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GENERAL STRUCTURAL NOTES

CODE REQUIREMENTS: ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE UNIFORM BUILDING CODE, 1985 EDITION, AS AMENDED BY THE STATE OF OREGON AND THE CITY OF PORTLAND.

DESIGN LOADS: IN ADDITION TO THE STRUCTURAL DEAD LOADS, THE FOLLOWING NON-REDUCABLE LOADS WERE USED FOR DESIGN:

ROOF:
EXHIBIT HALLS AND BALLROOM — 12 PSF ROOFING; 5 PSF MISCELLANEOUS; 25 PSF SNOW (SNOW DRIFT AS SHOWN ON PLANS)

NOTE 1: EXHIBIT HALL OPEN WEB JOISTS MAY HAVE AN ADDITIONAL VERTICAL HANGING LOAD OF 9 PSF SUPPORTED FROM BOTTOM CHORD PANEL POINTS PROVIDED SUCH LOADING IS REMOVED WHEN SNOW IS PRESENT OR FORCAST.

4 2. TRUSSES T-1, T-1A, T-2, T-3 AND T-3A ARE DESIGNED TO CARRY AN ADDITIONAL 10 PSF VERTICAL HANGING LOAD TO BE APPLIED AT BOTTOM CHORD PANEL POINTS. SUCH VERTICAL LOADS SHALL NOT INDUCE HORIZONTAL FORCES ON THE BOTTOM CHORD. THIS LOADING IS EQUIVALENT TO AN ADDITIONAL 4000 LBS. VERTICAL LOAD AT EACH BOTTOM CHORD PANEL POINT OF THESE TRUSSES. ISOLATED HEAVIER LOADS ARE PERMISSIBLE PROVIDED SHEARS AND MOMENTS ON THE TRUSSES DO NOT EXCEED THOSE IMPOSED BY THE 4000 LBS. POINT LOADS.

STORAGE AREA	12 PSF ROOFING 5 PSF MISCELLANEOUS 25 PSF SNOW (SNOW DRIFT AS SHOWN ON PLANS) 100 PSF MECHANICAL IN SPECIFIED AREAS
STRUCTURAL FLOORS:	
BALLROOM, LOBBIES	10 PSF MISCELLANEOUS 125 PSF LIVE LOAD
MECHANICAL	10 PSF MISCELLANEOUS 50 PSF LIVE LOAD OR ACTUAL MECHANICAL LOAD
STORAGE AT EL. 94'	10 PSF MISCELLANEOUS 125 PSF LIVE LOAD
GLAZED TOWERS:	10 PSF GLAZING 10 PSF MISCELLANEOUS (ON HORIZONTAL PROJECTION) 25 PSF SNOW (SNOW DRIFT AS SHOWN ON PLANS)
SLAB-ON-GRADE:	
EXHIBIT HALL, STORAGE	350 PSF LIVE LOAD OR HS20 TRUCK LOAD
MEETING ROOMS, PRE-FUNCTION	125 PSF LIVE LOAD
WIND:	80 MPH, EXPOSURE B, I = 1.15 SEE SPECS FOR GLAZED TOWER CLADDING WIND LOADS AND ROOF UPLIFT WIND LOADS

EARTHQUAKE DESIGN IS BASED UPON THE FOLLOWING:

Z = .375, I = 1.25, K = 1.33, CS = .14, V = 2130^{K} AT BASE

SUBMITTALS: SHOP DRAWINGS SHALL BE SUBMITTED PRIOR TO FABRICATION AND CONSTRUCTION FOR ALL STRUCTURAL ITEMS INCLUDING THE FOLLOWING: CONCRETE MIX DESIGNS, CONCRETE AND MASONRY REINFORCEMENT INCLUDING MILL TEST REPORTS, PRECAST OR PRESTRESSED CONCRETE MEMBERS, EMBEDDED STEEL ITEMS, STRUCTURAL STEEL INCLUDING MILL TEST REPORTS, STEEL JOISTS, STEEL DECK AND STEEL STUDS.

