Wannemacher Jensen
Architects, Inc.

December 27, 2023

Jeff Walker, P.E. CBO, LEED AP, PMP
Sr. Professional Engineer
City of Clearwater Dept. of Public Works
1501 N. Belcher Rd.
Clearwater, FL

RE: The Long Center Natatorium Life Cycle Analysis

Mr. Walker

WJ Architectecs has completed the Life Cycle Analysis associated with The Long Center Natatorium. Our process and findings are described in the following pages and documents.

Should there be any question regarding this study please don't hesitate to contact Arturo Lopez via email at Arturo.lopez@wjarc.com or by phone at 727.308.2432. We look forward to working with you again in the future on this project or other projects.

Respectfully Submitted,

WJ Architects

Arturo D. Lopez AIA
Studio Director / Project Manager

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Project Information & Intent

The Long Center Natatorium is in the City of Clearwater at 1501 N Belcher Rd. it houses two swimming pools that are used for community events and swim competitions. The building is a single-story structure, composed of an exposed steel and single pane window system envelope along the north,

Project Information & Intent

The Long Center Natatorium is in the City of Clearwater at 1501 N Belcher Rd. it houses two swimming pools that are used for community events and swim competitions. The building is a single-story structure, composed of an exposed steel and single pane window system envelope along the north, west, and east facades. The south wall of the natatorium is an interior wall separating the natatorium from office space and other interior spaces. It's estimated that the natatorium is approximately 30 years old, because of its age, design, and exposure to the chemicals associated with maintaining the pools the natatorium has experienced significant structural decay, is expensive to operate, and is unable to provide a comfortable environment or pleasant experience for the public it serves. The Long Center Natatorium is in need of significant repairs and renovations to all of its major building systems and components.

The City of Clearwater has hired WJ Architects to provide a life cycle cost analysis that includes two design options for renovating the natatorium. The life cycle cost analysis will help the city decide on the most cost effective and energy efficient approach for renovating the natatorium. The goal of the life cycle analysis is to identify the energy use, operating cost, maintenance cost and total budget cost associated with each design option. It's expected that the city will then use this information to select a path forward for renovating the Long Center Natatorium.

Process

WJ Architects designed two renovation options for the natatorium that are described as follows; Option one keeps the intent of the original design by maintaining the "Glass Box" concept, meaning the amount of glazing is maximized along the exterior perimeter of the natatorium. Option two, looks to improve the energy efficiency of the natatorium by reducing the amount of glazing along the perimeter of the building. Both design options included replacement and upgrades to building systems and components including HVAC systems, photovoltaic panels, roofing, structural repairs, and pool equipment. Each design option was modeled in 3D and organized into a set of documents that was presented to our team of estimators for pricing. Our 3D models we're also used to create energy analysis models that revealed the impact of reducing the glazing and the efficiency of the natatoriums . We finalized our analysis by performing a non-destructive evaluation (NDE) of steel the structure of the building via a specialty scanner that can determine the thickness of each steel member. Through comparative analysis, a determination was made on whether each steel member required repair or replacement. A report is provided herein that identifies said structural members.

Findings

Upon completion of our energy analysis, and cost estimates it was determined that option two, "the less glazing option" would be more cost effective to build and ten to fifteen percent more energy efficient than option one, the "Glass Box Option". This conclusion is based on the following factors:

1. Design
    a. The difference between the two design options is limited to the area of glazing and exterior wall surface area, with option one having a larger surface area of glazing and less wall surface area of wall, and option two having a smaller surface area of glazing and larger exterior wall surface area.

b. The HVAC system in both design options is the same size and configuration. This is because the HVAC load for the building is determined by the latent heat created by maintaining the pool temperature not the heat gained through the fenestration.

2. Cost
    a. The 30yr cost associated with the mechanical system in option two is 10% - 15% less expensive. This analysis factors installation cost, energy use, maintenance, and replacement cost. Energy use is the driving factor in this analysis with option two being more energy efficient.
    b. The overall estimated construction cost for the project is identified as less expensive for option two by both cost estimators estimating the cost of the project.
    c. Here are the total sums provided by each estimator
        i. CC&A – Price Estimate for Renovation Option Two
            1. Renovation Cost: $12,882,358
                a. Includes pool equipment UV system upgrade.
                b. Includes $300,000 Allowance for PV panels.
            2. Sun Deck Addition: $ 479,379
            3. **Total** **$ 13,361,737**
                a. Pool equipment replacement not included.
        ii. WJ Create – Price Estimate for Renovation Option Two
            1. Renovation Cost: $ 9,242,362
                a. Includes pool equipment UV System upgrade.
                b. Includes $468,000 allowance for PV panels.
            2. Sun Deck Addition: $ 759,939
            3. **Total** **$ 10,002,301**
                a. Pool equipment replacement not included
        iii. Pool Equipment Total Replacement: $ 1,092,520
3. Performance
    a. The energy model revealed that option 2 uses about 10% - 15% less energy than option one.

Appendix

LONG CENTER NATATORIUM OPTION 1

1501 N BELCHER RD. CLEARWATER FL, 33765

MILESTONE HERE

No.	Description	Date
	SCHEMATIC BID SET	10.23.23

PREPARED FOR:

City of Clearwater

X _____ _____

CLIENT SIGNATURE AUTHORIZING PRODUCTION DOCUMENTS TO PROCEED INTO NEXT PHASE **DATE**

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AA0002277

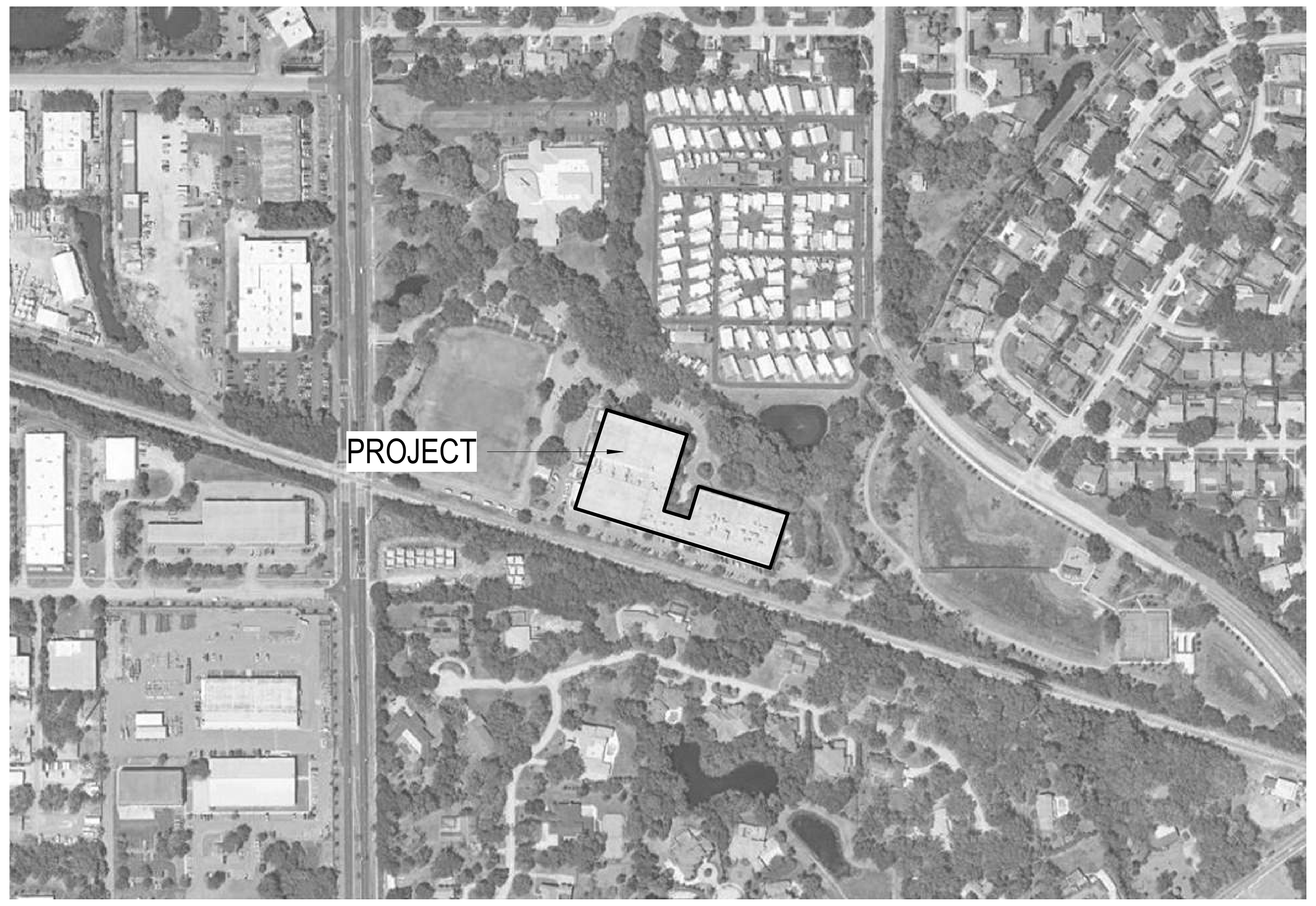
STRUCTURAL ENGINEER
McKim & Creed
1365 Hamlet Ave. Clearwater, FL. 33756

MEP & FP ENGINEER
Emerald Engineering
9942 Currie Davis Dr. Ste H. Tampa, FL. 33619

SWIMMING POOL ENGINEER
Councilman Hunsaker
3636 Geyer Rd, Suite 100, St. Louis, MO. 63127

11/28/2023 5:02:54 PM

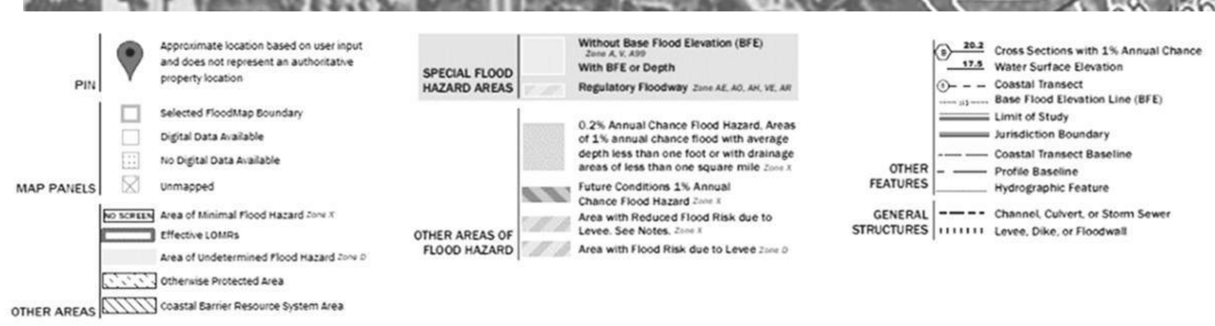
SITE LOCATION MAP



LEGAL DESCRIPTION

Parcel Number: 07-29-16-00000-220-0100. PART OF NW 1/4 OF SEC 7-29-16 DESD FROM NW SEC COR TH S89D35'50"E 55FT TO E R/W OF BELCHER RD TH S00D04'51"E 480.50FT FOR POB TH S89D35'50"E 662.69 FT TO C/L OF CREEK TH SE'LY ALG C/L S33D42'24"E 10.60FT TH S20D46'23"E 139.50FT TH S01D02'42"E 100.92FT TH S26D41'04"E 42.96FT TH N83D42'51"E 33.70FT TH S65D53'11"E 50.08FT TH S54D52'27"E 146.40FT TH S47D12'36"E 199.78FT TH S79D43'47"E 93.99FT TH LEAVING SD CREEK C/L S89D36'10"E 95FT TO E LINE OF NW 1/4 OF NW 1/4 OF SEC TH S00D23'50"W 324.98FT TO SE COR OF NW 1/4 OF NW 1/4 OF SD SEC TH N89D44'07"W 232.83FT TO NE'LY LINE OF SCL RR TH N72D45'16"W 1085.20FT TO E R/W OF BELCHER RD TH N00D04'51"W 539.23FT TO POB CONT 15.78AC

FEMA FLOOD MAP



FLOOD ZONE

FEMA FLOOD ZONE: FLOOD ZONE X
BASE FLOOD ELEVATION (BFE): 36.10' NA FOR ZONE X
LOWEST FFE IN PROPOSED PROJECT: 43.00' EXISTING NAVD

WIND LOADS

RISK CATEGORY (FBC TABLE 1604.5): II
ULTIMATE DESIGN WIND SPEED: 144 MPH

FLORIDA APPROVED EXTERIOR COMPONENTS & CLADDING PRODUCTS* LISTING

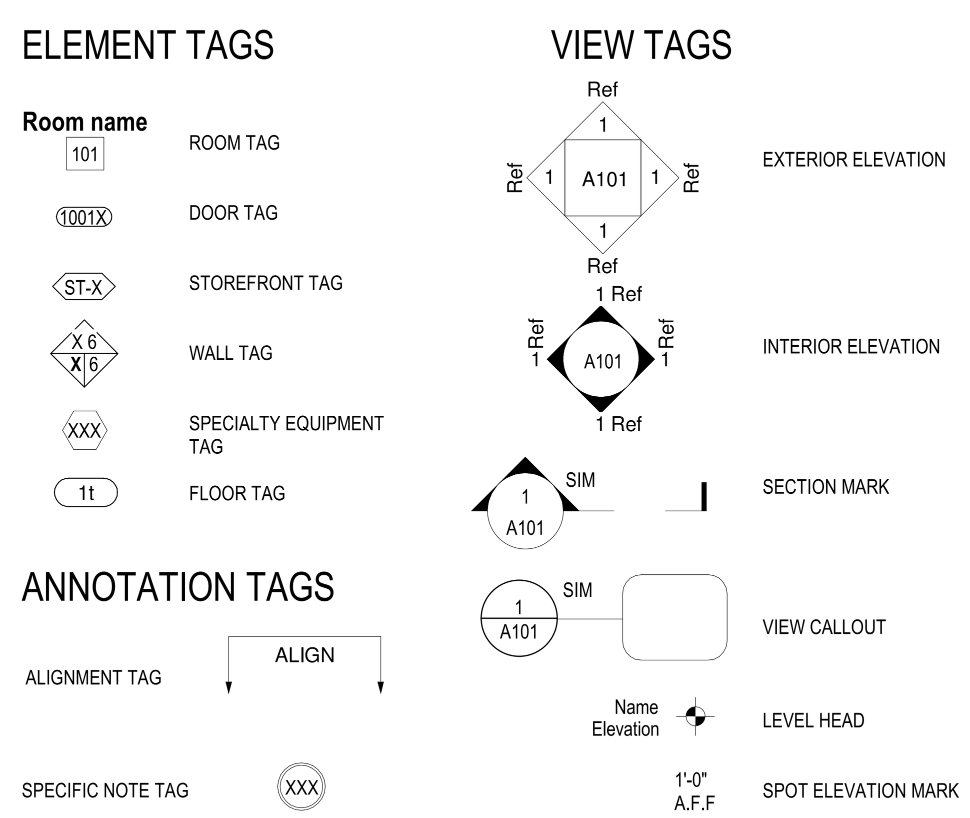
CATEGORY	SUB CATEGORY	MATERIAL	APPLICANT	DESCRIPTION	APPROVAL NUMBER
ROOFING	TPO ROFF SYSTEMS	SBS	JOHNS MANVILLE		
ROOFING	ROOF HATCH	STEEL	BILCO	SERIES NB	FL15110
EXTERIOR DOORS	SWINGING EXTERIOR DOOR ASSEMBLIES	STEEL	INGERSOLL-RAND	IR SERIES FLUSH OUTSWING	FL12400-R2
EXTERIOR DOORS	SECTIONAL EXTERIOR DOOR ASSEMBLIES	STEEL	OVERHEAD DOOR CO.	MODEL 416	FL11734.1
PANEL WALLS	STOREFRONT	ALUMINUM	YKK	AP YHS 50 FS	FL14218-R2
DOORS	STOREFRONT	ALUMINUM	YKK	35H	FL13321-R5

* BASIS-OF-DESIGN PRODUCTS: COMPARABLE PRODUCTS BY OTHER MANUFACTURERS MAY BE PROVIDED.

