ASTM C-173 OR ATM C-231

4. EVALUATE SLAB FLOOR FLATNESS AND PER ASTM E1155.

5. POST-INSTALLED ANCHORS SHALL BE INSPECTED PER IBC SPECIAL INSPECTION REQUIREMENTS AND BE CONTINIOUSLY INSPECTED DURING PLACEMENT.

STEEL FRAMING NOTES

A. **STANDARDS**
1. DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH "THE STEEL CONSTRUCTION MANUAL", 15TH EDITION, BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.

B. **SHOP DRAWINGS / SUBMITTALS**
1. **SHOP DRAWINGS** INCLUDING THE FOLLOWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO ANY FABRICATION
   - COMPLETE DETAILS FOR FABRICATION, ASSEMBLY AND ERECTION.
   - A STEEL ERECTION PROCEDURE PREPARED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER HIRED BY THE CONTRACTOR. THIS PROCEDURE MUST INCLUDE THE PROPOSED SURVEY PER STEEL SPECIFICATIONS.
   - ANCHOR BOLT PLACEMENT SHALL BE FIELD SURVEYED PRIOR TO COLUMN/ BASE PLATE SHOP DRAWING PREPARATION/SUBMITTAL. SHOP DRAWINGS SHALL REFLECT INSTALLED ANCHOR BOLT CONDITIONS.
   - ALL GRADE CERTIFICATIONS FOR RECORD.

C. **MATERIAL INFORMATION**
1. MATERIAL SCHEDULE

ELEMENT	ASTM	YIELD STRENGTH
W-SHAPES, TEES	A992	50 KSI
CHANNELS, ANGLES, PLATES AND BARS	A36	36 KSI
HSS (RECT. & SQUARE)	A500 Gr. C	50 KSI
BOLTS	F3125 Gr. A325	92 KSI
WASHERS	F436	-
NUTS	A563 Gr. B	-

2. **SHOP PAINT** SHALL CONFORM TO SSPC-PS 1.10, PAINT 25, RED IRON OXIDE; SURFACE PREPARATIONS SHALL CONFORM TO SSPC-SP-3. SURFACES TO RECEIVE SPRAY ON FIRE PROOFING, SURFACES TO BE ENCASED IN CONCRETE AND SURFACES OF CONNECTING ELEMENTS IN SLIP-CRITICAL CONNECTIONS SHALL NOT BE PAINTED. PAINT SHOULD BE MODIFIED AS REQUIRED WITH NO ADDITIONAL COST TO THE OWNER. FIELD PAINT PER ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

3. **GALVANIZED STEEL:** GALVANIZED STEEL AND ITS CONNECTORS SHALL CONFORM TO ASTM A123, ASTM A153, ASTM A384 AND THE RECOMMENDATIONS OF THE "AMERICAN HOT DIP GALVANIZERS ASSOCIATION STANDARD SPECIFICATIONS". FINISH PIECES SHALL CONFORM TO AISC "MANUAL OF STEEL CONSTRUCTION". ABRADED, SCRAPED AND FIELD WELDED AREAS SHALL BE TOUCHED UP WITH A SUITABLE ZINC RICH PAINT.

D. **FABRICATION/ERECTION**
1. **FILLER BEAM SPACING:** SHALL BE EQUAL BETWEEN SUPPORTS U.N.O.

2. **DECK SUPPORT ANGLES** SHALL BE PROVIDED BY THE STRUCTURAL STEEL CONTRACTOR AS REQUIRED.

3. **ANCHOR ROD LAYOUT:** RIGID STEEL TEMPLATES FOR ANCHOR ROD INSTALLATION SHALL BE SUPPLIED BY THE STRUCTURAL STEEL CONTRACTOR

4. **GALVANIZED ELEMENTS:** HOT-DIP GALVANIZE ALL STEEL LINTELS AND SHELF ANGLES, DUNNAGE STEEL OR OTHER STEEL EXPOSED TO THE EXTERIOR. STEEL SURFACES THAT ARE EXPECTED TO CONTACT ALUMINUM SHALL BE PROPERLY SEPARATED OR TREATED. BOLTS, NUTS, AND WASHERS FOR STEEL PERMANENTLY EXPOSED TO WEATHER SHALL BE GALVANIZED.

5. **TEMPORARY BRACING:** CONTRACTOR SHALL PROVIDE ADDITIONAL STEEL, GUYING, CONNECTIONS, BRACING REQUIRED FOR ERECTION AT NO ADDITIONAL COST.

6. **DRAINAGE:** PROVIDE HOLES IN ALL STEEL AS REQUIRED TO PREVENT ANY ACCUMULATION OF WATER DURING ERECTION. ALL PENETRATIONS THROUGH MAIN MEMBERS SHALL NOT EXCEED 1"Ø AND SHALL BE GROUND SMOOTH. THESE DRAWINGS MUST BE KEPT CLEAN AND OPEN.

7. **THERMAL CUTTING:** ALL HOLES AND CUTS SHALL BE SHOWN IN THE SHOP DRAWINGS AND MADE IN THE SHOP. BURNING OR CUTTING OF HOLES IN STRUCTURAL STEEL IN THE FIELD IS NOT PERMITTED WITHOUT APPROVAL OF EOR.

8. **FIELD ADJUSTABILITY:** SPANDREL ANGLE AT PERIMETER EDGE OF FLOOR SLAB/ROOF SHALL BE ADJUSTABLE. SHIP ANGLE LOOSE AND SET WITH STRING LINE IN FIELD FOR VERTICAL AND HORIZONTAL ALIGNMENT AFTER STEEL IS FULLY ERECTED TO A MAXIMUM TOLERANCE OF 1/4" HORIZONTAL PER FLOOR AND MUST BE SET PLUMB BY STEEL ERECTOR PRIOR TO STUD/CLADDING ERECTION. ANGLE MUST BE INSTALLED IN ONE LENGTH PER BAY.