IF THE SHOP DRAWINGS DIFFER FROM OR ADD TO THE DESIGN OF THE STRUCTURAL DRAWINGS, THEY SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER, REGISTERED IN THE STATE OF OREGON.

DESIGN DRAWINGS, SHOP DRAWINGS, AND CALCULATIONS FOR THE DESIGN AND FABRICATION OF ITEMS THAT ARE DESIGNED BY OTHERS, SUCH AS: PRECAST PANELS, PRESTRESSED CONCRETE, OPEN WEB STEEL JOISTS, ALUMINUM FRAMED GLAZED TOWER, AND STOREFRONT SYSTEM, SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER, REGISTERED IN THE STATE OF OREGON, AND SHALL BE SUBMITTED PRIOR TO FABRICATION.

INSPECTION: SPECIAL INSPECTION, BY AN APPROVED SPECIAL INSPECTOR, SHALL BE PERFORMED FOR SOILS COMPACTION, PILING INSTALLATION, CONCRETE AND REINFORCING PLACEMENT, PRECAST CONCRETE PLACEMENT, STEEL FABRICATION AND ERECTION, EXPANSION ANCHOR PLACEMENT, HIGH-STRENGTH BOLTING, WELDING, STRUCTURAL MASONRY PLACEMENT, SPRAY-APPLIED FIREPROOFING, AND CURTAINWALL INSTALLATION. ALL SOIL-BEARING SURFACES SHALL BE INSPECTED BY THE SOILS ENGINEER PRIOR TO PLACEMENT OF REINFORCING STEEL.

CONCRETE: CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF CHAPTER 26 OF THE UNIFORM BUILDING CODE. CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS AND SHALL BE AS FOLLOWS:

f'c (PSI)	USE
4000	ALL USES UNLESS NOTED
5000	PRECAST ELEMENTS
6000	PRECAST PILES

THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS TWO WEEKS PRIOR TO PLACING ANY CONCRETE. THE MIX DESIGN SHALL CONFORM TO UBC SECTION 2604.

A WATER-REDUCING ADMIXTURE CONFORMING TO UBC STANDARD NO. 26-9, USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, SHALL BE INCORPORATED IN CONCRETE DESIGN MIXES. AN AIR ENTRAINING AGENT, CONFORMING TO THE UBC STANDARD NO. 26-9, SHALL BE USED IN ALL CONCRETE MIXES FOR EXTERIOR HORIZONTAL SURFACES EXPOSED TO WEATHER. THE AMOUNT OF ENTRAINED AIR SHALL BE 5% ± 1% BY VOLUME.

REINFORCING STEEL: REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ASTM A615, INCLUDING ST, GRADE 60, FOR DEFORMED BARS AND ASTM A185 FOR SMOOTH WELDED WIRE FABRIC (WWF), UNLESS OTHERWISE NOTED. REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE WITH #16 DOUBLE ANNEALED IRON WIRE.

BARS IN GRADE BEAMS AND SLABS SHALL BE SUPPORTED ON WELL-CURED CONCRETE BLOCKS OR APPROVED METAL CHAIRS AS SPECIFIED BY THE CRSI MANUAL OF STANDARD PRACTICE, MSP-1-86. REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE "ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES," ACI 315-80. REINFORCING STEEL FABRICATION AND PLACEMENT DRAWINGS SHALL INCLUDE SECTIONS AND ELEVATIONS INDICATING BAR SIZE, QUANTITY AND PLACEMENT LOCATION. LAP ALL REINFORCING BARS AT SPLICES 36 DIAMETERS, WITH A MINIMUM LAP OF 18", EXCEPT AS NOTED.