ABBREVIATIONS

A/C	AIR CONDITIONING
ACOUS	ACOUSTICAL
AD	AREA DRAIN
ADA	AMERICANS WITH DISABILITIES ACT
ADD	ADDITIONAL
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
APPD	APPROVED
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
AUTO	AUTOMATIC
A/V	AUDIO VISUAL
B/W	BETWEEN
BCA	BUILDING CONSTRUCTION AUTHORITY
BLDG	BUILDING
CBU	CEMENTITIOUS BACKER UNIT
CFMF	COLD FORM METAL FRAMING
CJ	CONTROL JOINT / CONSTRUCTION JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CLEANOUT
COL	COLUMN
CONC	CONCRETE
COND	CONDITION
CONN	CONNECTION
CONT	CONTINUOUS
COORD	COORDINATE
CORR	CORRIDOR
CTR	CENTER
DBL	DOUBLE
DEMO	DEMOLITION
DEPT	DEPARTMENT
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DN	DOWN
DP	DIMENSION POINT
DR	DOOR
DRN	DRAIN
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
ELEV	ELEVATION
ELEC	ELECTRICAL
ENCL	ENCLOSURE
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EWC	ELECTRICAL WATER COOLER
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
F/	FACE OF (SEE OTHER WORD)
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FEC	FIRE EXTINGUISHER CABINET
FEX	FIRE EXTINGUISHER
FF	FINISH FLOOR
FF&E	FURNITURE, FINISHES & EQUIPMENT
FHC	FIRE HOSE CABINET
FIN	FINISH
FIXT	FIXTURE
FL	FLOOR
FR	FRAME
FT	FEET
FURN	FURNITURE/ FURNISHED
FURR	FURRING
GA	GAUGE / GAGE
GALV	GALVANIZED
GC	GENERAL CONTRACT/OR
GL-xx,	GLASS
GWB	GYPSUM WALLBOARD
HB	HOSE BIBB
HCP	HANDICAPPED
HDW	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HC	HANDICAPPED
HR	HOUR
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
HVAC	HEATING, VENTILATING, AIR CONDITIONING
HW	HOT WATER
IN	INCH
INCL	INCLUDED / INCLUDING
INFO	INFORMATION
INT	INTERIOR
INTERM	INTERMEDIATE
ISA	INTNL SYMBOL OF ACCESSIBILITY
LAV	LAVATORY
LVR	LOUVER
MAINT	MAINTENANCE
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MM	MILLIMETER
MTD	MOUNTED
MTL	METAL
MULL	MULLION
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
OC	ON CENTER
OH	OVER HEAD
OPNG	OPENING
OPP	OPPOSITE
OPP HD	OPPOSITE HAND
PAV	PAVER
PERF	PERFORATED
PERIM	PERIMETER
PERP	PERPENDICULAR
PLAM	PLASTIC LAMINATE
PLBG	PLUMBING
PR	PAIR
PREFAB	PREFABRICATED
PT	PRESSURE TREATED
PTD	PAINTED
PTN	PARTITION
PTxx	PAINT
QC	QUALITY CONTROL
QTY	QUANTITY
R	RADIUS
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REC	RECESSED
REF	REFERENCE
REQ	REQUIRE / REQUIRED
REV	REVISION / REVISED
RM	ROOM
SCHED	SCHEDULE
SD	STORM DRAIN
SECT	SECTION
SF	SQUARE FEET/FOOT
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATION
SPKR	SPEAKER
SPR	SPRINKLER
SQ	SQUARE
SS	STAINLESS STEEL
SSK	SERVICE SINK
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRL	STRUCTURAL
SUSP	SUSPENDED
SYMM	SYMMETRICAL
TEL	TELEPHONE OR TELECOM
THK	THICKNESS
THRU	THROUGH
TV	TELEVISION
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UNFIN	UNFINISHED
U.N.O.	UNLESS NOTED OTHERWISE
UON	UNLESS OTHERWISE NOTED
UR	URINAL
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
W	WIDE, WIDTH
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WWF	WELDED WIRE FABRIC
XTR	EXISTING TO REMAIN

TAG LEGEND



GENERAL NOTES

1. EXISTING ITEMS AND CONDITIONS ARE DEPICTED AND DESCRIBED ON THESE DRAWINGS ACCORDING TO THE BEST AVAILABLE INFORMATION AND SURVEYS. THE ARCHITECT PROVIDES NO ASSURANCE AS TO, AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THESE DEPICTIONS AND DESCRIPTIONS. FIELD VERIFY AND DETERMINE, BY ANY MEANS NECESSARY, THE ACTUAL LOCATION, CONFIGURATION AND CONDITION OF ALL PERTINENT ITEMS, INCLUDING THOSE THAT MAY BE IN CONCEALED LOCATIONS. IF INVESTIGATION DISCOVERS THAT ACTUAL CONDITIONS DIFFER FROM WHAT IS DEPICTED OR DESCRIBED ON THESE DRAWINGS OR IF THE ITEMS AND CONDITIONS THAT ARE TO REMAIN AS PART OF THE FINISHED WORK ARE UNSUITABLE TO SUPPORT OR ACCOMMODATE THE WORK REQUIRED FOR THIS PROJECT, OR DO NOT COMPLY WITH BUILDING CODE REQUIREMENTS OR MEET CONSTRUCTION INDUSTRY STANDARDS, IMMEDIATELY NOTIFY THE ARCHITECT BY RFI AND DO NOT PROCEED WITH THE WORK UNTIL RECEIPT OF SUPPLEMENTAL INSTRUCTIONS FROM THE ARCHITECT.

2. ESTABLISH AREAS AND LIMITS OF CONSTRUCTION ACTIVITY ACCEPTABLE TO THE OWNER AND PROVIDE THE TEMPORARY FACILITIES REQUIRED TO ACCOMPLISH THE WORK INCLUDING; FIELD OFFICE, TOILETS, ELECTRIC SERVICE, SITE ACCESS, PARKING, STORAGE AND CONSTRUCTION STAGING AREAS. PROVIDE TEMPORARY WALKWAYS, DRIVEWAYS, BARRIERS, SIGNS AND ILLUMINATION TO SEPARATE AND PROTECT THE GENERAL PUBLIC FROM THE WORK RELATED ACTIVITIES. PROVIDE ACCESS ROUTES TO AND FROM AREAS OF CONSTRUCTION ACTIVITY FOR CONSTRUCTION PERSONNEL THAT COMPLY WITH ALL OSHA AND OTHER GOVERNMENT SAFETY AND ACCESSIBILITY REQUIREMENTS. ASSUME FULL LIABILITY FOR ANY DAMAGE TO ADJACENT PROPERTIES, DAMAGE TO PERSONAL PROPERTY, INJURY TO PERSONS, ETC. CAUSED BY WORK RELATED ACTIVITIES OR NEGLIGENCE.

3. PROVIDE TEMPORARY SHORING AS REQUIRED TO ADEQUATELY SUPPORT AND RETAIN EXISTING MATERIALS AND CONSTRUCTION AFFECTED BY THE WORK. PROTECT THOSE ITEMS, MATERIALS & FINISHES TO REMAIN. REMOVE ONLY THOSE ITEMS AND MATERIALS NECESSARY TO ACCOMMODATE THE WORK WITH CLEAN, UNIFORM CUTS. FILL AND PATCH REMAINING CONSTRUCTION AS REQUIRED WITH MATERIALS MATCHING THE ADJACENT MATERIALS IN KIND, STRENGTH, AND APPEARANCE SO AS TO FINISH UNIFORMLY WITHOUT TELEGRAPHING DIFFERENCES BETWEEN THE PATCHES AND THE ADJACENT CONSTRUCTION. REPAIR OR REPLACE ANY ITEMS, MATERIALS OR FINISHES DAMAGED BY THE WORK AT NO COST TO THE OWNER.

4. PROVIDE THE ITEMS, PRODUCTS AND FEATURES AS DEPICTED, DESCRIBED AND SPECIFIED ON THE DRAWINGS. IF DISCREPANCIES ARE DISCOVERED ON THE DRAWINGS, NOTIFY THE ARCHITECT BY RFI AND DO NOT PROCEED WITH WORK RELATED TO ITEMS IN QUESTION UNTIL RECEIPT OF SUPPLEMENTAL INSTRUCTIONS FROM THE ARCHITECT. REQUESTS FOR SUBSTITUTIONS MAY BE SUBMITTED TO THE ARCHITECT FOR CONSIDERATION. DO NOT MAKE SUBSTITUTIONS WITHOUT THE APPROVAL OF THE ARCHITECT. WHERE A "BASIS-OF-DESIGN" PRODUCT IS SPECIFIED, A COMPARABLE PRODUCT MAY BE PROVIDED, SUBJECT TO COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

5. SUBMIT SHOP DRAWINGS, PRODUCT DATA AND SAMPLES TO THE ARCHITECT AND BCA FOR REVIEW AS REQUIRED BY THE CONTRACT DOCUMENTS. DO NOT PROCEED WITH WORK RELATED TO SUBMITTALS MARKED "REJECTED" OR "REVISE AND RESUBMIT" BY THE ARCHITECT OR THE ARCHITECT'S CONSULTANTS. SUBMITTALS MARKED "APPROVED", "NO EXCEPTION TAKEN" OR "MAKE CORRECTIONS NOTED" DO NOT SUPERSEDE THE NEED TO COMPLY WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

6. DO NOT SCALE DRAWINGS. THE DIMENSIONS ON THE DRAWINGS GOVERN. WRITTEN NOTES REFERENCING AN ITEM OR FEATURE WITH THE WORD "TYPICAL" (TYP) APPLY TO ALL IDENTICAL ITEMS OR FEATURES INDICATED ELSEWHERE ON THESE DRAWINGS.

7. PROVIDE A FLORIDA PRODUCT APPROVAL ISSUED BY THE FLORIDA DEPARTMENT OF BUSINESS & PROFESSIONAL REGULATION OR A MIAMI-DADE NOTICE OF ACCEPTANCE (NOA) ISSUED BY THE MIAMI-DADE COUNTY GOVERNMENT FOR EACH EXTERIOR COMPONENT AND CLADDING ASSEMBLY CERTIFYING THAT APPROVED TESTING HAS SUFFICIENTLY DEMONSTRATED THAT THE ASSEMBLY AND IT'S COMPONENTS, AS DESIGNED AND MANUFACTURED, WILL WITHSTAND THE WIND LOADS AND WIND-BORNE MISSILE IMPACTS IN COMPLIANCE WITH ALL CODE AND JURISDICTIONAL REQUIREMENTS FOR THE PROJECT LOCATION WHEN INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS INCLUDING INSTRUCTIONS THAT MAY BE PROVIDED WITH THE FLORIDA PRODUCT APPROVAL OR NOA DOCUMENTS. PROVIDE THESE DOCUMENTS AS PART OF THE SUBMITTAL FOR EACH OF THESE ITEMS AND ASSEMBLIES FOR BCA APPROVAL.

8. PROVIDE ALL ITEMS AND FEATURES DEPICTED AND DESCRIBED ON THESE DRAWINGS AND OTHER CONTRACT DOCUMENTS SO THEY ARE PROPERLY PLACED, ALIGNED, PLUMB, SECURED, FINISHED AND FUNCTIONING AS INTENDED. PROVIDE FINISHED WORK THAT MEETS OR EXCEEDS CURRENT INDUSTRY STANDARDS FOR QUALITY AND PERFORMANCE. ARRANGE AND CONDUCT INSPECTIONS OF THE FINISHED WORK WITH THE OWNER, THE ARCHITECT, AND THE AUTHORITY HAVING JURISDICTION. APPROVAL OF THE WORK BY THESE OR ANY OTHER PARTY OR AGENCY DOES NOT SUPERSEDE THE NEED TO COMPLY WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

9. REMOVE CONSTRUCTION DEBRIS, INCLUDING DEMOLISHED MATERIALS, FROM THE SITE AS REQUIRED TO PREVENT ACCUMULATION. TRANSPORT THESE MATERIALS OFF THE SITE IN A MANNER THAT WILL PREVENT SPILLAGE AND LEGALLY DISPOSE OF THESE MATERIALS AT AN EPA APPROVED DISPOSAL OR RECYCLING FACILITY.

10. KEEP COMPLETE AND LEGIBLE SETS OF CONSTRUCTION DOCUMENTS, ADDENDA, SUPPLEMENTAL INSTRUCTIONS, SUPPLEMENTAL DRAWINGS, MEETING NOTES, ETC. TOGETHER AND READILY AVAILABLE IN AN APPROPRIATE LOCATION ON SITE.

11. CONCEAL CONDUIT, PIPING, ETC. WITHOUT EXCEPTION. PROVIDE ACCESSIBLE JUNCTION BOXES, VALVES, CLEANOUTS, ETC., AS REQUIRED BY CODE.

12. WHERE POSSIBLE AND BEST PRACTICE, ALIGN THE SEAMS AND EDGES OF BREAK METAL AND FLASHING WITH ADJACENT REVEALS, EDGES OF MATERIAL TRANSITIONS, OR WITH BUILDING DESIGN FEATURES. CONSULT WITH ARCHITECT AS REQUIRED.

13. PER OWNER - CONTRACTOR AGREEMENT, PROJECT TO FOLLOW ALL OSHA STANDARDS AND REQUIREMENTS. INCLUDE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) EXCAVATION SAFETY STANDARD 29 C.P.R., SECTION 1926 630 SUBPART P, WHICH ARE INCORPORATED AS THE STATE STANDARD

14. ALL CONTRACTORS SHALL INCLUDE IN THEIR BID REFERENCE TO THE TRENCH SAFETY STANDARD, WHERE RELEVANT, AND WRITTEN ASSURANCE THAT THE CONTRACTOR WILL COMPLY WITH CHAPTER 553, PART V TRENCH SAFETY ACT, SECTIONS 553.60 THROUGH 553.64, FLORIDA STATUTES. ALL TRENCH SAFETY SYSTEMS SHALL BE DESIGNED BY THE CONTRACTOR.

15. NEW HOLES IN FLOOR SLAB DUE TO REMOVAL OF FLOOR OUTLETS, CONDUIT OR PIPE SHALL BE FILLED FLUSH WITH FLOOR WITH 3000 PSI CONCRETE AND KEYED TO SLAB WITH STEEL DOWELS. BONDING AGENT SHALL BE APPLIED TO SIDES OF HOLE BEFORE PLACEMENT OF CONCRETE.

16. AT STOREFRONT GLASS OR ANY GLASS WALL, FURNISH AND INSTALL DIAGONAL BRACING ABOVE IN CONCEALED LOCATION (IF EXPOSED, CONFIRM LOCATION SIDE WITH ARCHITECT).

17. REQUESTS FOR SUBSTITUTIONS OF SPECIFIED ITEMS SHALL BE SUBMITTED IN WRITING WITHIN BID PROPOSAL FOR CONSTRUCTION TO THE ARCHITECT, AND WILL BE CONSIDERED ONLY IF THEY PROVIDE BETTER SERVICES, HAVE A MORE ADVANTAGEOUS DELIVERY DATE, OR HAVE A LOWER PRICE PROVIDING A CREDIT TO THE TENANT AND WILL NOT SACRIFICE QUALITY, APPEARANCE OR FUNCTION. UNDER NO CIRCUMSTANCES WILL THE ARCHITECT BE REQUIRED TO PROVE THAT A PRODUCT PROPOSED FOR SUBSTITUTION IS OR IS NOT OF EQUAL QUALITY TO THE SPECIFIED PRODUCT.

18. SHOP DRAWINGS/SUBMITTALS ARE REQUIRED FOR BUT NOT LIMITED TO THE FOLLOWING: MILLWORK, STRUCTURAL/MISCELLANEOUS STEEL, HARDWARE, WOOD AND METAL DOORS, AND EQUIPMENT. SHOP DRAWINGS SHOULD INCLUDE DETAILED FABRICATION AND ERECTION DRAWINGS, SETTING DRAWINGS, AND MATERIAL SCHEDULES. FABRICATION SHALL BEGIN ONLY AFTER ARCHITECT'S REVIEW AND APPROVAL OF SHOP DRAWINGS.

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AR9244
©Wannemacher Jensen Architects, Inc.

PRELIMINARY NOT FOR CONSTRUCTION

LONG CENTER NATATORIUM
001
CITY OF CLEARWATER
1501 N BELCHER RD. CLEARWATER FL, 33765

Project number
0000

DISTRIBUTION

MILESTONE	DATE
SCHEMATIC BID SET	10.23.23

DRAWING LEGEND AND BUILDING DATA

G-101

DRAWING INDEX

SHEET #	SHEET NAME	SD BID PACKAGE
01 GENERAL		
G-100	COVER_OPT 1	●
G-101	DRAWING LEGEND AND BUILDING DATA	●
G-103	SHEET INDEX_OPT 1	
06 DEMO		
AD-301	DEMO FLOOR PLAN	●
AD-302	DEMO ROOF PLAN	●
AD-303	DEMO EXTERIOR ELEVATIONS	●
AD-304	DEMO EXTERIOR ELEVATIONS	●
07 ARCHITECTURAL		
A-002	3D VIEWS_OPT 1	●
A-003	RENDERINGS OPT_1	●
A-101	LEVEL 1 - FLOOR PLAN_OPT 1	●
A-102	ROOF PLAN_OPT 1	●
A-201	REFLECTED CEILING PLAN	●
A-303	EXTERIOR ELEVATIONS_OPT 1	●
A-304	EXTERIOR ELEVATIONS_OPT 1	●
A-410	EXTERIOR TRUSS PLANS, ELEVATIONS & SECTION_OPT 1	●
A-412	VENTILATION TOWERS_OPT 1	●
A-413	WALL SECTIONS_OPT 1	●
A-501	COVER_OPT 2	●
A-502	3D VIEWS_OPT 2	●
A-503	RENDERINGS OPT_2	●
A-504	LEVEL 1 - FLOOR PLAN_OPT 2	●
A-505	ROOF PLAN_OPT 2	●
A-506	EXTERIOR ELEVATIONS_OPT 2	●
A-507	EXTERIOR ELEVATIONS_OPT 2	●
A-508	EXTERIOR TRUSS PLANS, ELEVATIONS & SECTION_OPT 2	●
A-509	VENTILATION TOWERS_OPT 2	●
A-510	WALL SECTIONS_OPT 2	●

