

GR GENERAL REQUIREMENTS

GR-1 AS USED IN THESE GENERAL NOTES: "DRAWINGS" MEANS THE LATEST STRUCTURAL DESIGN DRAWINGS, UON. "SPECIFICATIONS" MEANS THE LATEST PROJECT SPECIFICATIONS, UON. "CONTRACT DOCUMENTS" IS DEFINED AS THE DESIGN DRAWINGS AND THE SPECIFICATIONS "SER" IS DEFINED AS THE STRUCTURAL ENGINEER OF RECORD FOR THE STRUCTURE IN ITS FINAL CONDITION.

GR-2 THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF THE STRUCTURAL WORK WITH THE ARCHITECTURAL, CIVIL, MEP CONTRACT DOCUMENTS, AS WELL AS ANY OTHER APPLICABLE TRADES.

GR-3 THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE UNTIL THE CONSTRUCTION OF THE STRUCTURE REACHES ITS FINAL CONDITION.

GR-4 THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, INSTALLATION, AND REMOVAL OF TEMPORARY BRACING AND CONSTRUCTION SUPPORTS, FOR NEW AND EXISTING STRUCTURES, AS NECESSARY TO COMPLETE THE PROJECT. NO PORTION OF THE PROJECT WHILE UNDER CONSTRUCTION IS INTENDED TO BE STABLE IN THE ABSENCE OF THE CONTRACTOR'S TEMPORARY SUPPORTS AND BRACES.

GR-5 LATERAL LOAD RESISTANCE AND STABILITY OF THE STRUCTURE IN ITS FINAL CONDITION IS PROVIDED BY BRACED FRAMES AND SHEARWALLS (OF TORNADO SHELTER) FOR THE LAB AND OFFICE AREAS, MOMENT FRAMES FOR THE OFFICE WING, CONFERENCE AREA, AND LINK. LATERAL STABILITY OF OTHER ELEMENTS IS PROVIDED THROUGH FLOOR SLABS AND ROOF DECK.

GR-6 THE SPECIFICATIONS ARE AN INTEGRAL PART OF THE CONTRACT DOCUMENTS AND SHALL BE USED IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS.

GR-7 THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS AND COORDINATE WITH THE STRUCTURAL DRAWINGS, ARCHITECTURAL DRAWINGS, DRAWINGS FROM OTHER CONSULTANTS, PROJECT SHOP DRAWINGS AND FIELD CONDITIONS.

GR-8 IN CASES OF CONFLICT BETWEEN DRAWINGS AND/OR SPECIFICATIONS AND OTHER DISCIPLINES OR EXISTING CONDITIONS, CONTRACTOR SHALL NOTIFY THE DESIGN PROFESSIONALS AND OBTAIN CLARIFICATION PRIOR TO BIDDING AND PROCEEDING WITH WORK. WHERE CONFLICTS EXIST IN CONTRACT DOCUMENTS, CONTRACTOR TO INCLUDE THE GREATER QUANTITY OR HIGHER QUALITY IN ITS BID (AS DIRECTED BY ARGONNE).

GR-9 APPLY DETAILS, SECTIONS, AND NOTES ON THE DRAWINGS WHERE CONDITIONS ARE SIMILAR TO THOSE INDICATED BY DETAIL, DETAIL TITLE OR NOTE.

GR-10 ONLY USE DIMENSIONS INDICATED ON THE DRAWINGS. DO NOT SCALE DRAWINGS.

GR-11 ASSUME EQUAL SPACING BETWEEN ESTABLISHED DIMENSIONS, IF NOT INDICATED ON DRAWINGS.

GR-12 CENTERLINES OF COLUMNS AND FOUNDATIONS COINCIDE WITH GRID LINE INTERSECTIONS, UON.

GR-13 CENTERLINES OF GRADE BEAMS AND WALLS COINCIDE WITH CENTERLINES OF FOUNDATIONS, UON.

GR-14 CENTERLINES OF FRAMING MEMBERS COINCIDE WITH COLUMN CENTERLINES, UON.

GR-15 THE CONTRACTOR SHALL PROTECT EXISTING FACILITIES, STRUCTURES AND UTILITIES FROM DAMAGE.

GR-16 THE CONTRACTOR SHALL VERIFY THAT CONSTRUCTION LOADS DO NOT EXCEED THE CAPACITY OF THE STRUCTURE AT THE TIME THE LOAD IS APPLIED.

GR-17 THE CONTRACTOR SHALL COORDINATE THE BOTTOM OF BASE PLATE ELEVATIONS WITH THE AS-BUILT TOP OF SUPPORT ELEVATIONS.

GR-18 THE CONTRACTOR SHALL VERIFY ALL OPENING SIZES AND LOCATIONS WITH OTHER DISCIPLINES. THE DRAWINGS DO NOT SHOW ALL OPENINGS REQUIRED. ADDITIONAL OPENINGS, BLOCKOUTS AND SLEEVES MAY BE REQUIRED BY OTHER DISCIPLINES AND SHALL BE CONSTRUCTED USING THE TYPICAL DETAILS AND/OR THE CRITERIA INDICATED ON THE DRAWINGS. OPENINGS REQUIRED BUT NOT SHOWN ON THE STRUCTURAL DRAWINGS MUST BE APPROVED BY THE STRUCTURAL ENGINEER.