9. **CANTILEVER BEAMS:** ALL STEEL CANTILEVER BEAMS MUST BE PLUM PRIOR TO COMPLETING MOMENT CONNECTIONS.

10. **STIFFENING:** PROVIDE WEB STIFFENER PLATES ON BOTH SIDES OF THE WEB FOR BEAMS AT POINTS OF CONCENTRATED LOADS INCLUDING BEAMS SUPPORTING COLUMNS OR RUNNING OVER THE TOPS OF COLUMNS. MINIMUM STIFFENER PLATE THICKNESS SHALL BE 3/8 INCH OR FLANGE THICKNESS OF COLUMN ABOVE OR BELOW OR BEAM WEB THICKNESS ABOVE OR BELOW, WHICHEVER IS GREATER.

11. **CAMBER:** BEAMS AND TRUSSES WITHOUT SPECIFIED CAMBER SHALL BE FABRICATED SO THAT AFTER ERECTION ANY CAMBER DUE TO ROLLING OR SHOP ASSEMBLY SHALL BE UPWARD. ELEMENTS WITH NATURAL CAMBER SHALL BE ASSEMBLED UPWARD. PROVIDED ADDITIONAL CAMBERS AS INDICATED PER PLANS.

12. **SPLICING:** MEMBERS MAY BE SPLICED ONLY WHERE SPECIFICALLY DETAILED ON APPROVED SHOP DRAWINGS, SUBMIT PROFESSIONAL ENGINEER'S SIGNED AND SEALED CALCULATIONS WITH THE SPLICE DETAILS. WHERE STEEL MEMBERS ARE REQUIRED TO BE SPLICED, THE SPLICE SHALL DEVELOP THE FULL STRENGTH OF THE SECTION. SUCH SPLICES SHOULD NOT INTERFERE WITH ANY ARCHITECTURAL OR MECHANICAL DESIGN OR CLEARANCES.

13. **CONCRETE ENCASED STEEL** SHALL BE UNPAINTED ON THE CONTACT SURFACES AND WRAPPED WITH A MINIMUM WWF6X6-W2.9XW2.9 REINFORCING U.N.O.

E. **STEEL CONNECTIONS**
1. **DETAILS:** ALL DETAILS ARE CONCEPTUAL ONLY AND DO NOT INDICATE THE REQUIRED NUMBER OF BOLTS OR WELD SIZES, U.N.O. REFERENCE DELEGATED DESIGN SUBMITTALS SECTION UNDER GENERAL NOTES.

2. **SHEAR CAPACITY** SHALL BE THE LARGEST REACTION VALUE OF THE FOLLOWING:
   - HALF OF TOTAL UNIFORM LOAD CAPACITY OF THE BEAM SHAPE FOR THE SPAN, WITH THE EFFECT OF CONCENTRATED LOADS.
   - THE ULTIMATE REACTIONS INDICATED ON PLAN
   - 15 KIPS.

3. **BOLTED CONNECTIONS**:
   A. **MINIMUM** OF TWO (2) 3/4"Ø BOLTS TO BE PROVIDED PER CONNECTION.
   B. **FLOOR BEAM CONNECTIONS**: SHALL BE FULL DEPTH DOUBLE ANGLES WITH 3/4"Ø A325-N BOLTS SPACED AT 3" O.C. AT ALL CONNECTIONS U.N.O
   C. **BOLT HOLES**: OVERSIZED OR VERTICAL SLOT HOLES SHALL NOT BE USED FOR ANY CONNECTIONS U.N.O. OR APPROVED IN WRITING BY THE E.O.R.
   D. **JOINT TYPES**
      a. **PRETENTIONED** BOLTS SHALL BE PROVIDED PER FIELD TESTING NOTES SECTION AT FOLLOWING LOCATIONS:
         - BEAM-TO-COLUMN MOMENT CONNECTIONS
         - BEAM-TO-GIRDER MOMENT CONNECTIONS
         - WEB SHEAR CONNECTIONS FOR MOMENT CONNECTIONS
         - LATERAL BRACE CONNECTIONS
         - COLUMN SPLICES
      b. **SLIP-CRITICAL** BOLTS SHALL BE PROVIDED AT:
         - ALL MOMENT CONNECTION FLANGE PLATES
         - OVERSIZED HOLES
   E. **ALL OTHER** BOLTS SHALL BE TIGHTENED TO "SNUG TIGHT" CONDITION U.N.O.

4. **WELDED CONNECTION:** WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1.
   - ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
   - ALL WELDED CONNECTIONS SHALL BE E70XX ELECTRODES.
   - NO WELD TO BE LESS THAN 1/4" UNLESS NOTED OTHERWISE.
   - ALL BUTT AND FULL PENETRATION WELDS SHALL HAVE RUN OFF TABS THAT SHALL BE REMOVED & GROUND SMOOTH ONLY WHERE NOTED.
   - ALL WELD BACK UP BARS SHALL BE REMOVED & GROUND SMOOTH ONLY WHERE NOTED
   - ALL STEEL MARKED AS AESS (ARCHITECTURALLY EXPOSED STRUCTURAL STEEL) NEEDS TO BE GROUND SMOOTH.

5. **PIPE / HSS CONNECTIONS:** PIPE OR TUBE COLUMN CONNECTIONS SHALL EMPLOY A MINIMUM 3/8" THICK, FULL DEPTH, THROUGH-PLATE (KNIFE PLATE).