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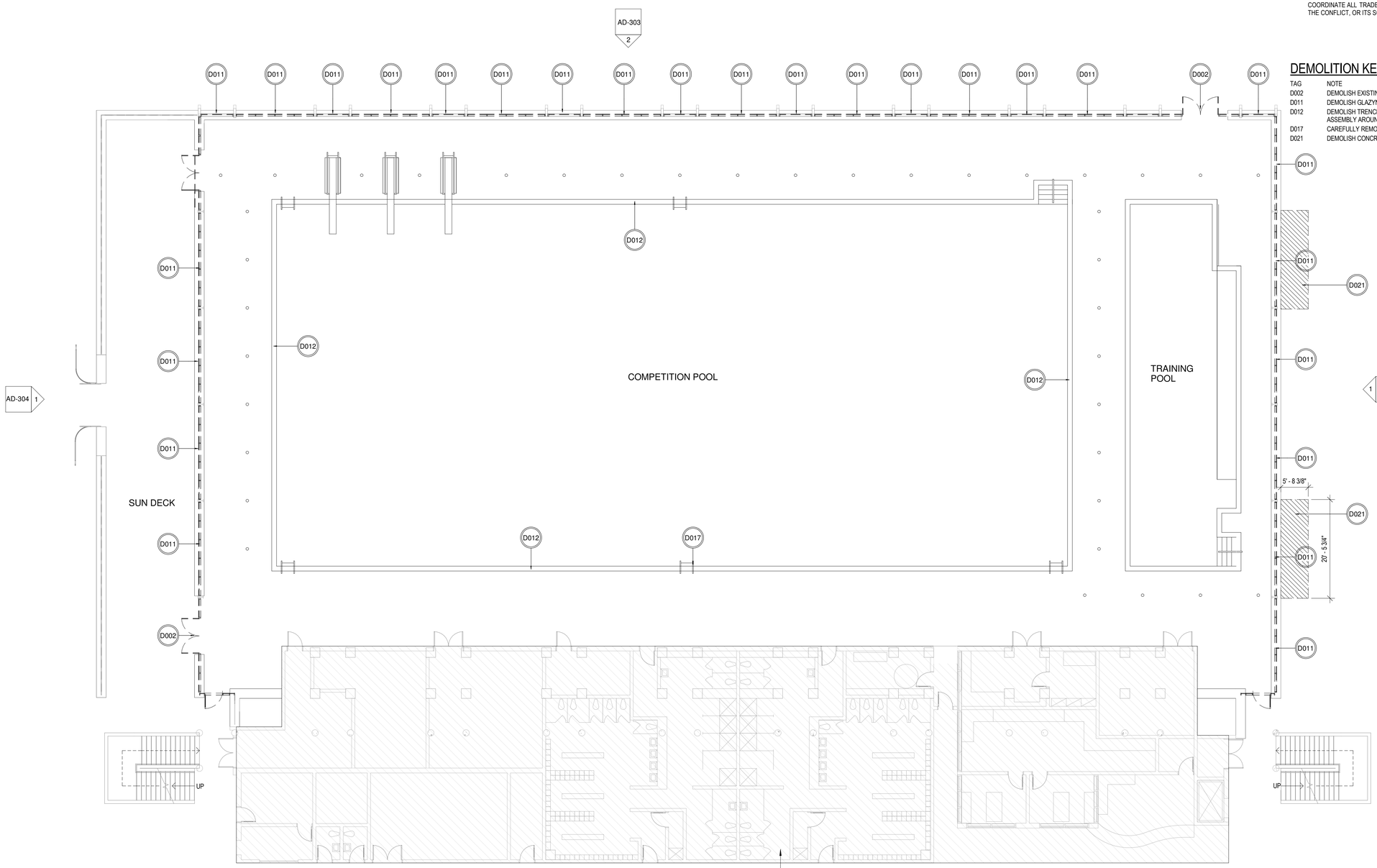
SHEET INDEX_OPT 1

G-103

GENERAL NOTES - DEMOLITION

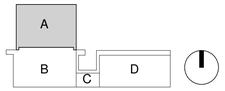
1. ALL DIMENSIONS AND CONDITIONS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO WORK, NOTIFY ARCHITECT IF CONFLICTS ARE FOUND
2. PROTECT ALL AREAS TO REMAIN. G.C. TO REPAIR OR REPLACE ANY ITEM TO REMAIN OR TO BE RELOCATED THAT IS DAMAGED DURING THE WORK. PROVIDE A SEAMLESS, UNDAMAGED APPEARANCE WHEN JOINING NEW TO EXISTING
3. REMOVE DASHED PORTION OF EXISTING WALLS, DOORS, WINDOWS, SIDELIGHTS, TRANSOMS, AND FRAMES. PREPARE AREA TO RECEIVE NEW CONSTRUCTION AS SCHEDULED.
4. FINISHES - ALL EXISTING FINISHES SHALL REMAIN, UNLESS SCHEDULED FOR NEW. CONTINUE EXISTING FINISHES TO REMAIN INTO NEW EXTENDED AREAS THAT ARE ADJACENT. PATCH & REPAIR EXISTING TO MATCH NEW. PREPARE SUBSTRATES TO RECEIVE NEW FINISHES WHERE SCHEDULED. FINISH ALL PATCHED OR EXTENDED WALLS TO NEAREST CHANGE OF DIRECTION, WALL TERMINATION, OR INTERSECTION. PHASING - COORDINATE EQUIPMENT DELIVERIES AND INSTALLATION WITH THE PHASING PLAN FOR APPROPRIATE SCHEDULING.
5. CONFLICTS - ANY CONFLICT FOUND WITH EXISTING CONDITIONS AND REQUIREMENTS FOR NEW CONSTRUCTION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT. IF THE CONFLICT AFFECTS THE PROGRESS OF THE WORK, VERIFY WITH ARCHITECT SOLUTION NECESSARY PRIOR TO PROCEEDING WITH THAT PORTION OF THE WORK AND IN A TIMELY FASHION SO AS NOT TO DELAY THE WORK. COORDINATE ALL TRADES TO ASCERTAIN NO FURTHER WORK WILL BE IMPACTED BY THE CONFLICT, OR ITS SOLUTION.



1 DEMOLITION FLOOR PLAN
3/32" = 1'-0"

DEMOLITION KEY NOTES

TAG	NOTE
D002	DEMOLISH EXISTING DOOR & FRAME ENTIRELY.
D011	DEMOLISH GLAZYNG SYSTEM ENTIRELY, STEEL STRUCTURE TO REMAIN.
D012	DEMOLISH TRENCH DRAIN AND POOL EDGE TO ACCOMODATE FOR NEW DRAIN ASSEMBLY AROUND COMPETITION POOL
D017	CAREFULLY REMOVE POOL ACCESSORIES AS REQUIRED TO DEMOLISH POOL EDGE.
D021	DEMOLISH CONCRETE SLAB IN PREPARATION FOR NEW FOUNDATION SYSTEM.



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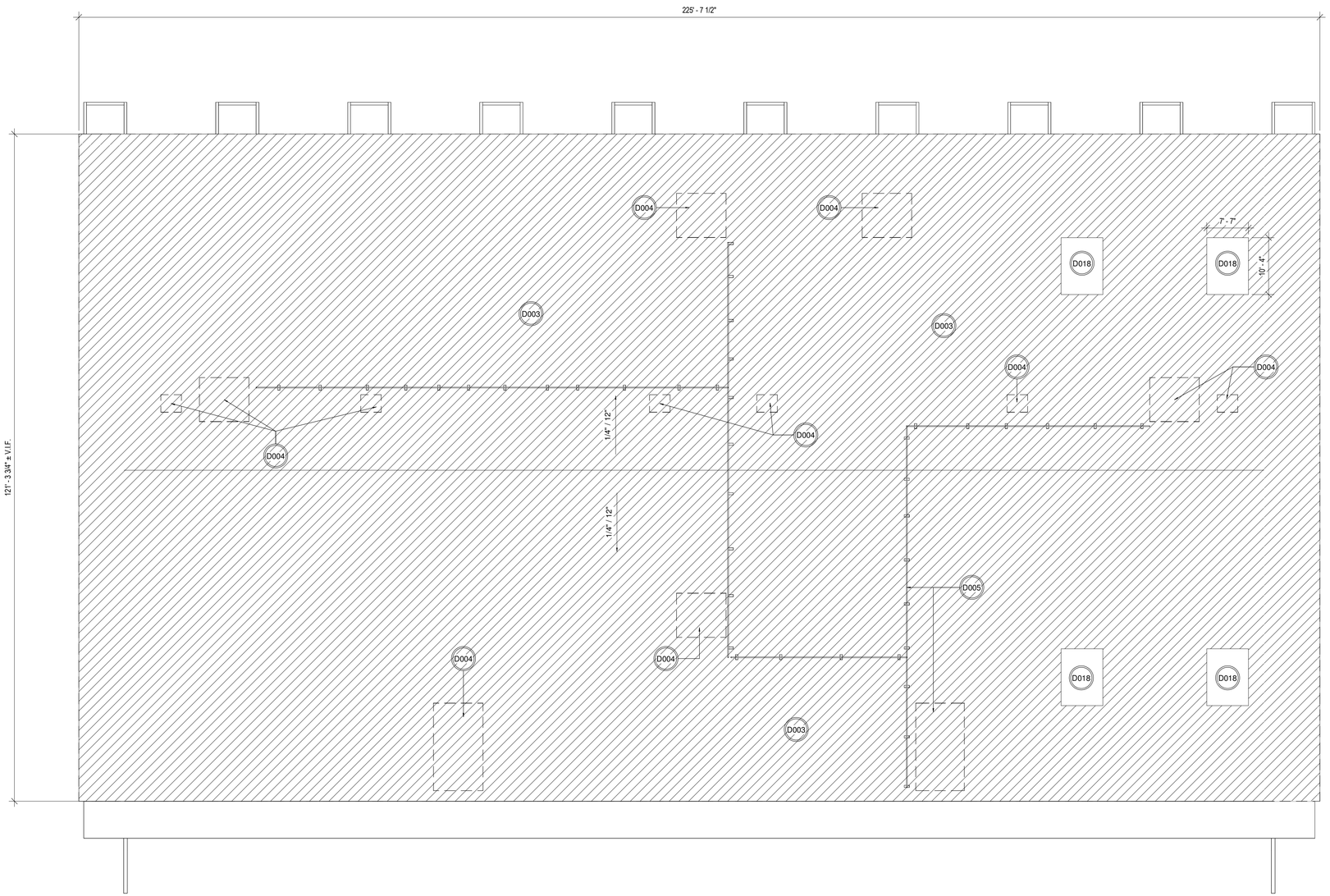
DEMO FLOOR PLAN

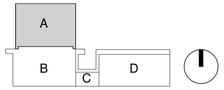
AD-301

DEMOLITION KEY NOTES

TAG	NOTE
D003	DEMOLISH ROOF SYSTEM DOWN TO DECK.
D004	DEMOLISH EXISTING ROOF CURB ENTIRELY.
D005	REFER TO MECHANICAL ENGINEERS' DWGS. FOR DEMOLITION OF MECHANICAL EQUIPMENT & COMPONENTS.
D018	EXISTING METAL DECK TO BE CUT OUT TO PROVIDE ACCESS FOR DUCTWORK.



1 DEMOLITION ROOF PLAN
3/32" = 1'-0"



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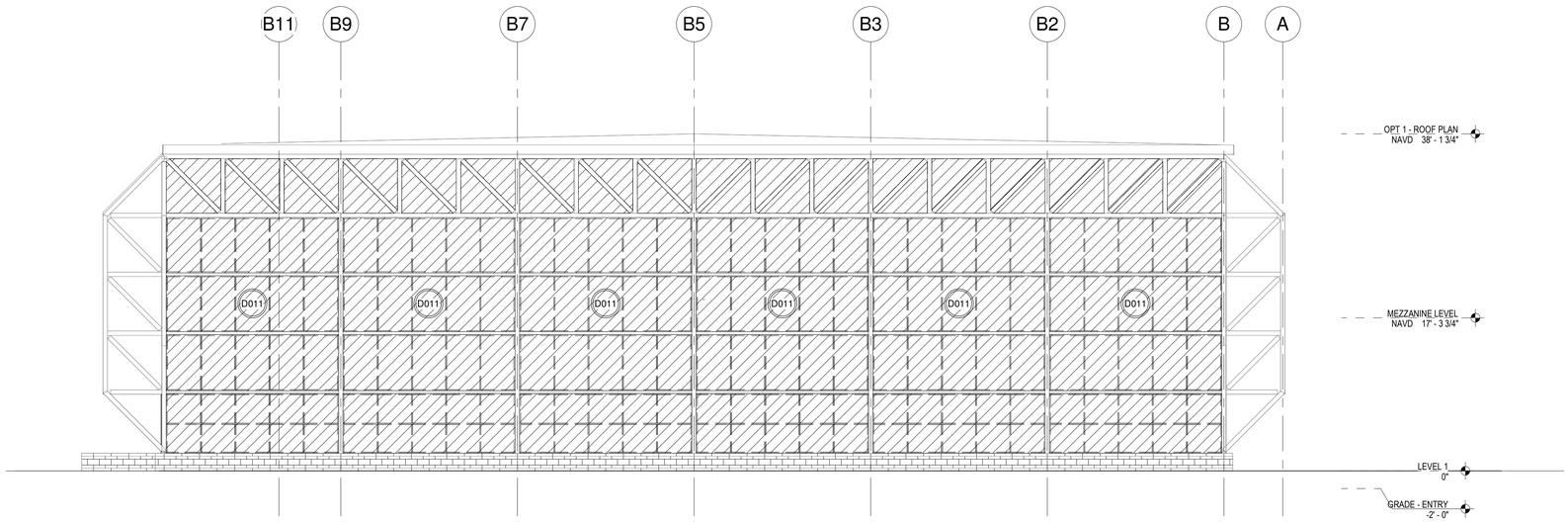
DEMO ROOF PLAN

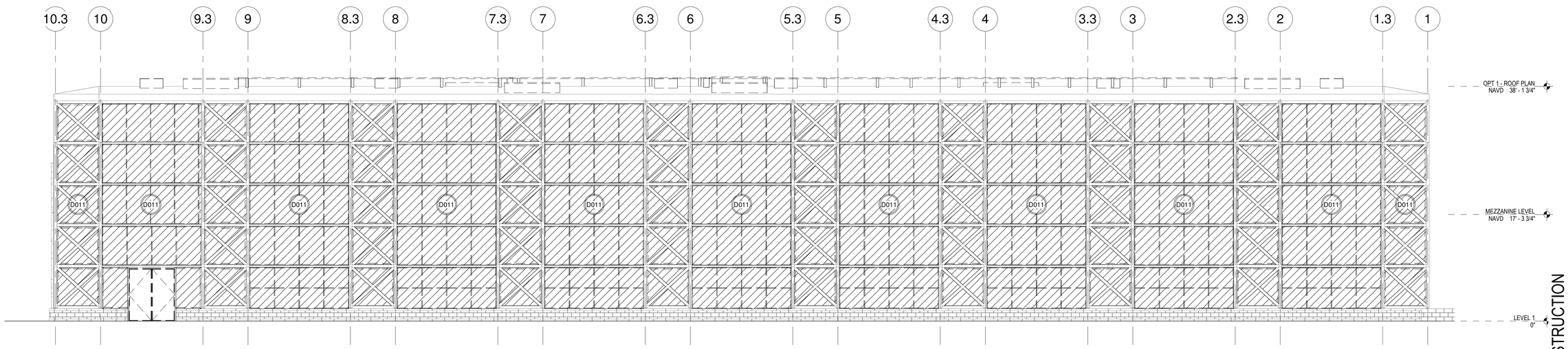
AD-302



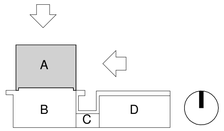
1 DEMOLITION ELEVATION - EAST
1/8" = 1'-0"

DEMOLITION KEY NOTES

TAG	NOTE
D011	DEMOLISH GLAZYNG SYSTEM ENTIRELY, STEEL STRUCTURE TO REMAIN.



2 DEMOLITION ELEVATION - NORTH
1/8" = 1'-0"



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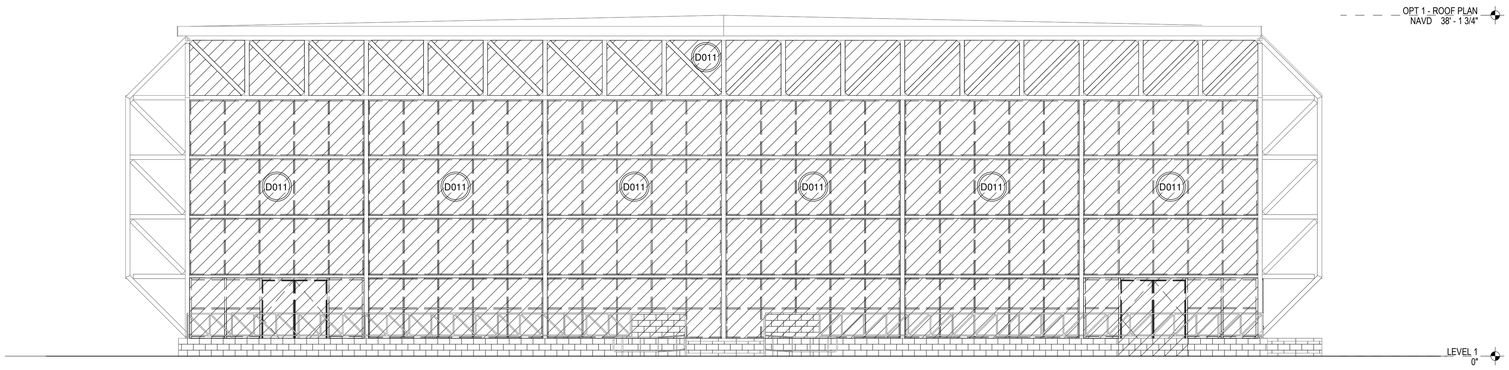
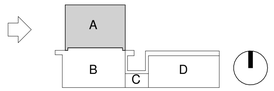
DEMO EXTERIOR ELEVATIONS