GR-19 ELEVATIONS INDICATED ON STRUCTURAL DRAWINGS ARE BASED ON A PROJECT DATUM OF 0'-0" = 744.36FFE.

GR-20 SEE ARCHITECTURAL, CIVIL, MEP, AND VERTICAL TRANSPORTATION, CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION RELATING TO THE COORDINATION OF STRUCTURAL COMPONENTS INCLUDING, BUT NOT LIMITED TO:

CIVIL: SITING OF BUILDING GRID LINES WITH RESPECT TO ARGONNE BENCHMARKS SITE PREPARATION BACKFILLING MATERIALS AND REQUIREMENTS PAVING AND SITE ELEMENTS OUTSIDE OF BUILDING ENVELOPE NEW AND EXISTING SITE UTILITIES

ARCHITECTURAL: PLAN DIMENSIONS AND PROJECT DATUM SLAB EDGE DIMENSIONS FINISH ELEVATIONS WATERPROOFING AND DAMP-PROOFING DETAILS RAMP GEOMETRY, PITS, SLAB SLOPES AND DEPRESSIONS EMBEDMENTS, INSERTS, BLOCKOUTS, ETC. EXACT OPENING SIZES FOR PIPES, DUCTS, ETC. CONCRETE FINISHES AND TOPPING SLABS CONCRETE CURBS AND HOUSEKEEPING PADS INTERIOR NON-STRUCTURAL MASONRY PARTITIONS FIRE RATINGS METAL PAN STAIRS AND SUPPORTS OPERABLE PARTITIONS

MEP: PIPE AND DUCT SIZES FOR OPENING AND SLEEVE COORDINATION FLOOR DRAINS UNDERFLOOR AND PERIMETER DRAINAGE SYSTEMS EQUIPMENT CURBS CONDUITS AND EMBEDMENTS IN WALLS AND SLABS

VERTICAL TRANSPORTATION: INSERTS, HANGERS, TRENCHES, PITS, CONDUITS IN WALLS AND SLABS EQUIPMENT SUPPORT, ELEVATOR DIVIDER BEAMS, EMBEDMENTS, AND ANCHOR BOLTS

GR-21 ARGONNE HAS ADVISED THAT THE BUILDING WILL BE CONDITIONED YEAR ROUND (24 HOURS PER DAY, 365 DAYS PER YEAR). THE MECHANICAL ENGINEER HAS ADVISED THE MAXIMUM ANTICIPATED TEMPERATURE DIFFERENTIAL INSIDE THE BUILDING IN THE PERMANENT CONDITION TO BE 30 DEGREES FAHRENHEIT. BASED ON THIS INFORMATION, AN EXPANSION JOINT TO RELIEVE THERMAL EXPANSION OR CONTRACTION OF THE STRUCTURAL FRAME IS NOT REQUIRED WITHIN THE BUILDING.

GR-22 A TEMPORARY EXPANSION JOINT MAY BE REQUIRED IN THE STEEL FRAMING. THE DETERMINATION REQUIRES KNOWLEDGE OF THE STEEL ERECTION SEQUENCING, SCHEDULING AND INSTALLATION OF THE EXTERIOR CLADDING. UPON RECEIPT OF THE INFORMATION, SER TO REVIEW REQUIREMENTS AND MAKE RECOMMENDATIONS FOR JOINT LOCATION AND CONCEPTUAL DETAILS, AS REQUIRED.

GR-23 CONTRACTOR TO CONSIDER DECK SLAB DEFLECTION WHEN COORDINATING AVAILABLE CEILING SPACE FOR MEP WORK.

CD CODES AND DESIGN CRITERIA

CD-1 PERFORM ALL CONSTRUCTION IN CONFORMANCE WITH THE BUILDING AND DESIGN CODES REFERENCED WITHIN THESE DOCUMENTS. THE PROJECT DOCUMENTS REFER TO THE FOLLOWING CODES AND STANDARDS, UON:

INTERNATIONAL BUILDING CODE (IBC) 2009 STRUCTURAL CONCRETE: "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" THE AMERICAN CONCRETE INSTITUTE (ACI 318-2008)

CONCRETE MASONRY: "BUILDING CODE REQUIREMENTS FOR CONCRETE MASONRY STRUCTURES" THE AMERICAN CONCRETE INSTITUTE (ACI 530-08, 2008)

STRUCTURAL STEEL: "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" MARCH 9, 2005 THIRTEENTH EDITION CONFORMING TO THE PROVISIONS OF LOAD RESISTANCE FACTOR DESIGN, BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC-LFRD)

SAFE ROOM: "DESIGN AND CONSTRUCTION GUIDANCE FOR COMMUNITY SAFE ROOMS," FEMA 361, SECOND EDITION (AUGUST 2008)

CD-2 SEE DESIGN LOAD DIAGRAMS ON SHEET S0.0.3 FOR LOCATIONS AND EXTENT OF LIVE LOAD.

CD-3 SUPERIMPOSED DEAD LOADS: SEE DESIGN LOAD DIAGRAMS ON SHEET S0.0.3 FOR LOCATIONS AND EXTENT OF SUPERIMPOSED DEAD LOADS.