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REINFORCING STEEL SHALL HAVE PROTECTION AS FOLLOWS:

USE	COVER
SLAB BARS	1"
WALL BARS: INTERIOR FACES	3/4"
EXPOSED TO EARTH OR WEATHER	1-1/2" (#5 AND SMALLER) 2" (#6 AND LARGER)
FOOTING AND PILE CAP BARS	3"
PRECAST WALL PANELS	
INTERIOR FACES	3/4"
EXPOSED TO EARTH OR WEATHER	1"
PRECAST BEAM AND COLUMN BARS	1-1/2" (TO STIRRUPS OR TIES)

CONCRETE WALL REINFORCING (UNLESS OTHERWISE NOTED):

WALL THICKNESS	HORIZONTAL BARS	VERTICAL BARS	LOCATION
6"	#4 @ 16" O.C.	#3 @ 12" O.C.	@ CL OF WALL
8"	#4 @ 12" O.C.	#4 @ 16" O.C.	@ CL OF WALL
10"	#4 @ 18" O.C.	#3 @ 16" O.C.	@ EACH FACE
12"	#4 @ 16" O.C.	#3 @ 12" O.C.	@ EACH FACE

AT ALL OPENINGS PROVIDE A MINIMUM OF TWO BARS OVER, UNDER AND AT SIDES, OF THE SAME SIZE AS THE PRINCIPAL WALL REINFORCING. EXTEND THESE BARS LAP DISTANCE OR A MINIMUM OF 24" PAST THE OPENING. PROVIDE ONE #5 FOR SINGLE LAYER REINFORCING AND TWO #5 FOR DOUBLE LAYER REINFORCING, 4'-0" LONG, DIAGONALLY AT EACH CORNER OF ALL OPENINGS. REFER TO TYPICAL DETAILS FOR DISPOSITION OF CORNER BARS AND BARS IN SMALL WALL SECTIONS.

PRECAST CONCRETE: CONCRETE MIXES AND CODE CONFORMANCE SHALL BE AS REQUIRED BY NOTES UNDER "CONCRETE" ABOVE: F'c = 5000 PSI MINIMUM. THE REINFORCING SHOWN IS THE REQUIRED MINIMUM. THE CONTRACTOR SHALL PROVIDE ANY ADDITIONAL REINFORCING REQUIRED FOR HANDLING AND ERECTION.

PRESTRESSED CONCRETE: PRESTRESSED CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 5000 PSI AT 28 DAYS, AS SUBSTANTIATED BY STANDARD CYLINDER TESTS. DESIGN OF PRESTRESSED MEMBERS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. ALL MEMBERS SHALL BE DESIGNED TO RESIST THE LOADS INDICATED ON THE DRAWINGS. CONCRETE SHALL NOT CONTAIN MORE THAN .06 PERCENT CHLORIDE ION BY WEIGHT.

CONCRETE MASONRY: CONCRETE MASONRY UNITS SHALL COMPLY WITH ASTM C90, GRADE N-I. ASSEMBLIES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF F'm = 1500 PSI AS VERIFIED BY PRISM TESTS. CONCRETE MASONRY WALLS SHALL BE REINFORCED AS SHOWN ON THE PLANS AND DETAILS AND IF NOT SHOWN SHALL BE AS NOTED UNDER "MASONRY REINFORCING STEEL".

MORTAR: MORTAR SHALL BE TYPE S WITH A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 1800 PSI AND SHALL CONFORM TO UBC SECTIONS 2402 AND 2403.

MASONRY GROUT: GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 2000 PSI AND SHALL CONFORM TO UBC SECTIONS 2402 AND 2403. GROUT SHALL CONSIST OF A MIXTURE OF CEMENTITIOUS MATERIALS AND AGGREGATE TO WHICH SUFFICIENT WATER HAS BEEN ADDED TO CAUSE THE MIXTURE TO FLOW WITHOUT SEGREGATION OF THE CONSTITUENTS. ALL CELLS CONTAINING VERTICAL BARS AND ALL BOND BEAMS SHALL BE FILLED WITH GROUT.