AD-303



1 DEMOLITION ELEVATION - WEST
1/8" = 1'-0"



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DEMO EXTERIOR ELEVATIONS

AD-304

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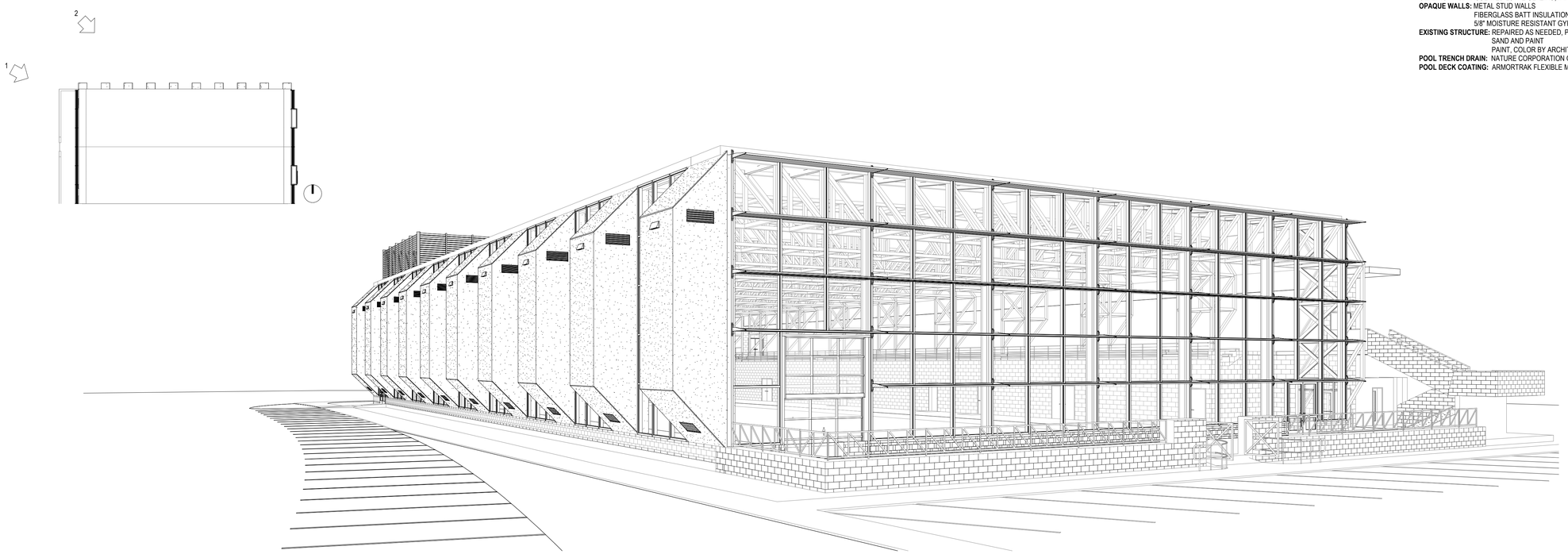
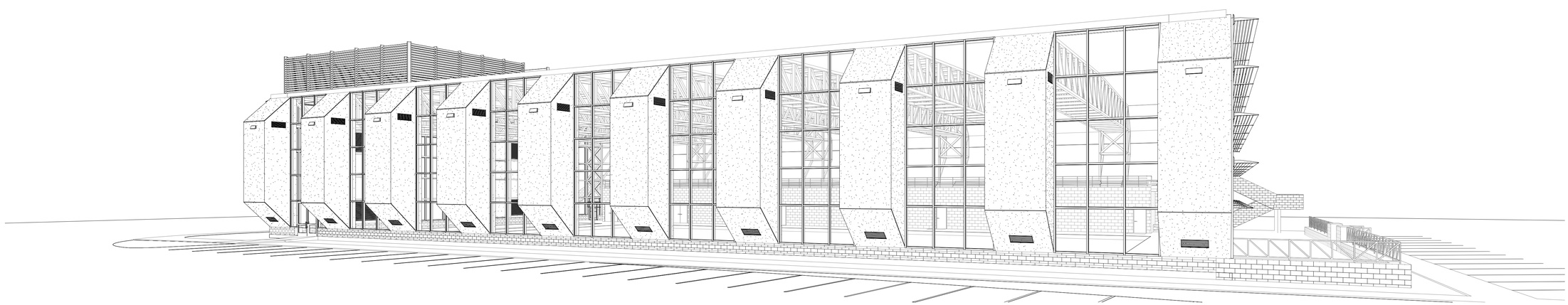
DESIGN CRITERIA

ROOF: 60 MIL TPO SINGLE PLY MEMBRANE
INSULATION: ROOF IS R-20 MIN POLYISO RIGID INSULATION
CURTAIN WALL: YKK - YHC 300 OG IMPACT RESISTANT SYSTEM
GLAZING: 1-1/4" INSULATED LOW E GLAZING, IMPACT RESISTANT
OPAQUE WALLS: METAL STUD WALLS
FIBERGLASS BATT INSULATION R-19 + 1" RIGID INSULATION
5/8" MOISTURE RESISTANT GYPSUM BOARD
EXISTING STRUCTURE: REPAIRED AS NEEDED, PER STRUCTURAL.
SAND AND PAINT
PAINT, COLOR BY ARCHITECT.
POOL TRENCH DRAIN: NATURE CORPORATION GMP GRATING
POOL DECK COATING: ARMORTRAK FLEXIBLE MILITARY GRADE URETHANE COATING



1 OPT - 1 3D VIEW -1



2 OPT - 1 3D VIEW -2

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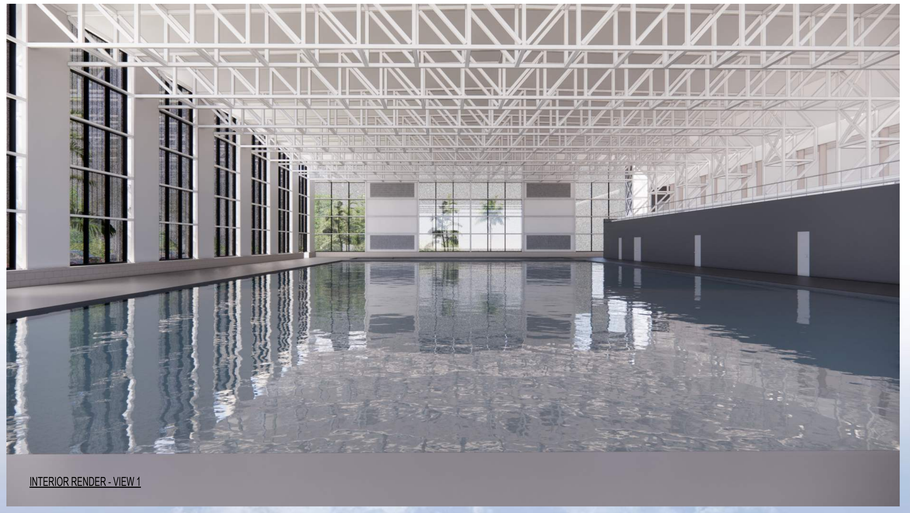
3D VIEWS_OPT 1

A-002

EXTERIOR RENDER - WEST - NORTH

EXTERIOR RENDER - EAST



INTERIOR RENDER - VIEW 1

INTERIOR RENDER - VIEW 2

EXTERIOR RENDER - NORTH

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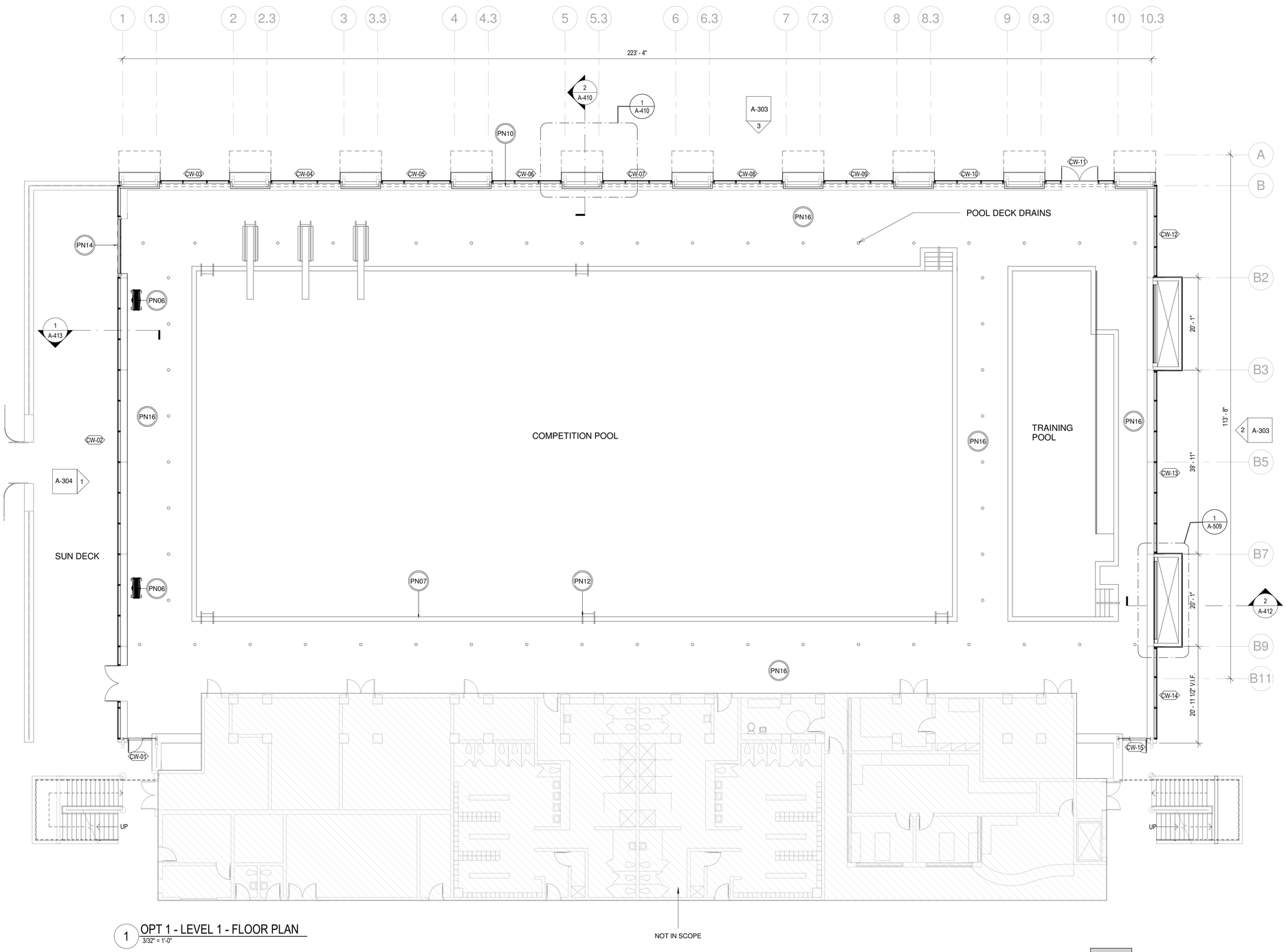
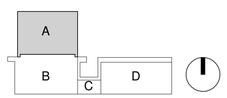
RENDERINGS OPT_1

A-003



1 OPT 1 - LEVEL 1 - FLOOR PLAN
3/32" = 1'-0"



GENERAL NOTES

1. HATCHED AREA NOT INCLUDED IN SCOPE OF WORK UNLESS OTHERWISE NOTED.
2. PROVIDE SUPPORT FOR WALL MOUNTED CABINETS AND PLUMBING FIXTURES. STEEL STUDS SUPPORTING WALL MOUNTED FIXTURES TO BE DOUBLED AT 16 O.C. OR NOT LESS THAN 20 GAUGE PER FBC 2517.5.1.1.
3. COMBUSTIBLE MATERIALS IN TYPES I & II CONSTRUCTION TO COMPLY WITH FBC 603.1 (FIRE RETARDANT - TREATED WOOD) AND 805.1 & 806.1
4. PROVIDE CEMENTITIOUS BACKER BOARD IN PLACE OF GWB AT ALL LOCATIONS SHOWING CERAMIC OR PORCELAIN TILE FINISH.
5. SEE SHEET ID100 - ID10X FOR FINISH PLANS.
6. SEE SHEET AX.X FOR PLAN DETAIL CALLOUTS.
7. SEE SHEET AX.X FOR PARTITION TYPE DETAILS. PROVIDE ACOUSTICAL BATT INSULATION WHERE INDICATED.
8. SEE SHEET AX.X FOR DIMENSION PLANS.
9. SEE SHEET AX.X FOR DOOR SCHEDULE.
10. SEE ENLARGED PLANS FOR ADDITIONAL WALL TAG INFORMATION.

TAG LEGEND

ELEMENT TAGS

Room name
101 — ROOM TAG
1001X — DOOR TAG
ST-X — STOREFRONT TAG
X 6 / X 6 — WALL TAG
XXX — SPECIALTY EQUIPMENT TAG
1t — FLOOR TAG

VIEW TAGS

Ref / 1 / A101 — EXTERIOR ELEVATION
1 Ref / Ref / A101 / Ref / 1 Ref — INTERIOR ELEVATION
1 / A101 / SIM — SECTION MARK
1 / A101 / SIM — VIEW CALLOUT
Name / Elevation — LEVEL HEAD
1'-0" / A.F.F — SPOT ELEVATION MARK

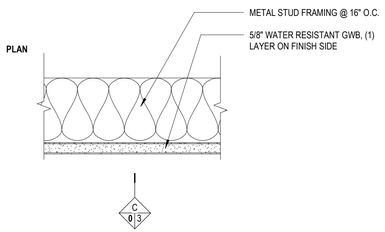
ANNOTATION TAGS

ALIGNMENT TAG — ALIGN
SPECIFIC NOTE TAG — XXX

SPECIFIC NOTES

TAG	NOTE
PN06	SIDEKICK BIG ASS FAN, PLUG-IN TYPE, PROPELLER STYLE ON WHEELS.
PN07	PROVIDE NEW POOL EDGE AND TRENCH DRAIN ASSEMBLY TO MATCH TRAINING POOL.
PN10	EXISTING BEAM ABOVE.
PN12	REMOVE AND REPLACE POOL ACCESSORIES TO REPLACE POOL EDGE.
PN14	CROWN SST-II HYDRAULIC BI-FOLD DOOR SYSTEM.
PN16	EPOXY DECK COATING THROUGHOUT POOL DECK.

PLAN



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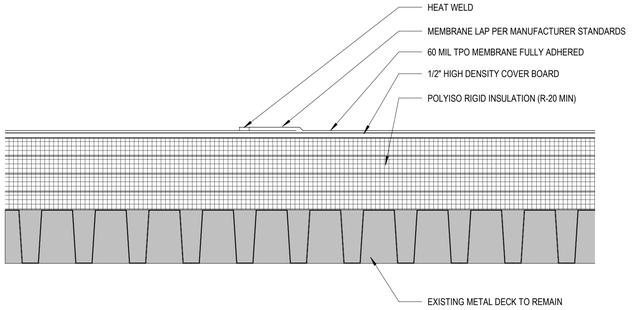
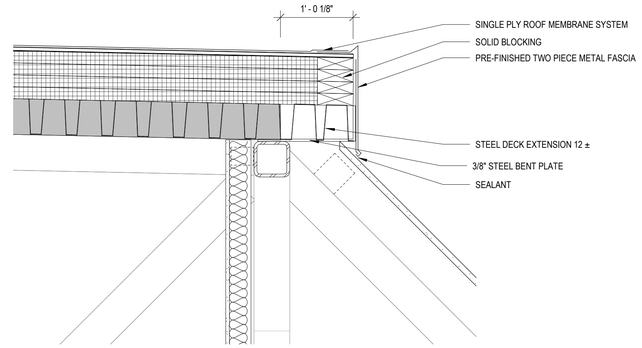
LEVEL 1 - FLOOR PLAN_OPT 1

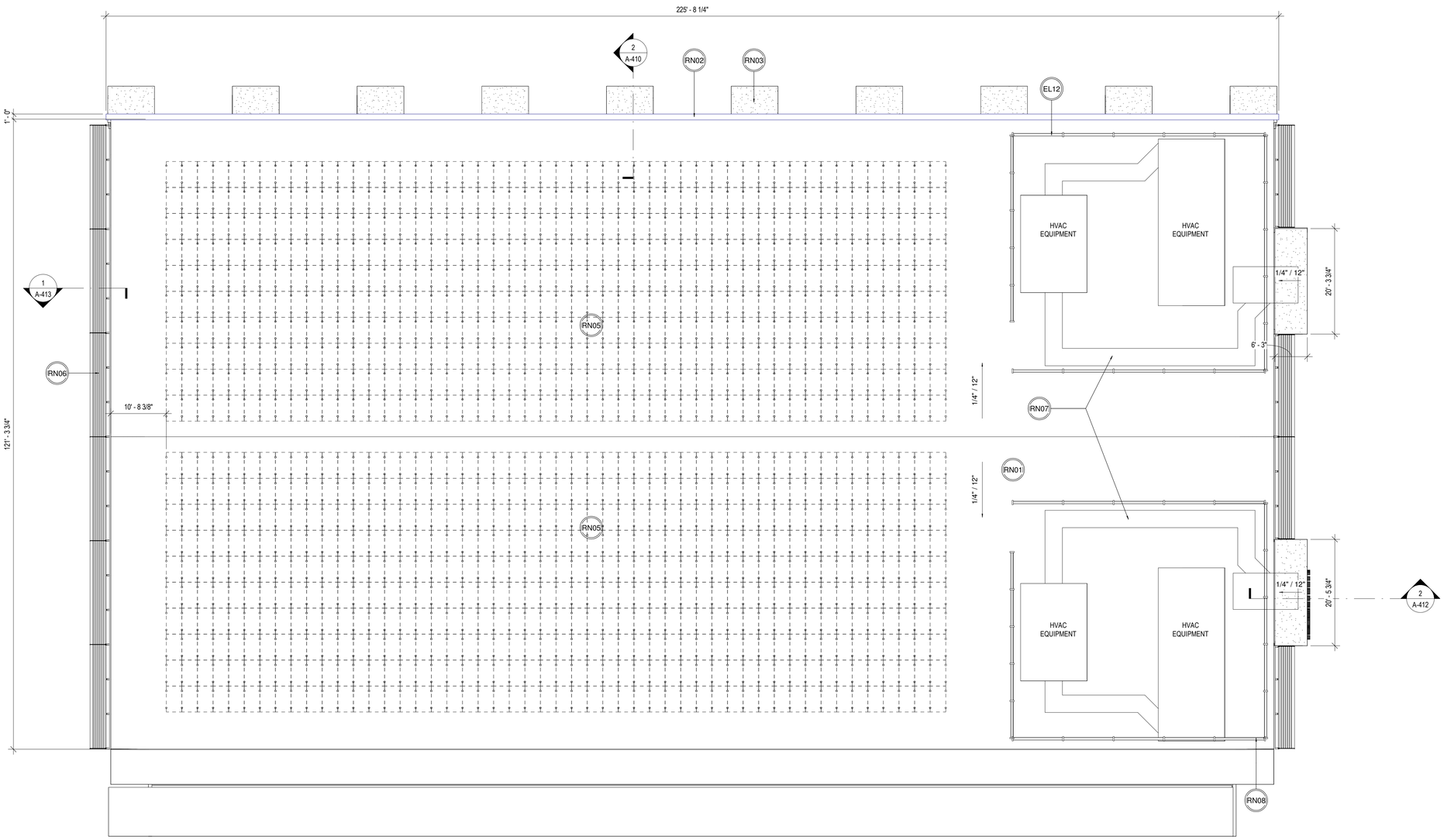
A-101



2 OPT 1 - DETAIL - TYPICAL TPO ROOF ASSEMBLY
1 1/2" = 1'-0"



3 OPT 1 - TYP. NORTH ROOF EDGE
1" = 1'-0"



1 OPT 1 - ROOF PLAN
3/32" = 1'-0"

GENERAL NOTES

1. ROOFING PRODUCT BASIS-OF-DESIGN: 60 MIL TPO SINGLE PLY MEMBRANE ROOF OR APPROVED EQUAL (COLOR WHITE) RIGID INSULATION BOARD MECHANICALLY FASTENED TO STEEL ROOF DECK. INSULATION TO HAVE AN AVERAGE R-20 @ ALL ROOFS OVER CONDITIONED SPACES. PROVIDE ROOFING COMPONENTS AND MATERIALS APPROVED BY THE ROOFING PRODUCT MANUFACTURER. ASSEMBLE ROOFING COMPONENTS INCLUDING FLASHING, ROOF DRAINS, ETC. PER THE ROOFING PRODUCT MANUFACTURER'S DETAILS AND INSTRUCTIONS SO AS TO QUALIFY FOR, AND RECEIVE A SPECIAL 20-YEAR WEATHER-TIGHTNESS WARRANTY FROM THE MANUFACTURER AS WELL AS A SPECIAL 2-YEAR PROJECT WARRANTY FROM THE ROOFING INSTALLER COVERING ALL COMPONENTS OF THE ROOFING SYSTEM SUCH AS ROOFING, BASE FLASHING, ROOF INSULATION, FASTENERS, COVER BOARDS, ETC. PROVIDE ROOFING FROM A QUALIFIED MANUFACTURER THAT IS FM GLOBAL APPROVED FOR ROOFING SYSTEM IDENTICAL TO THAT USED FOR THIS PROJECT.