6. **ALTERNATE CONNECTIONS** WILL BE ACCEPTED ONLY WITH THE PRIOR APPROVAL BY THE E.O.R. CONTRACTOR'S BID SHALL ANTICIPATE THE USE OF SPECIFIC DETAILS SHOWN ON THE DRAWINGS. IN ANY EVENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF SUCH ALTERNATE DETAILS THEY PROPOSE.

F. **FIELD TESTING**
1. **INSPECTIONS:** THE STRUCTURAL STEEL FABRICATOR AND ERECTOR SHALL SCHEDULE ALL WORK TO ALLOW COMPLETION OF INSPECTION AND TESTING REQUIREMENTS, AND APPLICABLE THIRD PARTY INSPECTION ITEMS.

2. **BOLTED CONNECTIONS:** COMPONENTS AND FASTENERS IN SLIP CRITICAL CONNECTIONS, SHALL BE VISUALLY INSPECTED FOR TIGHTNESS PER AISC SPECIFICATIONS FOR STRUCTURAL JOINTS.
   A. ALL SLIP CRITICAL (S.C.) BOLTED CONNECTIONS SHALL BE CHECKED AND INSPECTED USING ONE OF THE FOLLOWING:
      - TURN OF THE NUT
      - CALIBRATED WRENCH
      - ALTERNATE DESIGN FASTENER
      - DIRECT TENSION INDICATOR

   B. CHECK 25% OF BOLTS IN EACH NON-SLIP CRITICAL SHEAR CONNECTIONS - MINIMUM OF (2) - BY CALIBRATED TORQUE WRENCH

3. **FIELD WELDED CONNECTIONS** SHALL BE TESTED PER ANSI / AWS D1.1, CHAPTER 6.

MASONRY NOTES

A. **CODES / STANDARDS**: ALL CONCRETE MASONRY CONSTRUCTION SHALL COMPLY WITH:
   - THE "SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF LOAD-BEARING CONCRETE MASONRY" PUBLISHED BY THE NATIONAL CONCRETE MASONRY ASSOCIATION.
   - BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES"- ACI 530/ASCE 5-05/TMS 402 AND ACI 530.1/ASCE 6-05/TMS 602.

B. **SHOP DRAWINGS / SUBMITTALS**
1. REFER TO SPECIFICATIONS FOR SUBMITTAL REQUIREMENTS.

C. **MATERIAL INFORMATION**
1. **f 'm PRISM STRENGTH:** MASONRY ASSEMBLY SHALL HAVE A NET AREA COMPRESSIVE STRENGTH (f 'm) OF **2,500 PSI** MINIMUM.

2. **BLOCK MATERIAL:** ALL CONCRETE MASONRY UNITS SHALL BE NORMAL WEIGHT, GRADE N, COMPLYING WITH ASTM C90. NET AREA COMPRESSIVE STRENGTH OF INDIVIDUAL CONCRETE MASONRY UNIT SHALL BE **3,250 PSI** MINIMUM.

3. **MORTAR:** MORTAR FOR ALL CONCRETE MASONRY MUST BE **TYPE S** CEMENT-LIME MORTAR PER ASTM C270.

4. **GROUT:** GROUT FOR GROUT FILLED MASONRY SHALL BE A HIGH SLUMP MIX CONFORMING TO ASTM C476 AND SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS FROM FIELD OBTAINED TEST CYLINDERS.

5. **JOINT REINFORCEMENT:** CONCRETE MASONRY UNITS SHALL BE CONSTRUCTED WITH HORIZONTAL JOINTS REINFORCED WITH HOT-DIPPED GALVANIZED LADDER TYPE REINFORCEMENT (ASTM A153 CLASS B-2).

6. **REINFORCEMENT:** SEE CONCRETE NOTES FOR REINFORCING STEEL REQUIREMENTS, STANDARDS AND SPECIFICATIONS FOR ADDITIONAL NOTES. PROVIDE LAP SPLICES IN ACCORDANCE WITH THE TYPICAL MASONRY LAP SPLICE DETAIL FOR ALL REINFORCEMENT.

7. **BRICK MASONRY:** ALL BRICK MASONRY UNITS SHALL BE GRADE SW PER ASTM C216 WITH A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AND BONDED TOGETHER WITH TYPE S MORTAR.

D. **PLACEMENT**: LAY CONCRETE MASONRY UNITS AS FOLLOWS:
   A. GROUT SOLID ALL MASONRY BELOW GRADE.

   B. GROUT SOLID MINIMUM OF (2) COURSES BELOW ALL BEARING POINTS ON CMU WALL INCLUDING STAIR STRINGERS, LANDING BEAMS, AND ELEVATOR HOIST AND DIVIDER BEAMS.

   C. WITH FULL BED OF MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS FOR HOLLOW MASONRY UNITS/CAVITIES.

   D. BED WEBS IN MORTAR IN STARTING COURSE ON FOOTING AND IN ALL COURSES OF PIERS, COLUMNS AND PILASTERS, AND WHERE ADJACENT TO CELLS OR CAVITIES TO BE FILLED WITH GROUT.

   E. FOR STARTING COURSE ON FOOTING WHERE CELLS ARE NOT GROUTED, SPREAD OUT FULL MORTAR BED INCLUDING AREAS UNDER CELLS.

   F. MAINTAIN JOINT WIDTHS INDICATED, EXCEPT FOR MINOR VARIATIONS REQUIRED TO MAINTAIN BOND ALIGNMENT. IF NOT INDICATED, LAY WALLS WITH 3/8" JOINTS.

   G. USE THE "HIGH LIFT" GROUTING METHOD WITH MAXIMUM LIFT HEIGHTS OF 48".

   H. GROUT SHALL BE USED AS FILLING FOR VERTICAL CAVITIES, BOND BEAMS, LINTELS AND HOLLOW MASONRY UNITS DESIGNATED AS SOLID GROUTED IN THE DRAWINGS. MORTAR **SHALL NOT** BE USED TO FILL CELLS.