CD-4 SNOW LOADS: FLAT ROOF SNOW LOAD (P_f) 21 PSF GROUND SNOW LOAD (P_g) 30 PSF SNOW EXPOSURE FACTOR (C_e) 1.0 SNOW LOAD IMPORTANCE FACTOR (I_s) 1.0 THERMAL FACTOR (C_t) 1.0 SNOW DRIFTING PER CODE SEE LOADING DIAGRAMS

CD-5 WIND LOAD DESIGN DATA: MAIN WIND FORCE RESISTING SYSTEM BASIC WIND SPEED, V 90 MPH B 1.0 EXPOSURE II BUILDING CATEGORY II INTERNAL PRESSURE COEFFICIENT ±0.18

COMPONENTS AND CLADDING: USE CONTROLLING SEISMIC OR WIND DESIGN LOADS 1) SEISMIC: PER IBC 2) WIND LOADS:

WALLS: 10ft² 500 ft² ZONE 4 +14.9 +11.1 ZONE 5 -16.1 -12.4

PARAPETS: 10ft² 100 ft² ZONE 2 +35.3 +22.7 ZONE 3 +47.9 +22.7

CANOPIES: 10ft² 100 ft² ZONE 1, 2 -24.7 -22.5 ZONE 3 -37.6 -12.4

ZONES 2, 3 AND 5 DEFINED BY a = 12ft REFER TO IBC 2009 FOR ZONE LOCATIONS.

SAFE ROOM DESIGN DATA (PER FEMA 361): MAIN WIND FORCE RESISTING SYSTEM BASIC WIND SPEED, V 250 MPH C EXPOSURE II BUILDING CATEGORY II INTERNAL PRESSURE COEFFICIENT ±0.55

CD-6 SEISMIC LOAD DESIGN DATA: SEISMIC IMPORTANCE FACTOR (I_s) 1.0 OCCUPANCY CATEGORY II SITE CLASS C S₁ 0.188 S₂ 0.064 S₃ 0.150 S₃ 0.073 SEISMIC DESIGN CATEGORY B SEISMIC FORCE RESISTING SYSTEMS:

1) ORDINARY REINFORCED CONCRETE SHEAR WALLS & ORDINARY CONCRETE BRACED FRAMES R=3.0 2) ORDINARY STEEL MOMENT FRAMES R=3.0 SEISMIC RESPONSE COEFFICIENT (C_s) 0.05 ANALYSIS PROCEDURE DESCRIPTION EQUIVALENT LATERAL FORCE

CD-7 IN CASES WHERE THE CONTRACTOR DETERMINES THAT SUSPENDED OR FLOOR MOUNTED MEP EQUIPMENT LOADS EXIST THAT EXCEED DESIGN LOADS INDICATED ON S0.0.3 DIAGRAM, CONTRACTOR SHALL SUBMIT LOAD DATA TO DESIGN PROFESSIONALS FOR REVIEW PRIOR TO PROCEEDING WITH WORK.

CD-8 DISTRIBUTE THE MAXIMUM LOAD SUSPENDED FROM ANY STRUCTURAL MEMBER FOR MEP DUCTWORK, PIPING ETC OVER THE MEMBER'S TRIBUTARY AREA IN A WAY THAT THE DESIGN SUPERIMPOSED DEAD LOADS LISTED IN CONTRACT DOCUMENTS ARE NOT EXCEEDED. THE CONTRACTOR SHALL COORDINATE THE LOADS OF ALL TRADES AND PROVIDE ADDITIONAL SUPPORT OR DISTRIBUTION FRAMING AS REQUIRED TO ACHIEVE THE ALLOWABLE LOAD DISTRIBUTION.

CD-9 ELEVATOR GUIDERAIL SUPPORTS, MACHINE ROOMS, PITS, AND PENTHOUSES ARE BASED ON ELEVATOR TYPES INDICATED ON ARCHITECTURAL CONTRACT DOCUMENTS. CONTRACTOR SHALL SUBMIT FOR REVIEW ANY PLANNED CHANGE TO ELEVATORS TO DESIGN PROFESSIONALS PRIOR TO SUBMITTING CORRESPONDING STRUCTURAL SHOP DRAWINGS FOR ACTION.

CD-10 STRUCTURAL COMPONENTS ARE NOT DESIGNED FOR VIBRATING EQUIPMENT. MOUNT VIBRATING EQUIPMENT ON VIBRATION ISOLATORS.

CD-11 SERVICEABILITY: LIVE LOAD DEFLECTION IS LESS THAN L/360 LONG-TERM TOTAL DEFLECTION IS LESS THAN L/240 EXTERIOR SPANDRELS HAVE BEEN DESIGNED TO LIMIT LIVE LOAD MIDSPAN VERTICAL DEFLECTION TO 1/360 OF THE SPAN OR 1/2", WHICHEVER IS LESS.

LATERAL DRIFT DUE TO WIND IS LESS THAN OR EQUAL TO H/400. LATERAL DRIFT DUE TO SEISMIC LOADS IS LESS THAN 0.020H. LATERAL DRIFT AT SAFE ROOM PER FEMA 361 LOADING IS LESS THAN H/400.