2. PROVIDE METAL ROOF COPINGS AND PARAPET FASCIAS FABRICATED OF ASTM B209 0.050-INCH ALUMINUM SHEET. COMPLY WITH "THE NRCA ROOFING MANUAL" AND THE SMACNA "ARCHITECTURAL SHEET METAL MANUAL REQUIREMENTS FOR DIMENSIONS AND PROFILES SHOWN UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED. PROVIDE MANUFACTURER'S 20-YEAR FINISH WARRANTY. SECURE COPINGS TO PARAPETS WITH CONT ALUMINUM CLEATS.

3. PROVIDE GALVANIZED STEEL INTERNALLY REINFORCED ROOF-CURB UNITS CAPABLE OF SUPPORTING SUPERIMPOSED LIVE AND DEAD LOADS, INCLUDING EQUIPMENT LOADS, WITH WELDED OR MECHANICALLY FASTENED, NON-SAG SEALED JOINTS AND INTEGRALLY FORMED DECK-MOUNTING FLANGE AT PERIMETER BOTTOM. COORDINATE DIMENSIONS WITH ROUGHING-IN INFORMATION ON SHOP DRAWINGS OF EQUIPMENT TO BE SUPPORTED.

4. ROOF DRAIN BASIS-OF-DESIGN: Z125 8 3/8" DIAMETER ROOF DRAIN WITH LOW SILHOUETTE DOME MANUFACTURED BY ZURN INDUSTRIES.

5. GENERAL - IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO PROVIDE FOR A COMPLETE AND WEATHERTIGHT INSTALLATION OF ALL ROOF ITEMS, PENETRATIONS, ETC. THE CONTRACTOR SHALL PROVIDE ALL ROOF ACCESSORIES, FLASHING, SEALANT, SCUPPERS, DRAINS, LABOR, MATERIALS, EQUIPMENT, ETC. REQUIRED FOR COMPLETION OF A WEATHERTIGHT ROOF INSTALLATION. FOLLOW ALL RECOMMENDATIONS OF THE NRCA REGARDING INSTALLATION PROCEDURES, UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED

6. SLOPE - ROOF SURFACE SHALL HAVE A MINIMUM SLOPE OF 1/4" PER FOOT IN A PERPENDICULAR DIRECTION FROM THE ROOF EDGE DOWN TOWARD THE ROOF DRAINS AS INDICATED BY THE ARROWS DRAWN ON THE ROOF PLAN. WHERE REQUIRED TO FACILITATE DRAINAGE, PROVIDE VALLEYS, CRICKETS, RIDGES, ETC. OF REQUIRED SLOPE TO PROPERLY DRAIN ALL ROOF SURFACES.

7. ROOF DRAINS - COORDINATE LOCATION OF ALL ROOF DRAINS TO AVOID RATED WALLS, BEAMS, COLUMNS, JOISTS, ETC. BELOW.

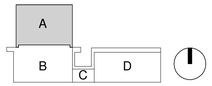
8. PENETRATIONS - PROPERLY FLASH, WATERPROOF, SECURE AND SEAL ALL ITEMS THAT PENETRATE THE ROOF MEMBRANE. DO NOT INSTALL ANY PITCH POCKETS. FOLLOW GUIDELINES OF NRCA CONCERNING FLASHING AND WATERPROOFING ALL ROOF PENETRATIONS. SEE ROOF DETAILS

9. ROOF EQUIPMENT - MOUNT ALL ROOF EQUIPMENT ON PREFABRICATED EQUIPMENT SUPPORT CURBS WITH INTEGRAL INSULATION. WHERE EQUIPMENT IS RAISED ABOVE ROOF SURFACE, ALIGN SUPPORTS PARALLEL TO DIRECTION OF WATERFLOW TO FACILITATE DRAINAGE. VERIFY ALL REQUIREMENTS WITH EQUIPMENT AND CURB MANUFACTURERS. WHERE ROOF MEMBRANE EXTENDS BENEATH EQUIPMENT, MOUNT EQUIPMENT ABOVE THE ROOF SURFACE IN ACCORDANCE WITH BUILDING CODE AND NRCA REQUIREMENTS TO ALLOW FOR INSTALLATION OF ALL REQUIRED ROOFING COMPONENTS AND TO ALLOW FOR FUTURE OWNER MAINTENANCE.

10. LIGHTNING PROTECTION - REFER TO ELECTRICAL DRAWINGS PROTECTION FOR ALL LIGHTNING PROTECTION. GROUNDING RODS, CABLES, CONNECTIONS, ETC. SHALL BE INSTALLED IN SUCH A MANNER TO PREVENT ANY DAMAGE TO INSTALLED ROOF MEMBRANE. GROUNDING RODS SHALL BE FASTENED TO THE SUBSTRATE ON WHICH THEY ARE MOUNTED. PROVIDE ALL REQUIRED FLASHING, SEALANT, WATERPROOFING, NON-CORROSIVE FASTENERS, ETC. AT EACH LOCATION AND AT MEMBRANE PENETRATION POINTS.

SPECIFIC NOTES

TAG	NOTE
EL12	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.
RN01	60 MIL SINGLE PLY TPO ROOF MEMBRANE.
RN02	12" ROOF EXTENSION, REFER TO SECTION DETAIL.
RN03	TOP OF TRUSS BELOW.
RN05	PHOTOVOLTAIC ARRAY.
RN06	ALUMINUM SUNSHADES BY CURTAIN WALL MANUFACTURER.
RN07	PROVIDE STEEL SUPPORT FRAMES FOR DUCT WORK @ 48" O.C.
RN08	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.



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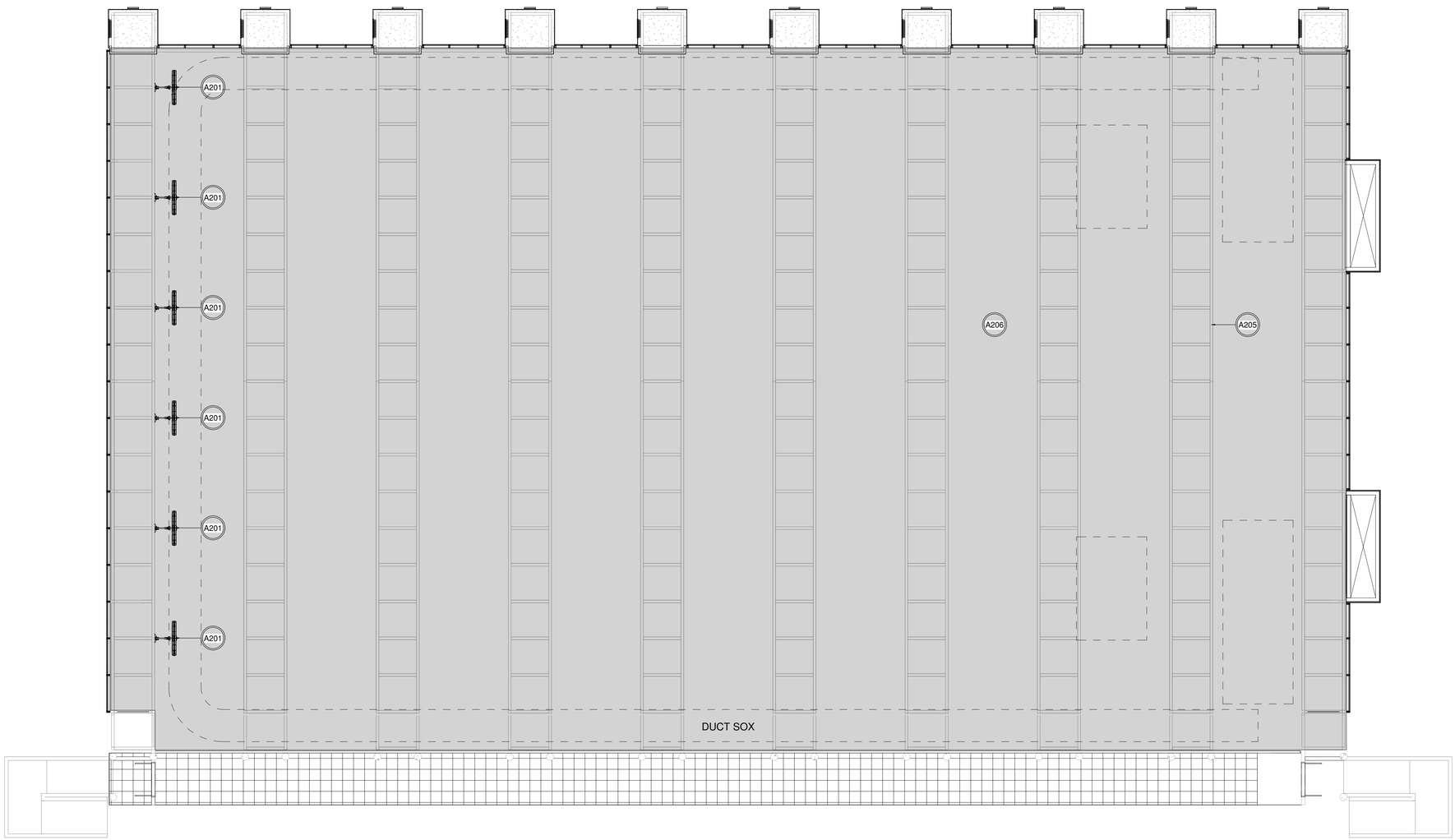
ROOF PLAN_OPT 1

A-102



1 LEVEL 1 - REFLECTED CEILING PLAN
3/32" = 1'-0"

GENERAL NOTES:

1. EXISTING STEEL STRUCTURE TO BE REPAIRED PER STRUCTURAL DRAWINGS.
2. EXISTING STEEL STRUCTURE TO BE SANDED AND PAINTED ENTIRELY.
3. EXISTING INTERIOR LIGHTING TO REMAIN.
4. LIGHTING SCOPE LIMITED TO EXTERIOR LIGHT FIXTURES MOUNTED TO FACE OF TRUSS FRAMES.
5. VERIFY LOCATIONS OF ALL LIGHT FIXTURES, AIR SLOTS, AIR SUPPLY AND RETURN GRILLES WITH PLANS AND COORDINATE INSTALLATION WITH MECHANICAL AND ELECTRICAL CONTRACTORS. NOTIFY ARCHITECT OF ANY CONFLICTS PRIOR TO INSTALLATION.
6. PAINT ALL MECHANICAL SLOTS, GRILLES, OR ACCESS PANELS TO MATCH SURFACE ON WHICH THEY OCCUR, UNLESS OTHERWISE NOTED.
7. CONTRACTOR IS TO PROVIDE ALL MISCELLANEOUS MTL STUD FRAMING REQUIRED FOR SOFFITS AND BULKHEADS AS GRAPHICALLY DEPICTED ON THE REFLECTED CEILING PLAN, SECTIONS AND ELEVATIONS.
8. PAINT ALL EXPOSED STEEL STRUCTURE AND ALL OTHER EXPOSED SURFACES THAT ARE NOT PREFINISHED OR INTEGRALLY COLORED EXCEPT IN CONCEALED SPACES INCLUDING MECHANICAL ROOMS, JANITOR CLOSETS, AND ELECTRICAL ROOMS.
9. PROVIDE CARE AND COORDINATION TO CONCEAL ALL CONDUIT, FIRE PROTECTION PIPING, AND PLUMBING
10. ALL LIGHTING IS DEPICTED TO INDICATE LOCATION ONLY, SEE ELECTRICAL FOR FIXTURE SPECIFICATIONS, NOTIFY ARCHITECT OF ANY DISCREPANCIES.
11. AT ALL EXPOSED METAL DECK LOCATIONS UTILIZE WEDGE BOLT/NET SYSTEM TO HANG ALL SYSTEMS.

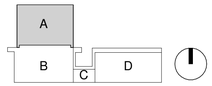
CEILING FIXTURE LEGEND

CEILING MATERIAL LEGEND

EXPOSED DECK TO BE REPAINTED, STRUCTURAL STEEL TO BE REPAIRED, SAND BLASTED AND PAINTED. SEE STRUCTURAL FOR REPAIRS

SPECIFIC NOTES

TAG	NOTE
A201	SIDEWALL MOUNTED BIG ASS FAN, ADJUSTABLE PIVOT FAN"
A205	SAND AND PAINT ALL EXISTING STEEL"
A206	EXISTING CEILING LIGHTING AND FIXTURES TO REMAIN. COVER AND PROTECT WHILE PERFORMING NEW WORK.



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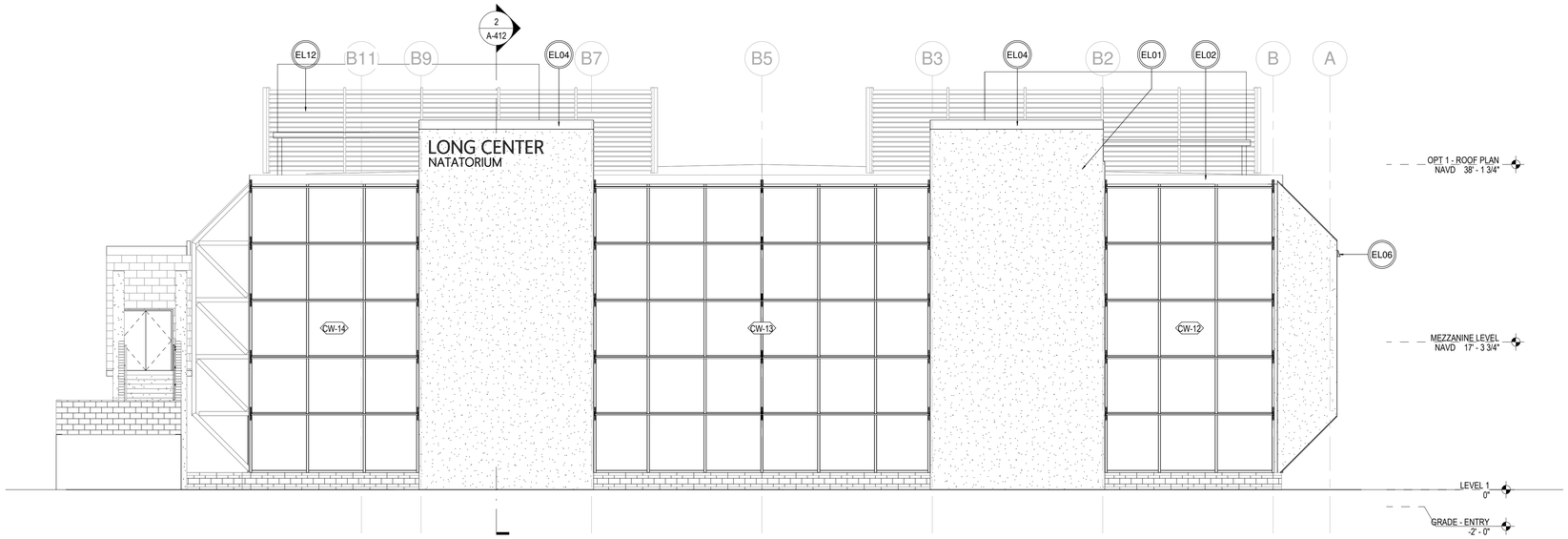
REFLECTED CEILING PLAN

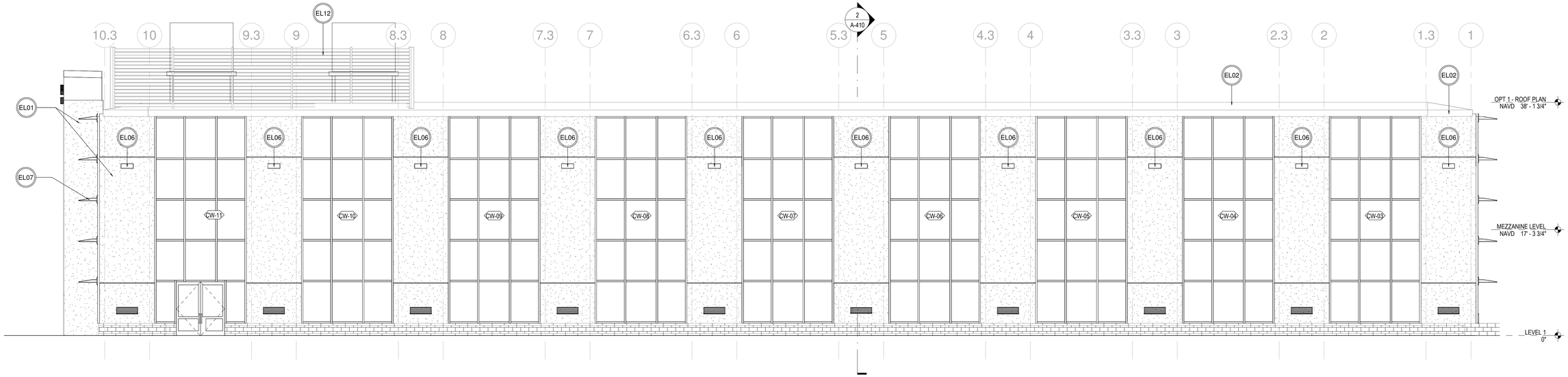
A-201



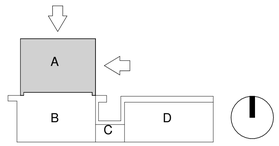
2 OPT 1 - EAST ELEVATION
1/8" = 1'-0"

SPECIFIC NOTES

TAG	NOTE
EL01	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL04	TWO PIECE ROOF EDGE FASCIA, PRE-FINISHED.
EL06	EXTERIOR LIGHT FIXTURE
EL07	ALUMINUM SUNSHADES BY CURTAIN WALL MANUFACTURER
EL12	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.