   I. ALL CUTTING OF MASONRY SHALL BE DONE WITH MASONRY SAWS.

   J. WALLS SHALL BE PROPERLY BRACED AGAINST LATERAL LOADS UNTIL THE PERMANENT LATERAL BRACES OR OTHER LATERAL SUPPORT SYSTEMS HAVE BEEN INSTALLED.

   K. CONCRETE MASONRY SHALL BE PROTECTED FROM ABSORBING MOISTURE AND WATER WHILE AT THE PLANT, DURING SHIPMENT, AND AT THE SITE DURING CONSTRUCTION.

   L. MASONRY FACADE SUSPENDED FROM OR SUPPORTED ON CONCRETE SLABS AND BEAMS SHALL NOT BE ERECTED UNTIL PERMANENT ALIGNMENT AND ANCHORAGE OF SHELF ANGLES AND SUSPENDED HARDWARE IS COMPLETED, ALL TEMPORARY AND PERMANENT BRACING (WHERE REQUIRED) IS INSTALLED AND ALL SHORES AND RE-SHORES ARE REMOVED. MASONRY SUPPORTED BY STEEL MEMBERS SHALL NOT BE ERECTED UNTIL PERMANENT ANCHORAGE AND BRACING SYSTEMS HAVE BEEN INSTALLED.

E. **WALL JOINTS**
1. PROVIDE VERT. CONTROL JOINTS IN BEARING & NON-LOAD BEARING CONCRETE MASONRY WALLS AT FOLLOWING:
   - SPACED 25' - 0" O.C. MAXIMUM THROUGHOUT LENGTH OF WALL
   - AT CHANGES IN WALL HEIGHT OR THICKNESS
   - AT PILASTERS, PIERS OR COLUMNS
   - ADJACENT TO CORNERS AND INTERSECTIONS (WITHIN 12' - 6")
   - AT OPENINGS WITH MASONRY LINTELS AT LEAST 2' - 0" AWAY EA. SIDE
   - AT EACH END OF STEEL LINTELS (ABOVE ONLY).

2. CONTROL JOINTS SHALL EXTEND THROUGH ENTIRE WALL THICKNESS FOR FULL WALL HEIGHT.

3. BOND BEAM REINFORCEMENT TO BE CONTINUOUS, WRAP BARS IN GREASE COATED WRAP OR PROIVDE JOINT STABILZER ANCHORS.

4. HORIZONTAL JOINT REINFORCEMENT SHALL BE INTERRUPTED.

F. **VERTICAL REINFORCEMENT**
1. PROVIDE VERTICAL REINFORCEMENT IN GROUTED CELLS AS FOLLOWS:
   - MINIMUM WALL REINFORCEMENT OF #4@48" O.C SHALL BE PROVIDED. SEE DETAILS AND SHEET NOTES FOR INCREASED REINFORCEMENT BASED ON SPAN/LOADING.
   - VERTICAL REINFORCING SHALL BE ANCHORED INTO SUPPORTING SLAB OR BEAMS BELOW WITH TENSION EMBEDMENT LENGTH.
2. ALL OTHER INTERIOR NON-LOAD BEARING WALLS SHALL BE DETAILED AND REINFORCED PER THE TYPICAL DETAILS SHEET.

G. **HORIZONTAL REINFORCEMENT**
1. PROVIDE JOINT REINFORCEMENT AS FOLLOWS:
   - 8" CMU: LADDER REINFORCEMENT WITH 9 GAUGE SIDE RODS AND CROSS RODS.
   - 12" CMU: LADDER REINFORCEMENT WITH 3/16"Ø SIDE RODS AND 9 GAUGE CROSS RODS.

2. **LOCATIONS**: JOINT REINFORCEMENT SHALL BE PROVIDED AT FOLLOWING: COORDINATE WITH CONTROL JOINT LOCATIONS ON ARCHITECTURAL AND STRUCTURAL DRAWINGS.
   - TYPICAL 16" O.C. CONTINUOUS AT ALL CMU WALLS (U.N.O. AT SHEAR WALLS)
   - AT FLOOR OR ROOF: @ 8" O.C. FOR 3 COURSES
   - AT PARAPETS: @ 8" O.C.
   - AT CORNERS & T INTERSECTIONS: 2' - 8" LONG E.W. @ 8" O.C. REINFORCEMENT SHALL BE SHOP FABRICATED AND CONTINUOUS AROUND ALL CORNERS AND AT INTERSECTIONS.
   - AT HORIZONTAL JOINTS

3. **PLACEMENT**:
   - REINFORCEMENT SHALL BE COMPLETELY EMBEDDED IN MORTAR WITH A MINIMUM COVER OF 5/8" WHEN EXPOSED TO EARTH OR WEATHER AND 1/2" WHEN NOT EXPOSED TO EARTH OR WEATHER.
   - REINFORCEMENT TO BE FURNISHED IN 10 TO 20 FEET LENGTH FLAT SECTIONS.
   - THE DISTANCE BETWEEN WELDED CONTACTS OF CROSS RODS (DIAGONALS) WITH EACH LONGITUDINAL WIRE SHALL NOT EXCEED 6" AND 16" FOR SMOOTH AND DEFORMED LONGITUDINAL WIRES RESPECTIVELY.

H. **TIES:** ADJUSTABLE ANCHORS FOR ATTACHING MASONRY VENEER TO THE STRUCTURAL FRAME OR WALL SHALL CONFORM TO:
1. TWO-PIECE ASSEMBLIES ALLOWING VERTICAL AND HORIZONTAL DIFFERENTIAL MOVEMENT BETWEEN WALL AND FRAME WORK PARALLEL TO PLANE OF WALL, BUT RESISTING TENSION OR COMPRESSION FORCES PERPENDICULAR TO IT

2. IT MUST BE CAPABLE OF WITHSTANDING A 100 LB LOAD IN EITHER TENSION OR COMPRESSION WITHOUT DEFORMING, OR DEVELOPING PLAY IN EXCESS OF 0.05 OF AN INCH.