VIBRATION CRITERIA: A VIBRATION CRITERION FOR SENSITIVE EQUIPMENT, IN ACCORDANCE WITH THE RATING SYSTEM PUBLISHED BY INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY (IEST), HAS BEEN ASSIGNED TO THE LABORATORY SPACES OF THE BUILDING BY THE LABORATORY PLANNER. VIBRATION CLASS A WITH A LIMIT OF 2000 MICRO-IN/SEC AND MODERATE FOOTFALL AT THE MIDDLE OF A BAY IS THIS DESIGN PERFORMANCE CRITERION. ALL LABORATORIES ARE LOCATED ON 6" (MIN) SLAB-ON-GRADE FLOORS, AND PERFORMANCE HAS BEEN EVALUATED BY THE VIBRATION CONSULTANT.

CD-12 CONNECTIONS OF SYSTEMS DESIGNED BY CONTRACTOR'S ENGINEER SUCH AS, BUT NOT LIMITED TO, CLADDING, STAIRS, ELEVATORS, AND MEP LOADS ARE ASSUMED TO IMPOSE VERTICAL AND/OR HORIZONTAL LOADS ON THE BASE BUILDING STRUCTURAL MEMBERS WITHOUT GENERATING TORSION IN THE SUPPORTING STRUCTURAL MEMBERS. CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING ALL SUPPLEMENTARY BRACING MEMBERS AS REQUIRED TO PREVENT TORSION ON THE BASE BUILDING STRUCTURE.

CD-13 FOR FIRE RATING AND FIREPROOFING ASSEMBLY EVALUATIONS, CONSIDER THE FOLLOWING ASSEMBLIES RESTRAINED: COMPOSITE WIDE-FLANGE STEEL FRAMING, INTERIOR BAYS OF CONTINUOUS CAST-IN-PLACE CONCRETE CONSTRUCTION. CONSIDER ALL OTHER ASSEMBLIES UNRESTRAINED.

CD-14 DESIGN OF THE STRUCTURE AT THE INTERFACE TO THE EXISTING LOM IS BASED ON INFORMATION INCLUDED IN THE FOLLOWING STRUCTURAL DRAWINGS FOR THE EXISTING LOM: "ADVANCED PHOTON SOURCE CONVENTIONAL FACILITIES" PREPARED BY KNIGHT ARCHITECTS ENGINEERS PLANNERS, INC. DATED MAY 18, 1992

DE DEMOLITION: THE CONTRACTOR IS FULLY RESPONSIBLE FOR THE MEANS AND METHODS OF DEMOLITION AND THE INTEGRITY AND STABILITY OF THE EXISTING STRUCTURE DURING DEMOLITION UNTIL THE WORK IS COMPLETED. THE CONTRACTOR SHALL PROVIDE SHORING IN REQUIRED LOCATIONS WHERE EXISTING CONSTRUCTION TO REMAIN WILL BE AFFECTED BY DEMOLITION.

DE-2 THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS TO ANY STRUCTURAL ELEMENTS WHICH ARE TO REMAIN AND THAT HAVE BEEN DAMAGED DURING THE DEMOLITION PROCESS TO THE COMPLETE SATISFACTION OF ARGONNE. THE REPAIRS SHALL BE AT NO EXPENSE TO ARGONNE. ALL REPAIR WORK SHALL BE DESIGNED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE OF ILLINOIS AND SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO COMMENCING REPAIR WORK.

DE-3 ALL EXISTING FRAMING IS INDICATED FOR REFERENCE ONLY AND IS TO BE FIELD VERIFIED BY THE CONTRACTOR. VERIFY THE EXACT EXTENT OF DEMOLITION AT THE SITE. DETERMINE THE NATURE AND EXTENT OF DEMOLITION THAT WILL BE NECESSARY BY COMPARING THE CONTRACT DOCUMENTS WITH THE EXISTING CONSTRUCTION.

DE-4 THE CONTRACTOR SHALL USE THE STRUCTURAL CONTRACT DOCUMENTS IN CONJUNCTION WITH THE ARCHITECTURAL AND MEP DEMOLITION CONTRACT DOCUMENTS. IN THE EVENT OF CONFLICTS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER.

DE-5 THE CONTRACTOR SHALL USE QUALIFIED, EXPERIENCED PERSONNEL FOR DEMOLITION AND REMOVAL OPERATIONS. PERFORM DEMOLITION AND REMOVAL OPERATIONS IN A CAREFUL AND ORDERLY MANNER TO PREVENT HAZARDS TO PERSONS, DAMAGE TO PROPERTY, AND THE SPREADING OF DUST AND DEBRIS.

DE-6 DO NOT PERMIT PORTIONS OF THE STRUCTURE TO FALL NOR DEBRIS TO DROP EXCEPT BY METHODS WHICH WILL ENSURE INTEGRITY OF THE STRUCTURE.

DE-7 PRIOR TO THE START OF WORK, VERIFY THAT THE SCOPE OF DEMOLITION INDICATED ON THE CONTRACT DOCUMENTS SHALL NOT DAMAGE, CUT OR DISRUPT SERVICE OF ANY MECHANICAL SYSTEM, ELECTRICAL SYSTEM OR UTILITY EMBEDDED IN THE EXISTING STRUCTURE.