3 OPT 1 - NORTH ELEVATION
1/8" = 1'-0"



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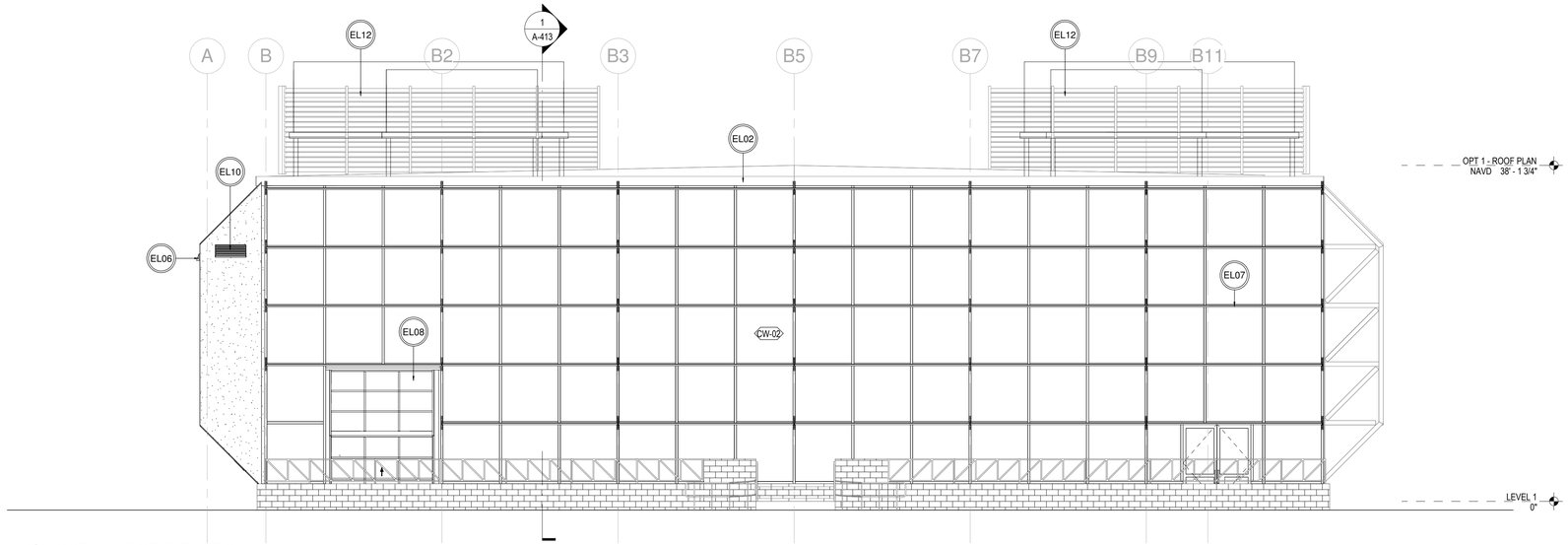
EXTERIOR ELEVATIONS_OPT 1

A-303

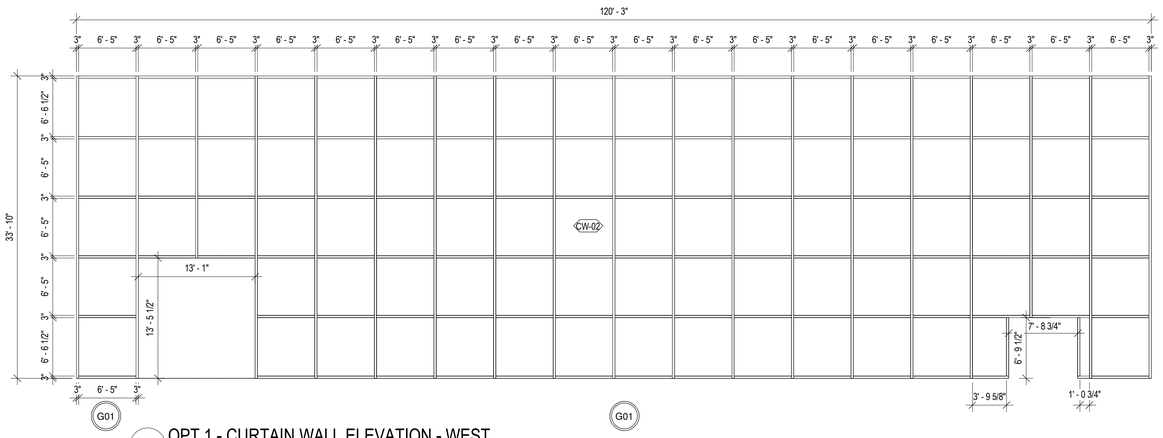


1 OPT 1 - WEST ELEVATION
1/8" = 1'-0"

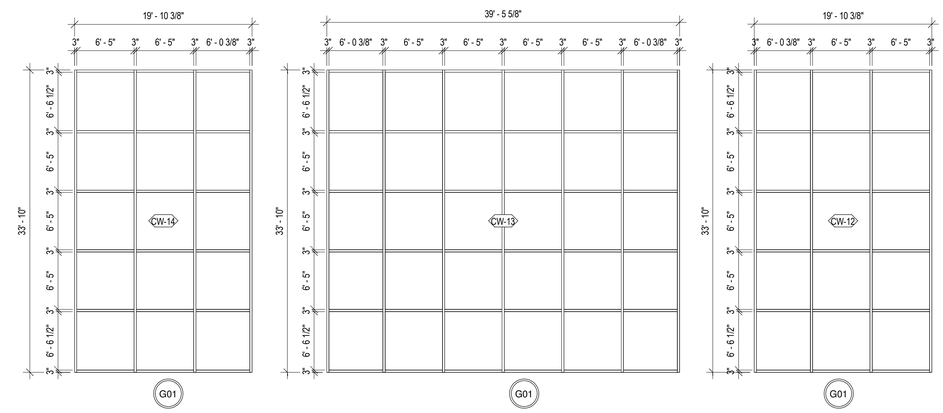
SPECIFIC KEYNOTES - ELEVATIONS	
NUMBER	TEXT

SPECIFIC NOTES

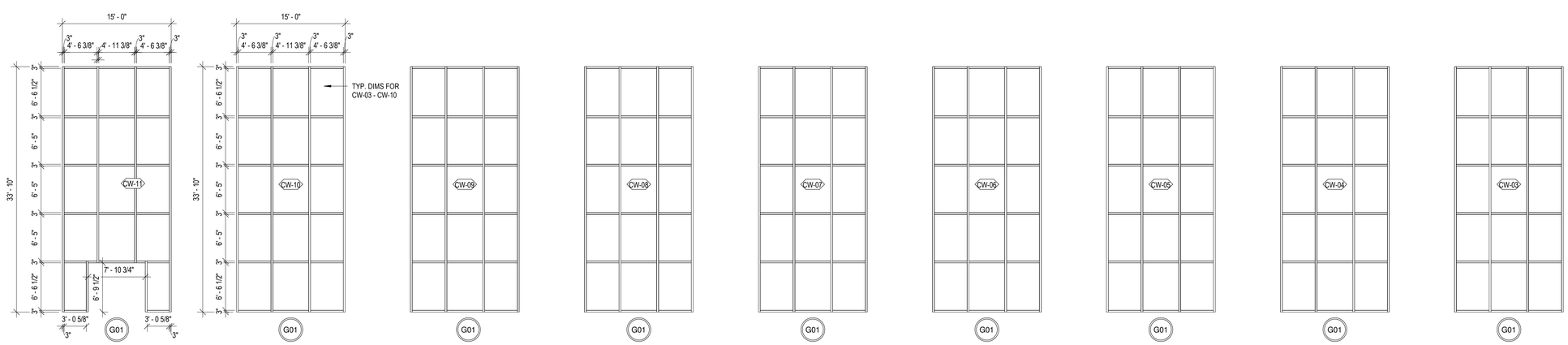
TAG	NOTE
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL06	EXTERIOR LIGHT FIXTURE
EL07	ALUMINUM SUNSHADES BY CURTAIN WALL MANUFACTURER
EL08	CROWN SST-II HYDRAULIC BI-FOLD DOOR SYSTEM.
EL10	VENTS FOR NATURAL VENTILATION.
EL12	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.
G01	1-1/4" INSULATED, IMPACT RESISTANT SAFETY GLAZING.



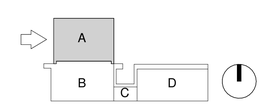
2 OPT 1 - CURTAIN WALL ELEVATION - WEST
1/8" = 1'-0"



3 OPT 1 - CURTAIN WALL ELEVATIONS - EAST
1/8" = 1'-0"



4 OPT 1 - CURTAIN WALL ELEVATIONS - NORTH
1/8" = 1'-0"



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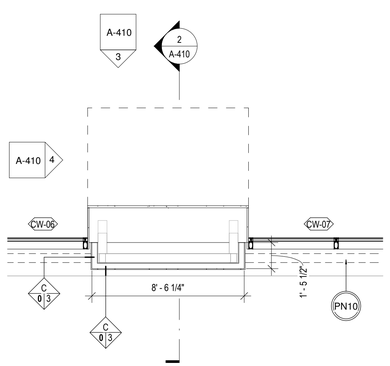
EXTERIOR ELEVATIONS_OPT 1

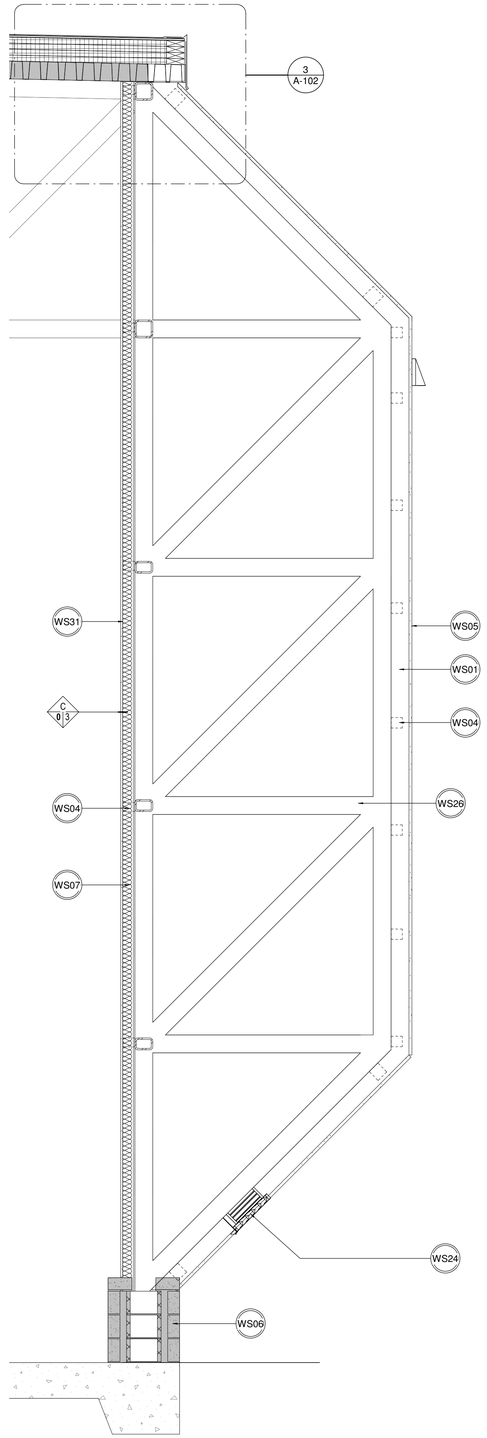
A-304

SPECIFIC NOTES

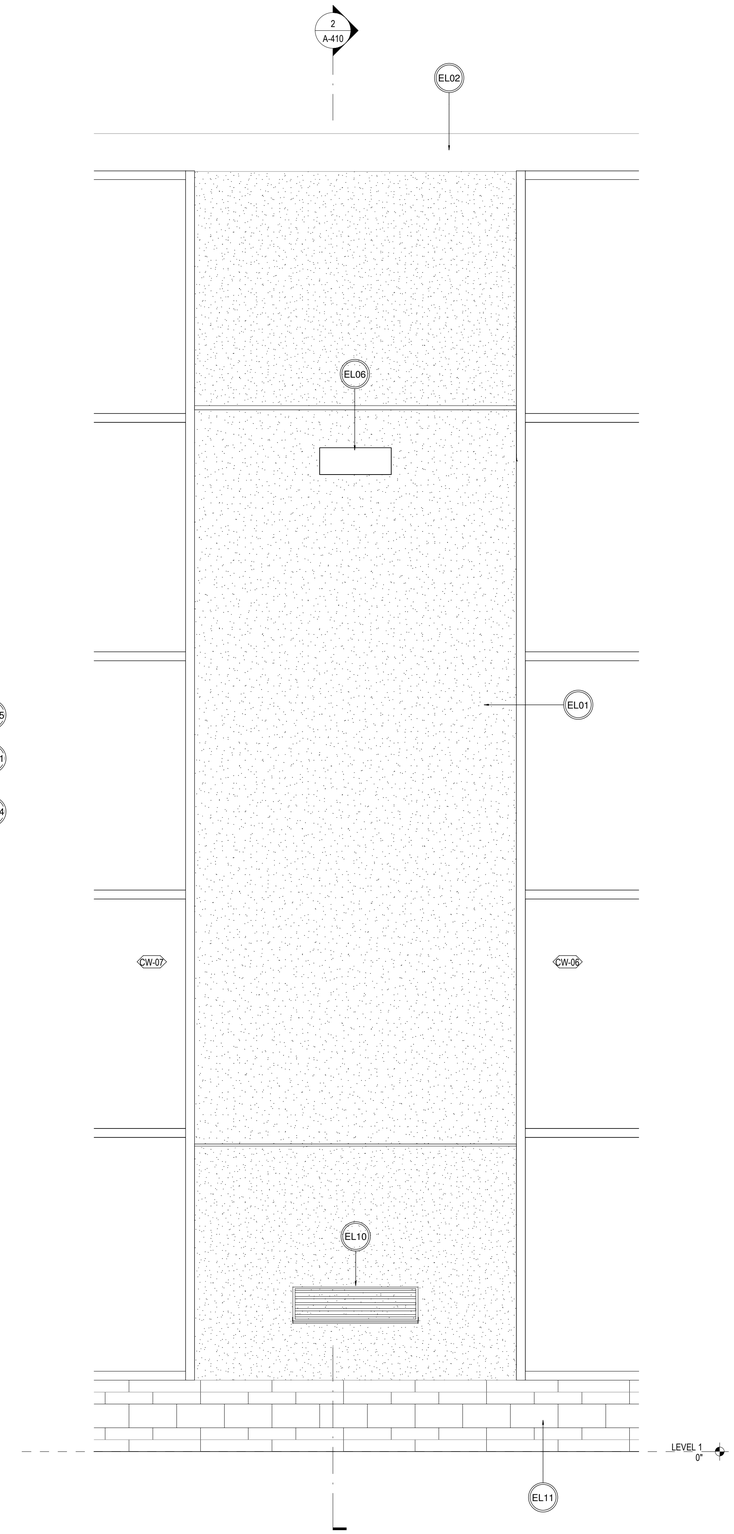
TAG	NOTE
EL01	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL06	EXTERIOR LIGHT FIXTURE
EL10	VENTS FOR NATURAL VENTILATION.
EL11	EXISTING MASONRY BASE TO BE CLEANED AND REPOINTED AS NEEDED.
PN10	EXISTING BEAM ABOVE.
WS01	3 5/8" METAL STUDS FASTENED TO EXISTING TRUSS FRAME @ 16" O.C..
WS04	FRAMING CLIP @ EVERY HORIZONTAL HSS MEMEBER OR 24" O.C. VERTICALLY.
WS05	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING, SAND FINISH - PTD.
WS06	EXISTING MASONRY WALL BASE TO REMAIN.
WS07	FILL CAVITY WITH R-19 INSULATION, TYP.
WS24	VENTS FOR NATURAL VENTILATION.
WS26	STEEL FRAME TRUSS TO BE SANDBLASTED & REPAINTED, TYP.
WS31	5/8" THK WATER RESISTANT GYPSUM BOARD.