3. SPACE ADJUSTABLE TIES AT 16" ON CENTER VERTICALLY AND HORIZONTALLY.

I. PROVIDE FLEXIBLE MASONRY TIES ON ALL STEEL BEAMS AND COLUMNS THAT INTERFACE OR ABUT ANY MASONRY. USE 3/16"Ø TRIANGULAR TYPE TIES. SPACE AT 16" VERTICALLY AND HORIZONTALLY.

J. **LINTELS**
1. **MOVEMENT**: TO FACILITATE LINTEL MOVEMENT, THE BEARING OF AT LEAST ONE END OF EACH LINTEL SHOULD BE BUILT TO SLIDE. PLASTIC, BITUMINOUS SHEETS, NEOPRENE OR OTHER SUITABLE MATERIAL SHOULD BE USED FOR A SLIP PLATE.

2. **STEEL LINTELS:** DOUBLE LINTELS & SPACERS SHALL BE WELDED TO EACH OTHER AT 12" O.C. MAX.

J. **EXPANSION & ADHESIVE ANCHORS**
1. ANCHORING MATERIALS, INCLUDING NUTS & WASHERS, SHALL CONFORM TO THE SUPPLIER SPECIFICATIONS PERDRAWINGS. SUBSTITUTIONS MAY BE MADE PROVIDED THAT ALL MATERIAL PROPERTIES AND ALLOWABLE CAPACITIES ARE SHOWN TO BE EQUAL TO, OR IN EXCESS OF, THE SUPPLIER INDICATED ON DRAWINGS. SUBSTITUTIONS SHALL BE SUBMITTED TO STRUCTURAL ENGINEER FOR APPROVAL.

2. INSTALLATIONS PROCEDURES SHALL BE IN ACCORDANCE WITH SUPPLIER SPECIFICATIONS AND ALLOWABLE TOLERANCES. ALL EMBEDMENT DEPTHS SHALL BE "STANDARD" DEPTH PER SUPPLIER, U.N.O.

3. CONTRACTOR IS TO LOCATE EXISTING REBAR PRIOR TO ANCHOR INSTALLATION AND/OR FABRICATION OF ASSOCIATED PLATE. ANY CHANGE TO ANCHOR LAYOUT SHALL BE SUBMITTED TO STRUCTURAL ENGINEER FOR APPROVAL. CUTTING OF REBAR IS NOT PERMITTED.

DATE	ISSUED FOR	REV
2026.01.20	DESIGN DEVELOPMENT	A
2026.03.04	BIDDING	B

Design Team

Architecture: NORR
Structural: NORR
Mechanical: NORR
Electrical: NORR

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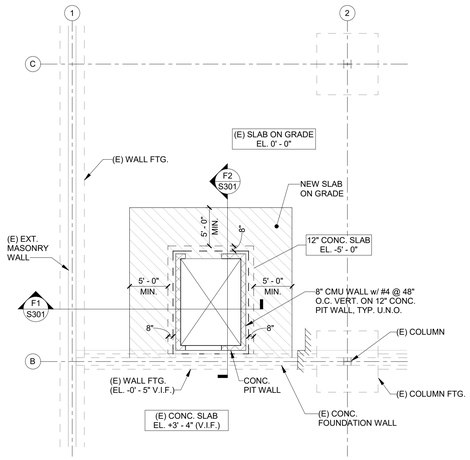
COUNTY OF DELAWARE DEPARTMENT OF PUBLIC WORKS

Project
VOTING MACHINE WAREHOUSE ELEVATOR ADDITION
403 EAST 24TH STREET, CHESTER, PA 19013

Drawing Title
GENERAL NOTES CONT'D

Project No. IN2325-0323-00

Drawing No. **S002**



1 FOUNDATION PARTIAL PLAN - ELEVATOR
1/8" = 1'-0"

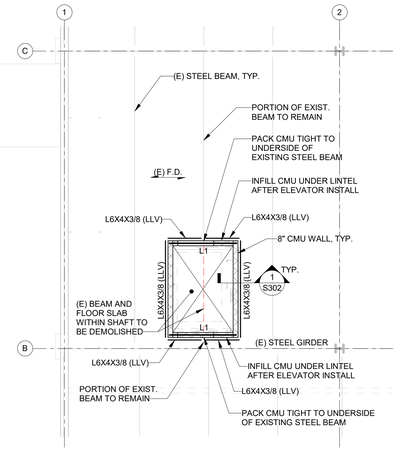
FOUNDATION SHEET NOTES

1. **ELEVATION**: TOP OF SLAB SHALL BE +0'-0" AS REFERENCED FROM DATUM OF **98.27' (V.I.F.)**. FOLLOWING ELEVATIONS ARE RELATIVE TO TOP OF SLAB ELEVATION = 0'-0":
   a. T.O. SLAB +/-x'-x" INDICATES TOP OF SLAB
   b. (+/-x'-x") INDICATES TOP OF FOOTING/MAT.
1. **SLAB ON GRADE** SHALL BE **5"** THICK REINFORCED WITH WELDED WIRE FABRIC **WWF 6x6-W2.9xW2.9** POURED OVER VAPOR BARRIER AND CLEAN COMPACTED STONE FILL.