DE-8 DO NOT REMOVE MORE OF THE EXISTING STRUCTURE THAN INDICATED ON CONTRACT DOCUMENTS. DO NOT DAMAGE, MAR, CUT OR DEFACE THE REMAINING STRUCTURE OR MATERIALS TO BE REUSED.

DE-9 THE CONTRACTOR SHALL INCLUDE IN HIS BID THE COST OF REMOVING DEMOLISHED MATERIALS FROM THE SITE IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES AND, AND REGULATIONS.

DE-10 WHERE NEW OPENINGS IN EXISTING CONCRETE SLABS ARE TO BE CREATED, THE DEMOLITION CONTRACTOR SHALL CORE HOLES AT THE OUTSIDE CORNERS OF THE NEW OPENING PRIOR TO DEMOLITION. SAW-CUT AND DEMOLISH SLAB ONLY AFTER THE INSTALLATION OF ALL REQUIRED NEW STRUCTURAL FRAMING AND/OR REINFORCEMENT IN PLAN OR SECTION, UON. SAW CUTTING SHALL BE STRAIGHT AND SHALL NOT EXTEND INTO EXISTING SLAB TO REMAIN NOR BEYOND THE HOLES CORED AT THE CORNERS OF THE NEW OPENING.

PI PERFORMANCE ITEMS

PI-1 THE CONTRACTOR SHALL EMPLOY OR RETAIN A LICENSED STRUCTURAL ENGINEER IN THE STATE IN WHICH THIS PROJECT IS LOCATED TO DESIGN AND DETAIL PERFORMANCE ITEMS AS PART OF THE BASE BUILDING STRUCTURE INDICATED IN THE CONTRACT DOCUMENTS INCLUDING BUT NOT LIMITED TO:

STRUCTURAL STEEL CONNECTIONS STEEL COMPOSITE DECK STEEL ROOF DECK

SU SUBMITTALS

SU-1 TWENTY WORKING DAYS PRIOR TO SUBMITTING SHOP DRAWINGS, THE CONTRACTOR SHALL SUBMIT FOR STRUCTURAL ENGINEER'S REVIEW A SCHEDULE WHICH DETAILS THE ESTIMATED QUANTITY OF SHOP DRAWINGS AND THE DATE THE SHOP DRAWINGS WILL BE RECEIVED BY THE STRUCTURAL ENGINEER. THE STRUCTURAL ENGINEER SHALL HAVE THE OPPORTUNITY TO REVIEW THE PROPOSED SCHEDULE AND SUBMIT COMMENTS TO THE CONTRACTOR. THE FINAL SHOP DRAWING SCHEDULE SHALL BE DEVELOPED AND SUBMITTED TO THE STRUCTURAL ENGINEER. IN ACCORDANCE WITH THE SHOP DRAWING SCHEDULE, THE STRUCTURAL ENGINEER WILL RETURN THE SHOP DRAWING ITEMS WITHIN TEN WORKING DAYS AFTER HAVING RECEIVED THE REPRODUCIBLE OR ELECTRONIC SHOP DRAWING.

SU-2 THE CONTRACTOR IS TO REVIEW EACH SUBMITTAL PRIOR TO FORWARDING TO ARCHITECT AND STRUCTURAL ENGINEER. THE CONTRACTOR IS TO STAMP EACH SUBMITTAL VERIFYING THAT THE FOLLOWING IS ADRESSED:

- 1. THE SHOP DRAWING IS REQUESTED.
2. THE SHOP DRAWING IS BASED ON THE LATEST DESIGN.
3. THE ARCHITECT'S AND STRUCTURAL ENGINEER'S COMMENTS FROM ANY PREVIOUS SUBMITTALS ARE ADDRESSED.
4. THE WORK IS COORDINATED AMONG ALL CONSTRUCTION TRADES.
5. REVISIONS FROM PREVIOUS SUBMITTALS ARE CLEARLY MARKED BY CIRCLING OR CLOUDS.
6. SUBMITTAL IS COMPLETE.
7. SUBMITTAL DOES NOT INCLUDE SUBSTITUTION REQUEST
8. SUBMITTAL SHALL INCLUDE A STAMP INDICATING PROJECT NAME AND LOCATION, SUBMITTAL NUMBER, SPECIFICATION SECTION NUMBER.

SU-3 THE STRUCTURAL ENGINEER SHALL RETURN, WITHOUT COMMENT, SUBMITTALS WHICH THE CONTRACTOR HAS NOT STAMPED OR WHICH DO NOT MEET THE ABOVE REQUIREMENTS. THE STRUCTURAL ENGINEER'S REVIEW OF SUBMITTALS SHALL BE FOR GENERAL CONFORMANCE WITH THE DESIGN INTENT. NO WORK SHALL BE STARTED WITHOUT SUCH REVIEW.

SU-4 THE FOLLOWING ITEMS REQUIRE SUBMITTALS FOR STRUCTURAL REVIEW AS OUTLINED IN THE SPECIFICATIONS:

Table with columns: Item No., Description, Material, and Notes. Includes items for concrete formwork, concrete reinforcing layout, concrete mix designs, concrete construction joint layout, masonry reinforcing layout, structural steel, shear stud layout, steel composite deck, and steel roof deck.