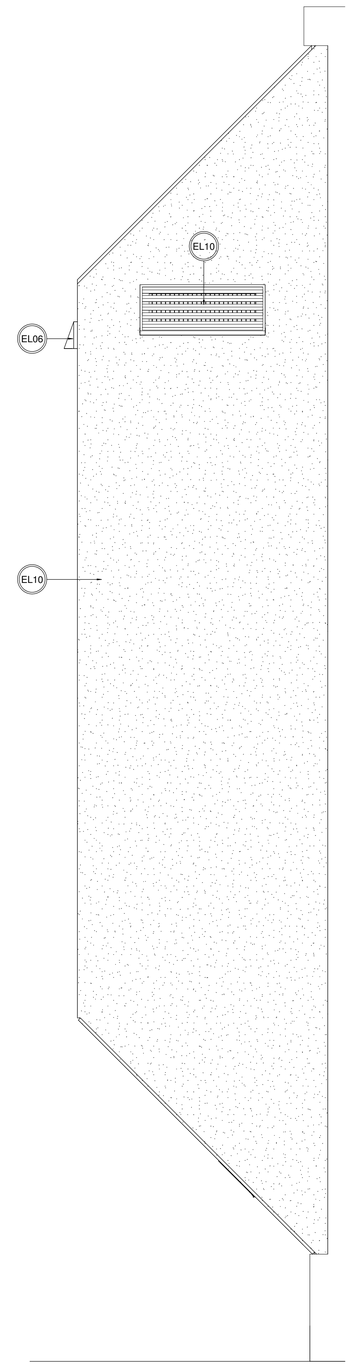
1 OPT 1 - ENLARGED PLAN @ TRUSS
1/4" = 1'-0"



2 OPT 1 - SECTION @ TRUSS FRAME
1/2" = 1'-0"



3 OPT 1 - TRUSS NORTH ELEVATION
1/2" = 1'-0"



4 OPT 1 - TRUSS SIDE ELEVATION
1/2" = 1'-0"

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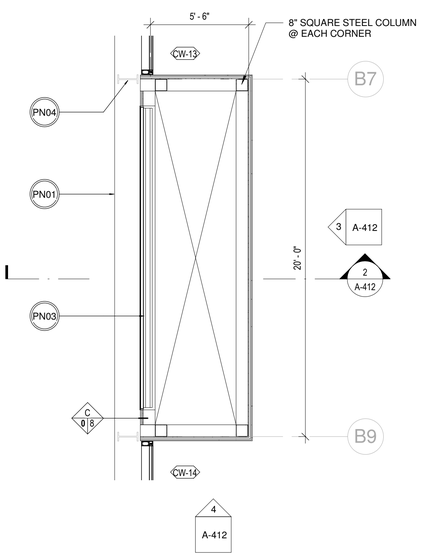
EXTERIOR TRUSS PLANS, ELEVATIONS & SECTION_OPT 1

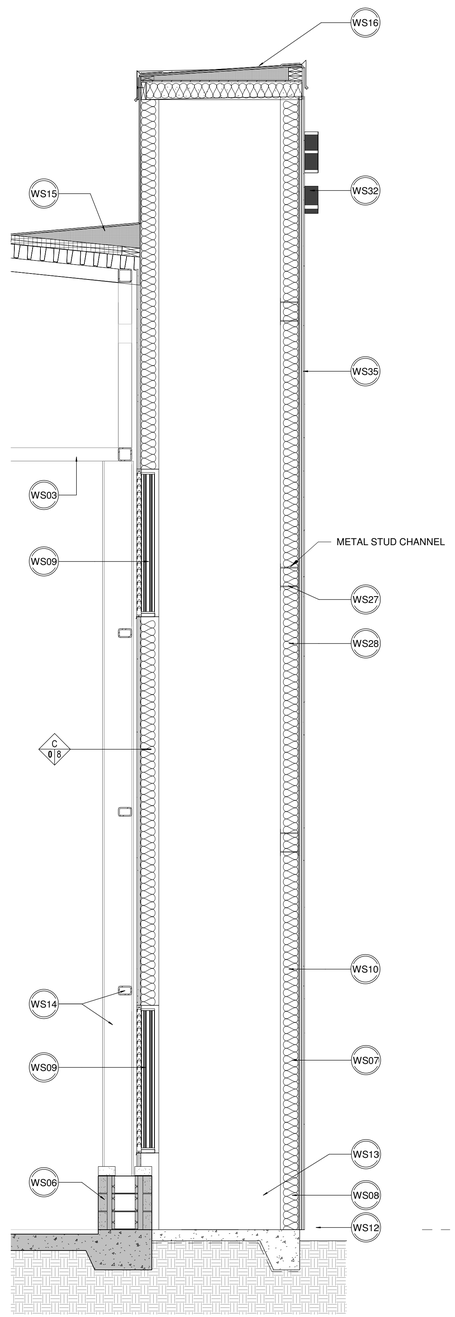
A-410

SPECIFIC NOTES

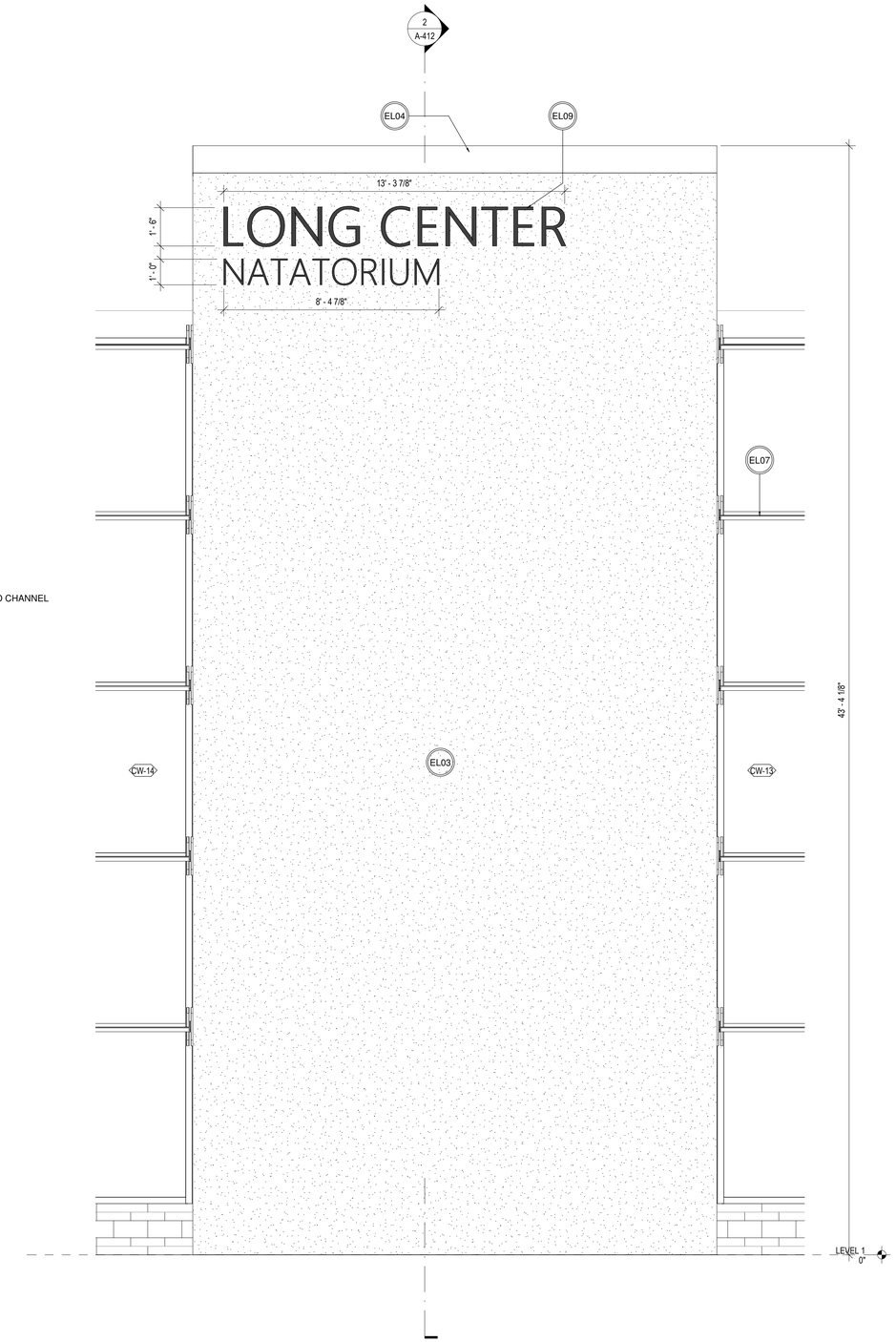
TAG	NOTE
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL03	FIBER CEMENT SIDING, PTD.
EL04	TWO PIECE ROOF EDGE FASCIA, PRE-FINISHED.
EL07	ALUMINUM SUNSHADES BY CURTAIN WALL MANUFACTURER
EL09	CNC CUT ALUMINUM STANDOFF BUILDING SIGNAGE, BACKLIT.
PN01	FACE OF WALL BELOW.
PN03	HVAC LOUVER
PN04	EXISTING STEEL TO BE REPAIRED AS NEEDED, SAND & REPAINT
WS03	EXISTING STEEL TRUSS TO REMAIN, SEE STRUCTURAL FOR SPECIFIED REPAIRS.
WS06	EXISTING MASONRY WALL BASE TO REMAIN.
WS07	FILL CAVITY WITH R-19 INSULATION, TYP.
WS08	CONCRETE FDN BY STRUCTURAL.
WS09	HVAC LOUVER BY HVAC.
WS10	METAL STUD FRAMING, REFER TO STRUCTURAL.
WS12	COMPACTED FILL.
WS13	VAPOR BARRIER.
WS14	EXISTING STEEL TO BE REPAIRED AS NEEDED, REFER TO STRUCTURAL, SANDED & PAINTED
WS15	ROOF CRICKET.
WS16	REFER TO ROOF PLAN FOR TYPICAL ROOF ASSEMBLY.
WS27	8" TUBE STEEL BOX FRAME.
WS28	FILL CAVITY WITH BATT INSULATION R-19.
WS32	CNC CUT ALUMINUM STANDOFF BUILDING SIGNAGE, BACKLIT.
WS35	1/2" SHEATHING, 1" RIGID INSULATION, STUCCO FINISH.



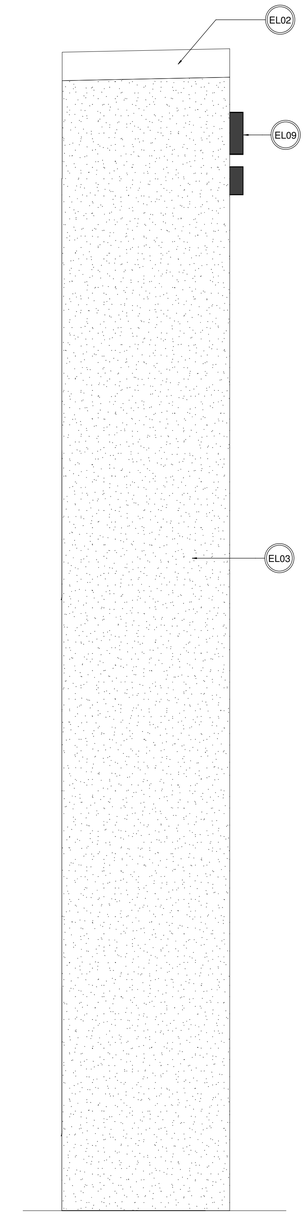
1 OPT 1 - ENLARGED PLAN @ MECHANICAL CHASE TOWER
1/4" = 1'-0"



2 OPT 1 - WALL SECTION @ HVAC CHASE
3/8" = 1'-0"



3 OPT 1 - HVAC CHASE EAST ELEVATION
3/8" = 1'-0"



4 OPT 1 - HVAC CHASE SOUTH ELEVATION
3/8" = 1'-0"

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VENTILATION TOWERS_OPT 1

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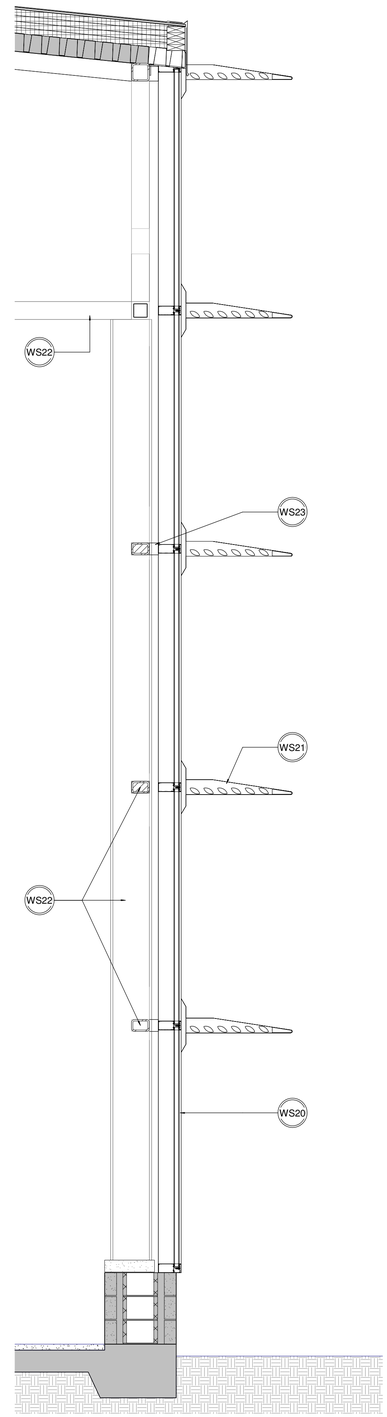

1 OPT 1 - TYPICAL CURTAIN WALL SECTION
1/2" = 1'-0"

SPECIFIC NOTES

TAG	NOTE
WS20	IMPACT RATED, INSULATED GLAZING CURTAIN WALL SYSTEM.
WS21	ALUMINUM SUNSHADES BY CURTAIN WALL MANUFACTURER.
WS22	EXISTING STEEL TO BE REPAIRED AS NEEDED. REFER TO STRUCTURAL, SAND AND PAINT.
WS23	CURTAIN WALL FASTENED TO EXISTING HSS BEAMS, PER CURTAIN WALL MANUFACTURER.

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WALL SECTIONS_OPT 1

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LONG CENTER NATATORIUM OPTION 2

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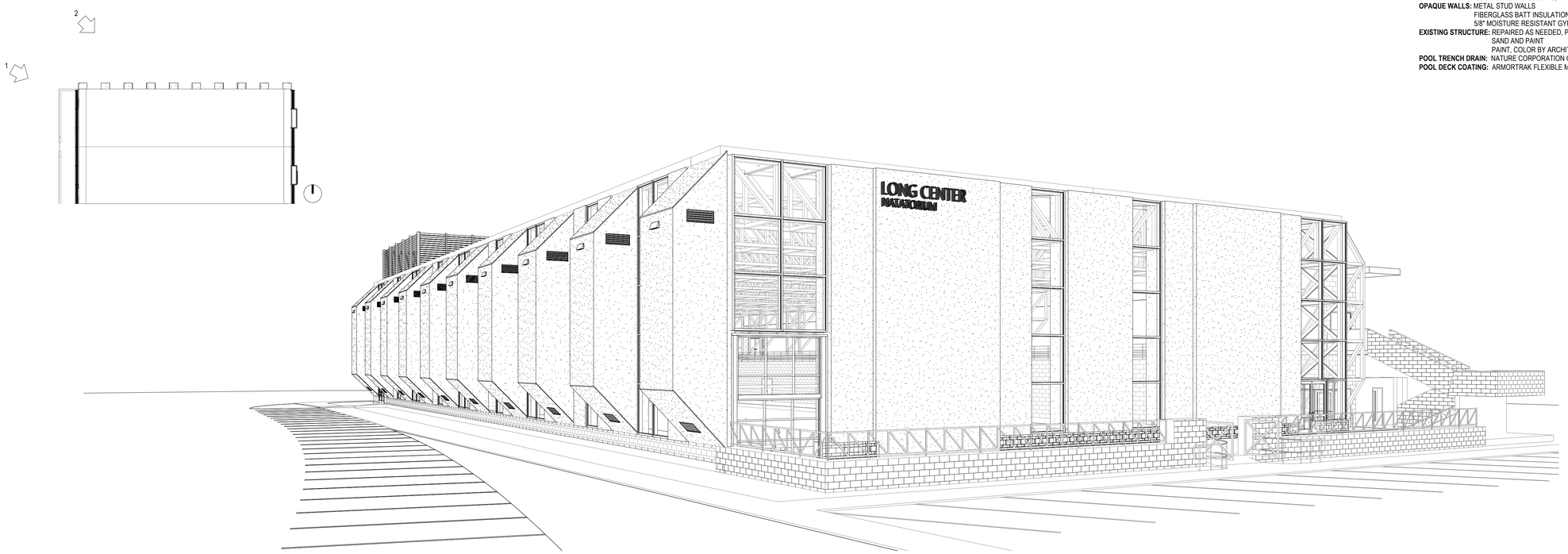
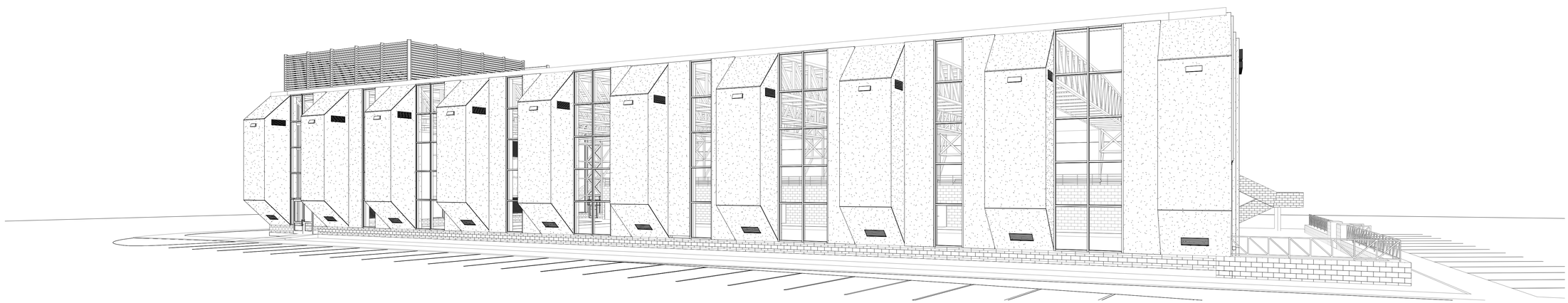
DESIGN CRITERIA