FOUNDATION CRITERIA

GEOTECHNICAL ENGINEER	N/A
GEOTECH REPORT DATE	N/A
BEARING CAPACITY	2,000 PSF (ASSUMED)
FROST DEPTH	3' - 0"

4. **BEARING CAPACITY:** ALL BOTTOM OF FOOTING/MAT SLAB ELEVATION AND STRATUM SHALL BE INSPECTED AND APPROVED BY A REGISTERED GEOTECHNICAL ENGINEER HIRED BY THE OWNER IMMEDIATELY PRIOR TO PLACING CONCRETE.
5. COORDINATE ALL DIMENSIONS AND SECTIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS.



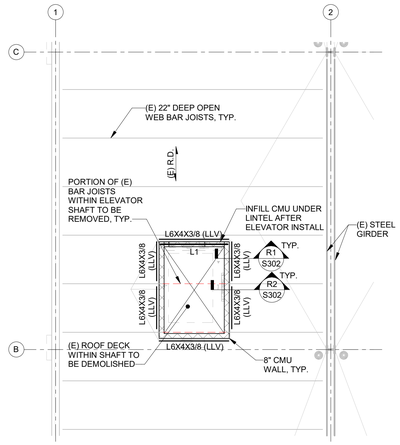
2 SECOND FLOOR FRAMING PARTIAL PLAN - ELEVATOR
1/8" = 1'-0"

2ND FLOOR SHEET NOTES

1. G.C. TO VERIFY IN FIELD EXISTING ELEVATIONS.
2. (F) F.D. DENOTES SPAN DIRECTION OF EXIST. WOOD T&G FLOOR DECK w/ 2" CONC. TOPPING.
3. "L1" INDICATES STANDARD PRECAST LINTEL TO MATCH WIDTH OF MASONRY WALL. PROVIDE 8" MIN BEARING EACH END. GROUT SOLID FOR MIN. OF (2) COURSES AT EACH BEARING POINT.
4. SHORE BEAMS PRIOR TO DEMOLITION (SHORING DESIGN BY CONTRACTOR).

ELEVATOR CONSTRUCTION SEQUENCE:

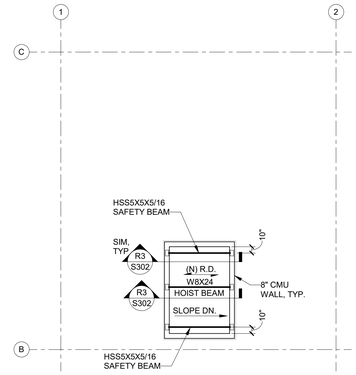
1.) SAWCUT AND DEMOLISH SLAB ON GRADE IN AREA OF NEW ELEVATOR, AS SHOWN ON PLAN.
2.) EXCAVATE FOR ELEVATOR PIT. DURING EXCAVATION ADJACENT TO THE EXISTING WALL FOOTING, FOLLOW UNDERPINNING DETAIL ON S200.
3.) CONSTRUCT NEW CONCRETE ELEVATOR MAT SLAB AND PIT WALLS.
4.) PUT SOIL BACK AROUND PIT WALLS AND COMPACT TO 95% COMPACTION IS 12" MAX. LIFTS.
5.) INSTALL NEW VAPOR BARRIER, CRUSHED STONE, AND SLAB ON GRADE AS SHOWN IN SECTIONS ON S301.
6.) CONSTRUCT 8" CMU WALLS TO THE UNDERSIDE OF THE EXISTING STEEL BEAM (PACK TIGHT WITH NON-SHRINK GROUT TO ENSURE FULL BEARING OF BEAM). TEMPORARILY SHORE FLOOR SLAB AROUND NEW ELEVATOR LOCATION.
7.) SAWCUT EXISTING FLOOR SLAB AND EXISTING BEAM.
8.) CONTINUE BUILDING CMU WALL THROUGH THE NEW FLOOR OPENING, AND INSTALL STEEL ANGLES ON CMU WALL AT UNDERSIDE OF SECOND FLOOR SLAB, AS SHOWN IN SECTION ON S302.
9.) TEMPORARILY SHORE THE ROOF DECK AND BAR JOISTS IN THE AREA OF THE NEW ELEVATOR.
10.) DEMOLISH THE PORTION OF THE BAR JOISTS IN THE AREA OF THE NEW ELEVATOR, AND CUT NEW OPENING IN ROOF DECK.
11.) CONTINUE BUILDING THE 8" CMU WALLS THROUGH THE OPENING IN THE ROOF DECK. INSTALL STEEL ANGLES TO CMU WALLS AND BAR JOIST SUPPORT, AS SHOWN IN SECTIONS ON S302.
12.) CONTINUE BUILDING THE 8" CMU WALLS TO THE TOP OF THE ELEVATOR POP-UP.
13.) INSTALL THE ELEVATOR POP UP ROOF.



3 ROOF FRAMING PARTIAL PLAN - ELEVATOR
1/8" = 1'-0"

ROOF SHEET NOTES

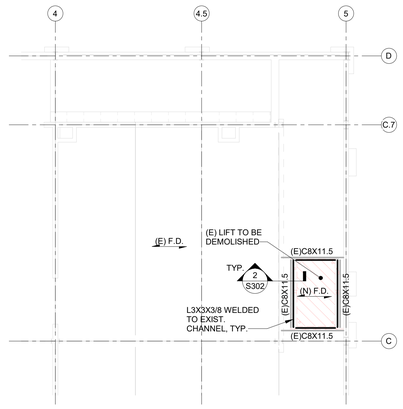
1. G.C. TO VERIFY IN FIELD EXISTING ELEVATIONS.
2. (E) R.D. DENOTES SPAN DIRECTION OF EXIST. METAL ROOF DECK.
3. "L1" INDICATES STANDARD PRECAST LINTEL TO MATCH WIDTH OF MASONRY WALL. PROVIDE 8" MIN BEARING EACH END. GROUT SOLID FOR MIN. OF (2) COURSES AT EACH BEARING POINT.
4. SHORE BEAMS PRIOR TO DEMOLITION (SHORING DESIGN BY CONTRACTOR).