S=SHOP DRAWINGS REQUIRED CALC = SUPPORTING CALCULATIONS REQUIRED, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE IN WHICH THE PROJECT IS LOCATED.

SU-5 THE ITEMS IN THIS SECTION REQUIRE SHOP DRAWINGS, SUBMITTED FOR REVIEW OF INTERACTION WITH THE BASE BUILDING STRUCTURE.

THE FOLLOWING SHOP DRAWINGS SHALL SHOW THE MAGNITUDES, DIRECTIONS, LOCATIONS AND CONNECTION CONDITIONS OF ALL LOADS IMPOSED ON THE SUPPORTING STRUCTURE. SUBMIT ALL INFORMATION ON STRUCTURAL DRAWINGS:

ARCHITECTURAL ORNAMENTATION (FLAGPOLES, BANNERS, MASTS, ETC.) ELEVATOR REACTIONS SKYLIGHTS WINDOW WASHING DAVIT AND TIEBACK SYSTEMS ROOFTOP EXHAUST STACKS

IN ADDITION TO THE SHOP DRAWING REQUIREMENTS ABOVE, THE FOLLOWING SUBMITTALS SHALL ALSO LIST THE DESIGN LOADS USED AND BE SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE IN WHICH THE PROJECT IS LOCATED:

COLD-FORMED METAL FRAMING EXTERIOR CLADDING SYSTEMS METAL STAIRS

FO FOUNDATIONS

FO-1 THE FOUNDATION DESIGN IS BASED ON THE FOLLOWING DOCUMENTS: "SUBSURFACE EXPLORATION AND GEOTECHNICAL REPORT FOR THE PROPOSED ARGONNE NATIONAL LABORATORY (ANL) ADVANCED PROTEIN CRYSTALLIZATION FACILITY (APCF), DUPAGE COUNTY, ILLINOIS - AECOM PROJECT NO. 80215145" DATED MAY 18, 2011

"ADDENDUM TO AECOM REPORT DATED MAY 18, 2011, ARGONNE APCF, DUPAGE COUNTY, IL - AECOM PROJECT NO. 80215145" DATED JUNE7, 2011

FO-2 FOUNDATIONS HAVE BEEN DESIGNED BASED ON THE FOLLOWING DESIGN VALUES FROM THE GEOTECHNICAL INVESTIGATION REPORT:

NET ALLOWABLE BEARING CAPACITY: 4,000 PSF PASSIVE PRESSURE COEFFICIENT (K_p): 3.0 ACTIVE PRESSURE COEFFICIENT (K_a): 0.4 COEFFICIENT OF FRICTION: 0.35

SEE GEOTECHNICAL REPORT FOR ADDITIONAL REQUIREMENTS AND INFORMATION. DESIGN VALUES SHALL BE FIELD VERIFIED BY QUALIFIED GEOTECHNICAL CONSULTANT RETAINED BY ARGONNE.

FO-3 THE CONTRACTOR SHALL VERIFY FOUNDATION INSTALLATION AND CONSTRUCTION IS IN CONFORMANCE WITH THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT.

FO-4 CONTRACTOR SHALL BE RESPONSIBLE TO ADEQUATELY PROTECT ALL EXCAVATION, WHERE NECESSARY, SHEET AND SHORE THE EXCAVATION WITH ALL REQUIRED TIEBACKS AND BRACING AS DETERMINED BY CONTRACTOR'S STRUCTURAL ENGINEER.

FO-5 DO NOT BACKFILL AGAINST CANTILEVER RETAINING WALLS UNTIL THE CONCRETE HAS ATTAINED 100% OF ITS DESIGN STRENGTH.

CM CONCRETE MATERIALS

CM-1 CONCRETE STRENGTH SHALL MEET THE FOLLOWING 28-DAY COMPRESSIVE STRENGTHS (f'c) UON:

Table with columns: Material and Strength. Includes items for footings and piers (4,000 PSI), grade beams (4,000 PSI), foundation walls (4,000 PSI), non-shrink grout (8,000 PSI), slab on grade (4,000 PSI), concrete on steel deck (4,000 PSI), concrete housekeeping pads and fill slabs (4,000 PSI), and concrete shearwalls (4,000 PSI).

CM-2 PROVIDE NORMAL WEIGHT CONCRETE WITH CURED DENSITY OF 145 +/- 5 PCF, AND AGGREGATE CONFORMING TO ASTM C33, UON. WHERE INDICATED, PROVIDE LIGHTWEIGHT CONCRETE WITH CURED DENSITY OF 112+/-3 PCF AND AGGREGATE CONFORMING TO ASTM C330.

CM-3 THE USE OF CALCIUM CHLORIDE AND OTHER CHLORIDE CONTAINING AGENTS IS PROHIBITED. THE USE OF RECYCLED CONCRETE IS PROHIBITED. PLACEMENT WITHIN AND CONTACT BETWEEN ALUMINUM ITEMS, INCLUDING ALUMINUM CONDUIT, AND CONCRETE IS PROHIBITED.