MASONRY REINFORCING STEEL: REINFORCING SHALL CONFORM TO UBC SECTION 2402(b)10. DEFORMED BARS SHALL BE GRADE 40 AND SHALL BE SECURELY PLACED IN ACCORDANCE WITH UBC SECTION 2404(a). UNLESS OTHERWISE NOTED ON THE PLANS THE MINIMUM WALL REINFORCEMENT SHALL BE AS FOLLOWS:

WALL THICKNESS	VERTICAL BARS	HORIZONTAL BARS (IN BOND BEAMS) RUNNING BOND	STACK BOND
4"	#4 @ 48" O.C.	#4 @ 48" O.C.	#5 @ 48" O.C.
6"	#5 @ 48" O.C.	#5 @ 48" O.C.	#6 @ 48" O.C.
8"	#6 @ 48" O.C.	(2)#4 @ 48" O.C.	(2)#5 @ 48" O.C.
10"	#6 @ 48" O.C.	(2)#5 @ 48" O.C.	(2)#6 @ 48" O.C.
12"	#7 @ 48" O.C.	(2)#5 @ 48" O.C.	(2)#6 @ 48" O.C.

BOND BEAMS WITH TWO #5 BARS HORIZONTALLY SHALL BE PROVIDED AT ALL FLOOR AND ROOF LINES AND AT THE TOP OF WALLS. PROVIDE A BOND BEAM WITH TWO #5 BARS HORIZONTALLY ABOVE AND BELOW ALL OPENINGS, AND EXTEND THESE BARS 2'-0" PAST THE OPENING AT EACH SIDE. PROVIDE ONE #5 BAR VERTICALLY FOR THE FULL HEIGHT OF THE WALL AT EACH SIDE OF OPENINGS, WALL ENDS AND INTERSECTIONS. DOWELS TO MASONRY WALLS SHALL BE EMBEDDED A MINIMUM OF 1'-6" OR HOOKED INTO THE SUPPORTING STRUCTURE AND BE OF THE SAME SIZE AND SPACING AS WALL REINFORCING. PROVIDE CORNER BARS TO MATCH THE HORIZONTAL WALL REINFORCING AT WALL INTERSECTIONS. LAP ALL BARS AT SPLICES 40 DIAMETERS, WITH A MINIMUM LAP OF 18", EXCEPT AS NOTED.

STRUCTURAL STEEL: STRUCTURAL STEEL SHALL BE ASTM A36 OR ASTM A572 GRADE 50 AS NOTED. TUBES SHALL BE ASTM A500 GRADE B (Fy = 46 KSI). PIPES SHALL BE ASTM A501 OR ASTM A53, GRADE B. DESIGN, FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS". BOLTS SHALL CONFORM TO THE ASTM SPECIFICATION FOR A325, HIGH STRENGTH BOLTS. COMPRESSIBLE WASHER TYPE DIRECT TENSION INDICATORS CONFORMING TO ASTM F959, SHALL BE USED WITH ALL A325, HIGH STRENGTH BOLTS. WELDING SHALL CONFORM TO THE AWS CODES FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. WELDS SHALL BE MADE USING E70XX ELECTRODES AND SHALL BE 3/16" MINIMUM UNLESS OTHERWISE NOTED. WELDING SHALL BE BY CITY OF PORTLAND CERTIFIED WELDERS.

STEEL DECK: STEEL FLOOR DECK SHALL BE A COMPOSITE TYPE DECK WITH RIBS AT 12" O.C., OF THE SIZE AND GAGE SHOWN ON THE PLANS. FLOOR DECK EDGE FORMS SHALL BE 14 GAGE GALVANIZED, UNLESS NOTED OTHERWISE ON THE DRAWINGS. STEEL ROOF DECK SHALL BE 3" TYPE N OF THE GAGE SHOWN ON THE DRAWINGS. STEEL DECK SHALL CONFORM TO ASTM A446, GRADE A MINIMUM. THE GALVANIZED COATING SHALL CONFORM TO ASTM A525, G60.

MINIMUM DECK GAGES ARE SHOWN ON PLANS AND ARE BASED ON 3-SPAN, UNSHORED CONDITIONS, AND MINIMUM PROPERTIES AS FOLLOWS:

	I (IN^4/FT)	S (IN^3/FT)
FLOOR DECK:		
3"-20 GAGE	0.896	0.486
ROOF DECK:		
3"-18 GAGE	1.222	0.731
3"-20 GAGE	0.780	0.486

FLOOR DECK WELDING SHALL BE AS FOLLOWS:

1/2" DIAMETER PUDDLE WELDS AT 12" O.C. AT TRANSVERSE AND PERIMETER SUPPORTS
1/2" DIAMETER PUDDLE WELDS AT 16" O.C. AT LONGITUDINAL SUPPORTS
BUTTON PUNCH OR 1-1/2" TOP OR SIDE SEAM WELD AT 36" O.C. AT SIDE LAP CONNECTIONS

ROOF DECK SHALL BE ATTACHED TO SUPPORTS AND AT SIDE LAPS AS REQUIRED TO RESIST THE DIAPHRAGM SHEARS SHOWN ON THE DRAWINGS.