4 ROOF POP-UP PARTIAL PLAN - ELEVATOR
1/8" = 1'-0"

ROOF SHEET NOTES

1. (N) R.D. DENOTES SPAN DIRECTION OF NEW 3", 20 GA. GALV. TYPE 'N' METAL ROOF DECK.



5 SECOND FLOOR FRAMING PARTIAL PLAN - LIFT INFILL
1/8" = 1'-0"

2ND FLOOR SHEET NOTES

1. G.C. TO VERIFY IN FIELD EXISTING ELEVATIONS.
2. (E) F.D. DENOTES SPAN DIRECTION OF EXIST. WOOD T&G FLOOR DECK w/ 2" CONC. TOPPING.
3. (N) F.D. DENOTES SPAN DIRECTION OF NEW 3", 20 GA. GALV. COMPOSITE FLOOR DECK TOPPED WITH 2-1/2" LIGHTWEIGHT CONCRETE w/ 6X6 - W2.0XW2.0 W.W.F. (5 1/2" TOTAL THICKNESS)

DATE	ISSUED FOR	REV
2026.01.20	DESIGN DEVELOPMENT	A
2026.03.04	BIDDING	B

Design Team

Architecture: NORR
Structural: NORR
Mechanical: NORR
Electrical: NORR

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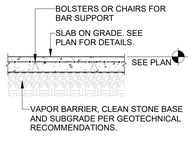
Client
COUNTY OF DELAWARE DEPARTMENT OF PUBLIC WORKS

Project
VOTING MACHINE WAREHOUSE ELEVATOR ADDITION
403 EAST 24TH STREET, CHESTER, PA 19013

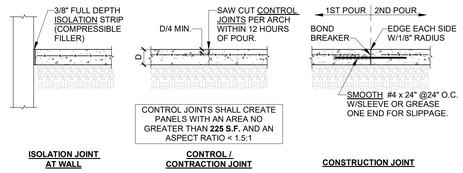
Drawing Title
STRUCTURAL PLANS

Project No.
IN2325-0323-00

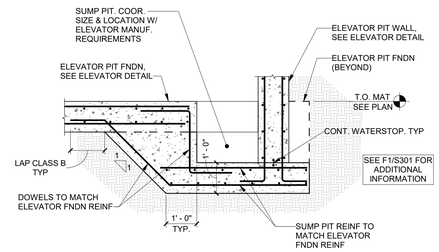
Drawing No.
S100



A SLAB ON GRADE CONSTRUCTION
N.T.S.



B TYPICAL SLAB ON GRADE JOINTS
N.T.S.



C TYPICAL ELEVATOR SUMP PIT CONSTRUCTION
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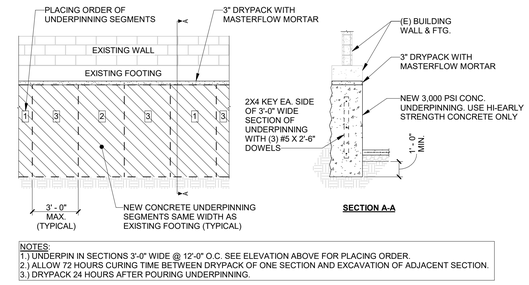
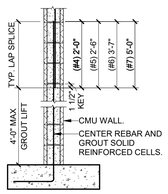
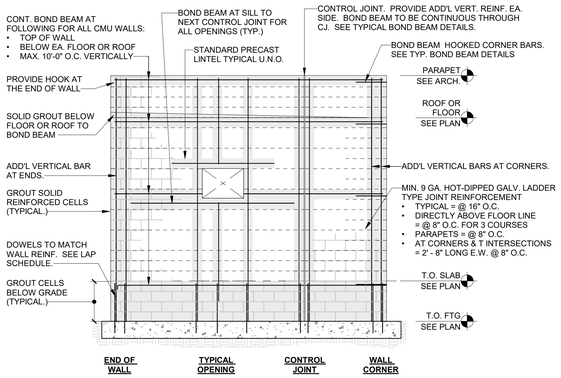


NOTES:
1.) UNDERPIN IN SECTIONS 3'-0" WIDE @ 12'-0" O.C. SEE ELEVATION ABOVE FOR PLACING ORDER.
2.) ALLOW 72 HOURS CURING TIME BETWEEN DRYPACK OF ONE SECTION AND EXCAVATION OF ADJACENT SECTION.
3.) DRYPACK 24 HOURS AFTER POURING UNDERPINNING.

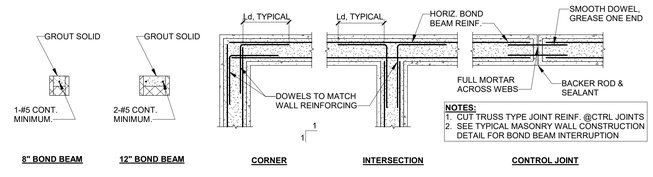
D TYPICAL UNDERPINNING DETAIL
N.T.S.



E MASONRY LAP SPLICE
N.T.S.



F PRESCRIPTIVE INTERMEDIATE REINFORCED MASONRY WALL
N.T.S.



G TYPICAL BOND BEAM DETAIL
N.T.S.