RE CONCRETE REINFORCEMENT

RE-1 ALL CONCRETE SHALL INCLUDE REINFORCEMENT. IF REINFORCEMENT IS NOT SPECIFICALLY INDICATED ON THE DRAWINGS VERIFY WITH THE STRUCTURAL ENGINEER.

RE-2 REINFORCEMENT SHALL CONFORM TO THE FOLLOWING STANDARDS AND MATERIAL PROPERTIES: DEFORMED BARS: ASTM A615, GRADE 60 WELDABLE DEFORMED BARS: ASTM A706 EPOXY COATED DEFORMED BARS: ASTM A615 / A775 WELDED WIRE REINFORCEMENT: ASTM A185 EPOXY COATED WELDED WIRE REINFORCEMENT: ASTM A185 / A884

RE-3 DETAIL REINFORCEMENT BASED ON THE PROJECT REQUIREMENTS, ACI-318 AND ACI-315, UON.

RE-4 WHERE A 90-DEG, 135-DEG OR 180-DEG HOOK IS GRAPHICALLY INDICATED, PROVIDE CORRESPONDING ACI STANDARD HOOKS UON.

RE-5 DOWELS SHALL MATCH SIZE AND SPACING OF MAIN REINFORCEMENT UON.

RE-6 REINFORCEMENT SHALL HAVE CONCRETE PROTECTION (CLEAR COVER) PER ACI 318 UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

RE-7 LAP REINFORCEMENT AS SPECIFICALLY DETAILED ON THE DRAWINGS. SEE LAP SPLICE AND DEVELOPMENT SCHEDULE.

RE-8 UNLESS OTHERWISE NOTED ALL LAP SPLICES ARE TO BE TENSION LAP SPLICES PER LAP SPLICE AND EMBEDMENT SCHEDULE.

RE-9 PROVIDE MECHANICAL SPLICES FOR BARS LARGER THAN #11 OR WHERE INDICATED. PROVIDE TENSILE, PRE-QUALIFIED, WELDED OR THREADED MECHANICAL SPLICES UON.

RE-10 LAP WELDED WIRE REINFORCEMENT TWO PANEL SPACINGS, UON.

RE-11 PROVIDE LAP LOCATIONS AS FOLLOWS, UON: A. GRADE BEAM / WALL (TOP HORIZONTAL REINFORCEMENT): AT CENTER OF SPAN B. GRADE BEAM / WALL (BOTTOM HORIZONTAL REINFORCEMENT): AT SUPPORTS C. WALL INSIDE FACE (VERTICAL REINFORCEMENT): AT SUPPORT D. WALL OUTSIDE FACE (VERTICAL REINFORCEMENT): AT MIDTHIGHT OF WALL E. UNLESS OTHERWISE NOTED TERMINATE BARS AT DISCONTINUOUS ENDS WITH STANDARD HOOKS.

RE-12 PROVIDE EPOXY COATED REINFORCEMENT AND ACCESSORIES IN AREAS OF DIRECT EXPOSURE TO THE ENVIRONMENT, CHEMICALS, OR DE-ICING FOR THE AREAS INDICATED ON THE DRAWINGS.

CJ CONCRETE CONSTRUCTION JOINTS

CJ-1 PROVIDE CONSTRUCTION JOINTS IN ACCORDANCE WITH ACI-318. SUBMIT SHOP DRAWINGS SHOWING PROPOSED CONSTRUCTION JOINT LOCATIONS, DETAILS AND THE PLACEMENT SEQUENCE FOR THE STRUCTURAL ENGINEER'S APPROVAL PRIOR TO PROCEEDING WITH WORK.

CJ-2 NO HORIZONTAL CONSTRUCTION JOINTS WILL BE PERMITTED IN BEAMS, UPTURNED BEAMS, WALLS AND SLABS UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS OR APPROVED IN WRITING BY THE DESIGN PROFESSIONALS PRIOR TO CONSTRUCTION.

CJ-3 PLACE VERTICAL CONSTRUCTION JOINTS TO PROVIDE A 60 FT MAXIMUM LENGTH OF CONCRETE PLACEMENT AND LOCATE AS FOLLOWS: A. FOUNDATION WALLS: MINIMUM OF 8 FT FROM ANY WALL INTERSECTION, PLASTER, PIER, OR WALL OPENING B. GRADE BEAMS SUPPORTING FOUNDATION WALLS: AT CENTERLINES BETWEEN SUPPORTS

CJ-4 PROVIDE CONTINUOUS WATERSTOPS AT ALL CONSTRUCTION JOINTS EXPOSED TO SOIL OR WATER, AS DESCRIBED IN THE SPECIFICATIONS.

MA MASONRY

MA-1 LOAD BEARING AND BACKUP WALL CONCRETE MASONRY CONSTRUCTION SHALL CONFORM TO THE FOLLOWING MATERIAL STANDARDS:

CONCRETE BLOCK: ASTM C90, NORMALWEIGHT - TYPE I ASTM C270. SEE PROJECT SPECIFICATIONS FOR TYPE MORTAR: SEE PROJECT SPECIFICATIONS JOINT REINFORCEMENT: ASTM A615, GRADE 60 EXTERIOR JT REINF: GALVANIZE PER ASTM A153 INTERIOR JT REINF: GALVANIZE PER ASTM A641

MA-2 THE MINIMUM COMPRESSIVE STRENGTH OF THE MASONRY (F' M) SHALL BE 1,500 PSI, UON, AS DETERMINED IN ACCORDANCE WITH THE ABOVE REFERENCED SPECIFICATIONS FOR MASONRY STRUCTURES.