STEEL JOISTS: STEEL JOISTS SHALL BE DESIGNED TO RESIST THE LOADS INDICATED ON THE DRAWINGS AND SHALL CONFORM TO THE REQUIREMENTS OF THE STEEL JOIST INSTITUTE (SJI) STANDARDS. PROVIDE BRIDGING IN CONFORMANCE WITH SJI STANDARDS. BRIDGING SHALL BE CAPABLE OF RESISTING THE WIND UPLIFT LOADS NOTED ON THE DRAWINGS. THE TOP CHORD OF ALL JOISTS OVER THE EXHIBIT HALL AND PREFUNCTION SPACE SHALL BE DESIGNED FOR AN ADDITIONAL ±6 KIPS AXIAL FORCE UNLESS HIGHER LOADS ARE INDICATED ON THE PLANS. THE TOP CHORD OF ALL OTHER JOISTS SHALL BE DESIGNED FOR AN ADDITIONAL ±3 KIPS AXIAL FORCE UNLESS HIGHER LOADS ARE INDICATED ON THE PLANS. ALL JOISTS SHALL BE DESIGNED FOR AN ADDITIONAL VERTICAL LOAD OF 500 POUNDS, WHICH MAY BE APPLIED AT ANY BOTTOM CHORD PANEL POINT.

CLOSED END STEEL PIPE PILES: STEEL PIPE PILES SHALL CONFORM TO ASTM A-53 Fy = 35 KST OR EQUAL IN STRENGTH AND WELDABILITY. PIPE PILES SHALL MEET THE FOLLOWING REQUIREMENTS:

PILE DESIGNATION (DIAMETER)	MINIMUM DIA.	MAXIMUM DIA.	MINIMUM AREA	MIN. WALL THICK.	CAPACITY	HAMMER MAXIMUM ENERGY FT-LBS
10"	9-5/8"	10-3/4"	13.2 IN^2	.46"	83 TONS	20,000
14"	10"	14"	25.7 IN^2	.63"	162 TONS	30,000

PILES SHALL BE DRIVEN TO A TERMINAL BLOWCOUNT OF 10 BLOWS/INCH. DRIVING CRITERIA ARE APPROXIMATE ONLY. ACTUAL CRITERIA SHALL BE BASED UPON THE CONTRACTOR'S PROPOSED EQUIPMENT.

PRECAST PILES ALTERNATE: PRECAST PILES SHALL BE 10" SQUARE OR 14" SQUARE. CONCRETE MIXES AND CODE CONFORMANCE SHALL BE AS REQUIRED BY NOTES UNDER "CONCRETE" ABOVE: F'c = 6000 PSI MINIMUM.

PILE TYPE	DESIGN LOAD	HAMMER MAX. ENERGY
10" SQUARE	83 TONS	20,000 FT-LBS
14" SQUARE	162 TONS	30,000 FT-LBS

PILES SHALL BE DRIVEN TO A TERMINAL BLOWCOUNT OF 10 BLOWS/INCH. DRIVING CRITERIA ARE APPROXIMATE ONLY. ACTUAL CRITERIA SHALL BE BASED UPON THE CONTRACTOR'S PROPOSED EQUIPMENT.

CANCAN A. & E. SUPPLIES CO.

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GENERAL STRUCTURAL NOTES & DRAWING INDEX

OREGON CONVENTION CENTER
"Bid Package 3" - General Contract
PORTLAND, OREGON

REGISTERED PROFESSIONAL ENGINEER
OREGON
APR. 18, 1972
ARTHUR W. JOHNSON

Job No. 6060-05

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Of Sheets