DATE	ISSUED FOR	REV
2026.01.20	DESIGN DEVELOPMENT	A
2026.03.04	BIDDING	B

Design Team

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Project Manager	Drawn
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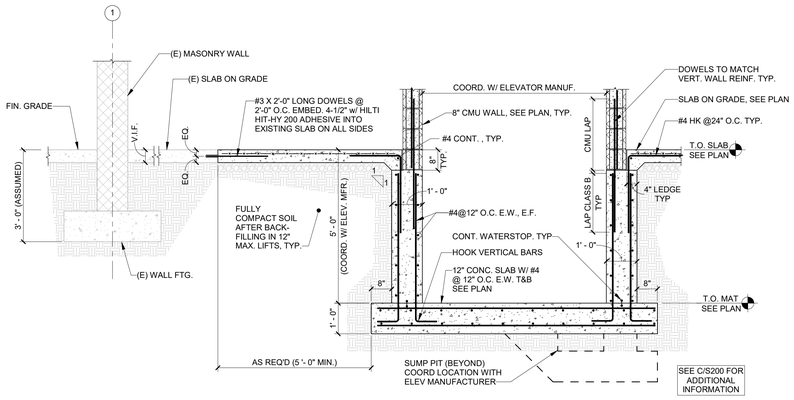
Project
VOTING MACHINE WAREHOUSE ELEVATOR ADDITION
403 EAST 24TH STREET, CHESTER, PA 19013

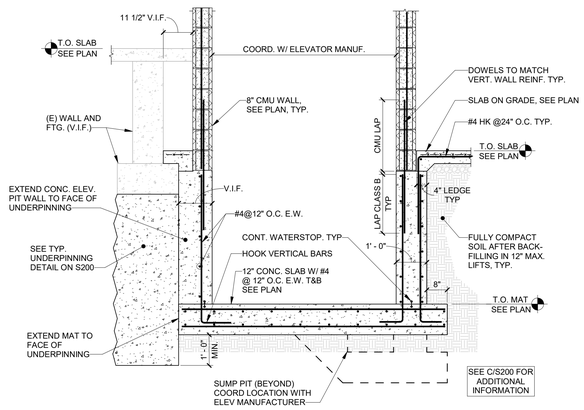
Drawing Title
TYPICAL DETAILS

Project No.
IN2325-0323-00

Drawing No.
S200



F1 SECTION THROUGH ELEVATOR PIT & EXT. WALL
1/2" = 1'-0"



F2 SECTION THROUGH ELEVATOR PIT & ELEVATED WALKWAY
1/2" = 1'-0"

DATE	ISSUED FOR	REV
2026.01.20	DESIGN DEVELOPMENT	A
2026.03.04	BIDDING	B

Design Team

Architecture: NORR
Structural: NORR
Mechanical: NORR
Electrical: NORR

Seal

NORR
One Penn Center
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Project Manager	Drawn
	CES
Project Architect	Checked
	SCD

Client
COUNTY OF DELAWARE DEPARTMENT OF PUBLIC WORKS

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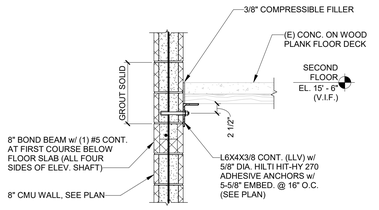
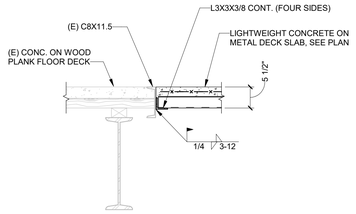
Drawing Title
FOUNDATION SECTIONS

Project No.
IN2325-0323-00

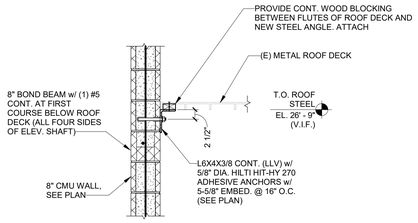
Drawing No.
S301



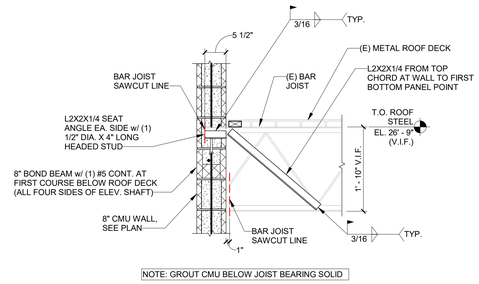
1 FLOOR SUPPORT AT CMU
3/4" = 1'-0"



2 SECTION AT FLOOR INFILL
3/4" = 1'-0"

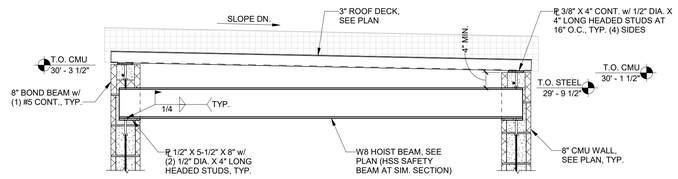


R1 ROOF SUPPORT AT CMU
3/4" = 1'-0"



NOTE: GROUT CMU BELOW JOIST BEARING SOLID

R2 SUPPORT OF EXIST. BAR JOIST AT NEW CMU WALL
3/4" = 1'-0"



NOTES:
1.) GROUT SOLID A MIN. OF TWO COURSES BELOW ALL BEAM BEARING LOCATIONS.
2.) GROUT BEAM POCKET SOLID.

R3 SECTION AT ELEVATOR POP-UP
3/4" = 1'-0"

DATE	ISSUED FOR	REV
2026.03.04	BIDDING	B

This drawing has been prepared solely for the use of COUNTY OF DELAWARE DEPARTMENT OF PUBLIC WORKS and there are no representations of any kind made by

This drawing shall not be used for construction purposes until the seal appearing hereon is signed and dated by the Architect or Engineer

Design Team

Architecture: NORR
Structural: NORR
Mechanical: NORR
Electrical: NORR

Seal

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Drawing Title
FRAMING SECTIONS

Project No.
IN2325-0323-00

Drawing No.
S302