MA-3 PLACE MASONRY UNITS WITH FULL FACESHELL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS. WEBS SHALL ALSO HAVE FULL MORTAR COVERAGE AROUND ALL GROUTED CELLS.

MA-4 LAY MASONRY UNITS IN RUNNING BOND UON.

MA-5 REINFORCE MASONRY WALLS WITH HORIZONTAL JOINT REINFORCEMENT AT 16" OC MAXIMUM.

MA-6 INTERLOCK WALLS AT INTERSECTIONS AND CORNERS WITH METAL TIES, ANCHORS OR JOINT REINFORCEMENT. SEE THE SPECIFICATIONS FOR DETAILS.

MA-7 GROUT SOLID CELLS WITH VERTICAL REINFORCING AND BOND BEAMS.

MA-8 GROUT MINIMUM OF TWO (2) CELLS, WITH REINFORCEMENT IN EACH CELL AS INDICATED ON DRAWINGS, AT EACH SIDE OF ALL OPENINGS.

MA-9 CALCIUM CHLORIDE SHALL NOT BE USED IN MORTAR OR GROUT.

SS STRUCTURAL STEEL

SS-1 STEEL MATERIALS SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS:

ROLLED SHAPES AND CHANNELS: ASTM A572 OR A992, MIN. YIELD STRENGTH 50 KSI ANGLES BRACES: ASTM A36 MIN YIELD STRENGTH 36 KSI MISCELLANEOUS ANGLES: ASTM A36 HOLLOW STRUCTURAL SECTIONS: ASTM A500 GRADE B, MIN YIELD STRENGTH 42 KSI FOR ROUND AND 46 KSI FOR RECTANGULAR HSS. ASTM A53 GRADE B, TYPE S, MIN YIELD STRENGTH 35 KSI. ASTM A36 MIN YIELD STRENGTH 36 KSI SEAMLESS PIPE: PLATES: ASTM A572 OR A992, MIN. YIELD STRENGTH 50 KSI

SS-2 CONNECTION MATERIAL SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS OR AS NEEDED FOR CONNECTION DESIGN:

ANGLES: ASTM A36 WTS: ASTM A992 ANGLES: ASTM A36, MINIMUM YIELD STRENGTH 36 KSI BOLTS: ASTM A325 OR A490 NUTS: ASTM A563 WASHERS: ASTM F436 ANCHOR RODS: ASTM F1554 GRADE 55 WITH WELDABILITY SUPPLEMENT S1 HEADED STUDS: ASTM A 108, GRADE: 1010 THROUGH 1020 HEADED STUD TYPE, COLD-FINISHED CARBON STEEL, AWS D1.1, TYPE B, 3/4" DIA UON WELD ELECTRODES: E70XX

SS-3 WHERE NO CAMBER IS INDICATED, FABRICATE BEAMS SO THAT ANY NATURAL CAMBER IS UPWARD AFTER ERECTION.

SS-4 SPLICES SHALL BE ALLOWED ONLY AT LOCATIONS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS UNLESS APPROVED OTHERWISE BY THE SER IN WRITING.

SS-5 FOR STEEL MEMBERS AND EMBEDMENTS EXPOSED TO WEATHER, PROVIDE HOT-DIPPED GALVANIZED FINISH, UON.

SS-6 PROVIDE HOLES IN ALL STEEL AS REQUIRED TO PREVENT ANY ACCUMULATION OF WATER. ALL PENETRATIONS THROUGH MAIN MEMBERS SHALL NOT EXCEED 1 1/8" DIA. AND SHALL BE GROUND SMOOTH. THESE DRAINS MUST BE KEPT CLEAN AND OPEN.

SS-7 SHOW ALL COPES, HOLES, OPENINGS AND MODIFICATIONS REQUIRED IN STRUCTURAL STEEL MEMBERS FOR ERECTION OR THE WORK OF OTHER TRADES ON THE SHOP DRAWINGS FOR APPROVAL BY THE ARCHITECT AND STRUCTURAL ENGINEER.

SMITHGROUP architecture engineering interiors planning 35 EAST WACKER SUITE 2200 CHICAGO, IL 60601 T 312.641.0770 F 312.641.6728 www.smithgroup.com

JJR landscape architecture planning urban design interior design environmental science 35 EAST WACKER DRIVE SUITE 2200 CHICAGO, ILLINOIS 60601 312.641.0510 T 312.641.0668 F www.jjr-us.com

A/E Affiliated Engineers Affiliated Engineers, Inc. 5802 Research Park Boulevard Madison, Wisconsin 53719 Tel 608.238.2618 Fax 608.238.2614

Thornton Tomasetti Thornton Tomasetti, Inc. 330 N. Wabash Avenue, Suite 1500 Chicago IL 60611-7622 T 312.596.2000 F 312.596.2001