ROOF: 60 MIL TPO SINGLE PLY MEMBRANE
INSULATION: ROOF IS R-20 MIN POLYISO RIGID INSULATION
CURTAIN WALL: YKK - YHC 300 OG IMPACT RESISTANT SYSTEM
GLAZING: 1-1/4" INSULATED LOW E GLAZING, IMPACT RESISTANT
OPAQUE WALLS: METAL STUD WALLS
FIBERGLASS BATT INSULATION R-19 + 1" RIGID INSULATION
5/8" MOISTURE RESISTANT GYPSUM BOARD
EXISTING STRUCTURE: REPAIRED AS NEEDED, PER STRUCTURAL.
SAND AND PAINT
PAINT, COLOR BY ARCHITECT.
POOL TRENCH DRAIN: NATURE CORPORATION GMP GRATING
POOL DECK COATING: ARMORTRAK FLEXIBLE MILITARY GRADE URETHANE COATING



1 OPT - 2 3D VIEW -1



2 OPT - 2 3D VIEW -2

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3D VIEWS_OPT 2

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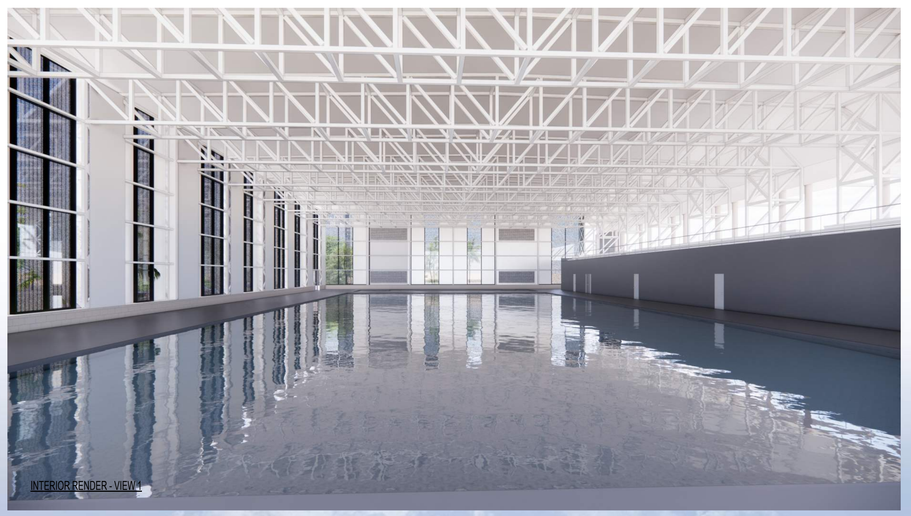
EXTERIOR RENDER - WEST - NORTH

EXTERIOR RENDER - EAST


INTERIOR RENDER - VIEW 1

INTERIOR RENDER - VIEW 2

EXTERIOR RENDER - NORTH

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RENDERINGS OPT_2

A-503

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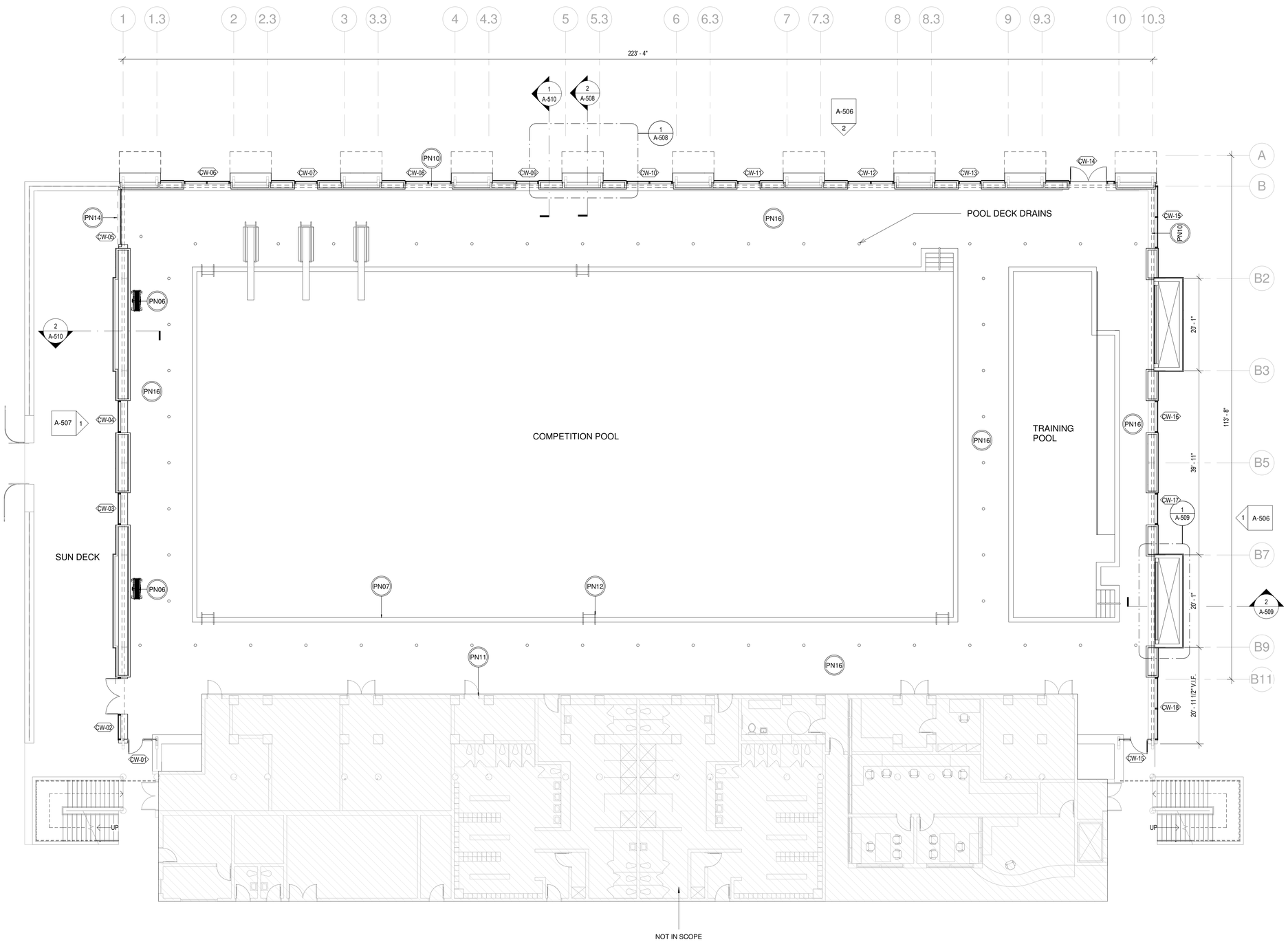


1 OPT 2 - LEVEL 1 - FLOOR PLAN
3/32" = 1'-0"

GENERAL NOTES

1. HATCHED AREA NOT INCLUDED IN SCOPE OF WORK UNLESS OTHERWISE NOTED.
2. PROVIDE SUPPORT FOR WALL MOUNTED CABINETS AND PLUMBING FIXTURES. STEEL STUDS SUPPORTING WALL MOUNTED FIXTURES TO BE DOUBLED AT 16 O.C. OR NOT LESS THAN 20 GAUGE PER FBC 2517.5.1.1.
3. COMBUSTIBLE MATERIALS IN TYPES I & II CONSTRUCTION TO COMPLY WITH FBC 603.1 (FIRE RETARDANT - TREATED WOOD) AND 805.1 & 806.1
4. PROVIDE CEMENTITIOUS BACKER BOARD IN PLACE OF GWB AT ALL LOCATIONS SHOWING CERAMIC OR PORCELAIN TILE FINISH.
5. SEE SHEET ID100 - ID10X FOR FINISH PLANS.
6. SEE SHEET AX.X FOR PLAN DETAIL CALLOUTS.
7. SEE SHEET AX.X FOR PARTITION TYPE DETAILS. PROVIDE ACOUSTICAL BATT INSULATION WHERE INDICATED.
8. SEE SHEET AX.X FOR DIMENSION PLANS.
9. SEE SHEET AX.X FOR DOOR SCHEDULE.
10. SEE ENLARGED PLANS FOR ADDITIONAL WALL TAG INFORMATION.

TAG LEGEND

ELEMENT TAGS

Room name 101 — ROOM TAG

1001X — DOOR TAG

ST-X — STOREFRONT TAG

X 6 / X 6 — WALL TAG

XXX — SPECIALTY EQUIPMENT TAG

1t — FLOOR TAG

VIEW TAGS

Ref / 1 / A101 / 1 / Ref — EXTERIOR ELEVATION

1 Ref / Ref / A101 / Ref / 1 Ref — INTERIOR ELEVATION

SIM / 1 / A101 — SECTION MARK

SIM / 1 / A101 — VIEW CALLOUT

Name / Elevation — LEVEL HEAD

1'-0" / A.F.F — SPOT ELEVATION MARK

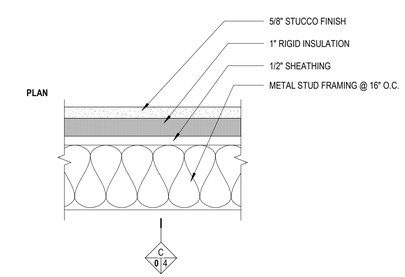
ANNOTATION TAGS

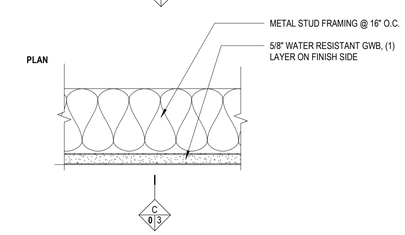
ALIGNMENT TAG — ALIGN

SPECIFIC NOTE TAG — XXX

SPECIFIC NOTES

TAG	NOTE
PN06	SIDEKICK BIG ASS FAN, PLUG-IN TYPE, PROPELLER STYLE ON WHEELS.
PN07	PROVIDE NEW POOL EDGE AND TRENCH DRAIN ASSEMBLY TO MATCH TRAINING POOL.
PN10	EXISTING BEAM ABOVE.
PN11	SAND AND PAINT DOOR FRAMES.
PN12	REMOVE AND REPLACE POOL ACCESSORIES TO REPLACE POOL EDGE.
PN14	CROWN SST-II HYDRAULIC BI-FOLD DOOR SYSTEM.
PN16	EPOXY DECK COATING THROUGHOUT POOL DECK.





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LEVEL 1 - FLOOR PLAN_OPT 2

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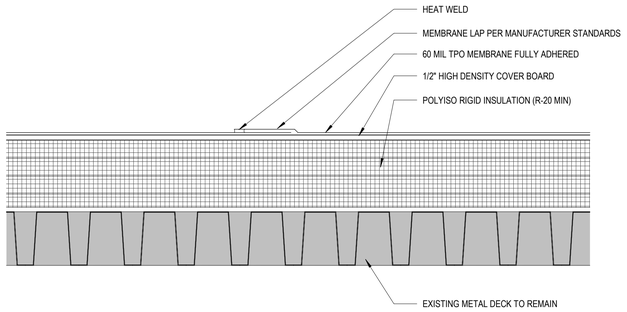
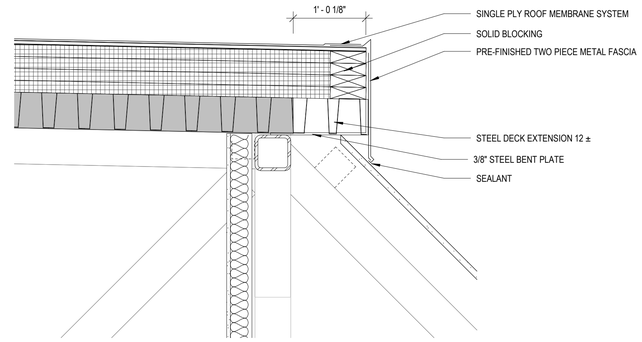
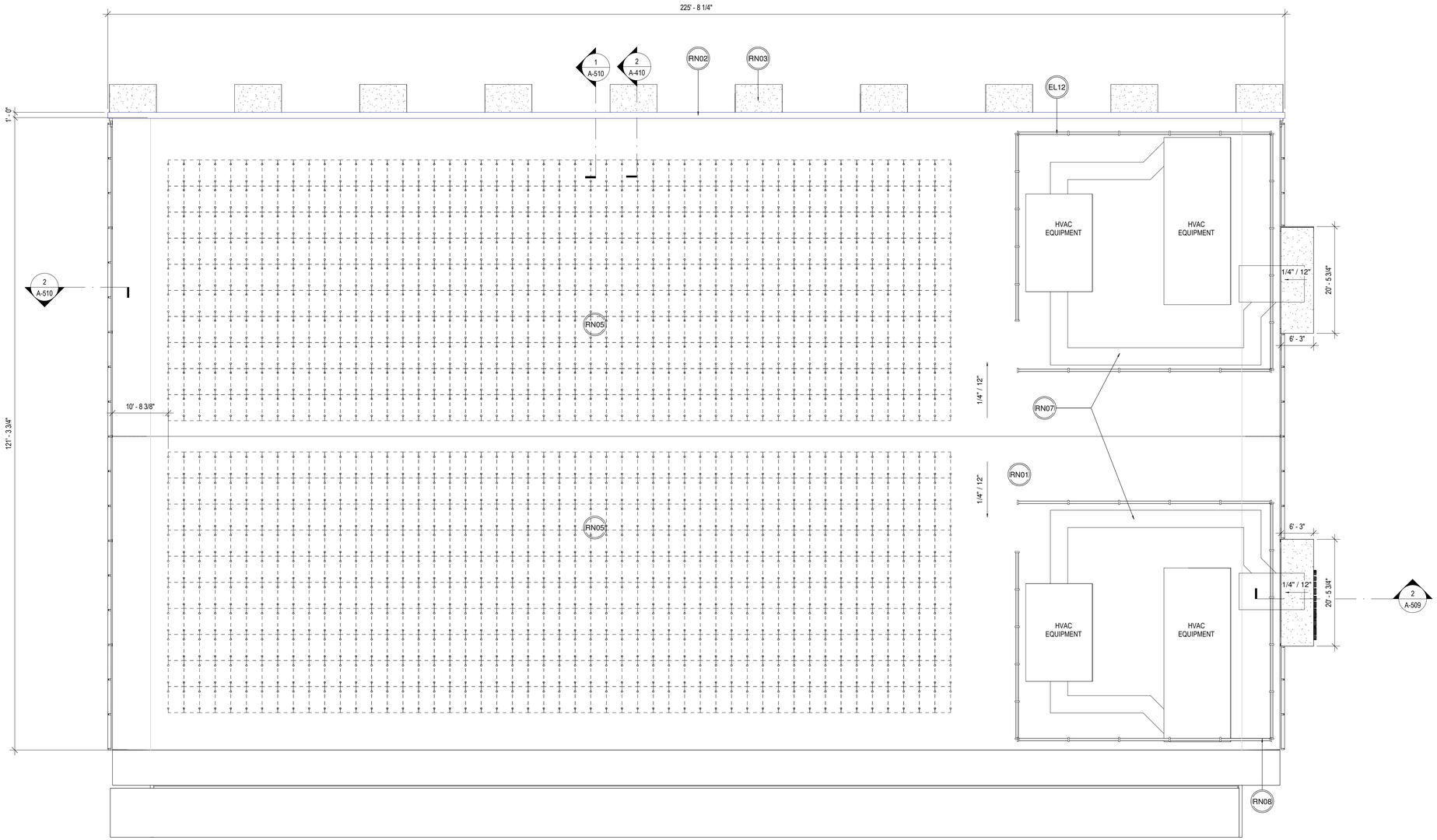


2 DETAIL - TYPICAL TPO ROOF ASSEMBLY
1 1/2" = 1'-0"



3 TYP. NORTH ROOF EDGE
1" = 1'-0"



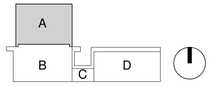
1 OPT 2 - ROOF PLAN
3/32" = 1'-0"

GENERAL NOTES

1. ROOFING PRODUCT BASIS-OF-DESIGN: 60 MIL TPO SINGLE PLY MEMBRANE ROOF OR APPROVED EQUAL (COLOR WHITE) RIGID INSULATION BOARD MECHANICALLY FASTENED TO STEEL ROOF DECK. INSULATION TO HAVE AN AVERAGE R-20 @ ALL ROOFS OVER CONDITIONED SPACES. PROVIDE ROOFING COMPONENTS AND MATERIALS APPROVED BY THE ROOFING PRODUCT MANUFACTURER. ASSEMBLE ROOFING COMPONENTS INCLUDING FLASHING, ROOF DRAINS, ETC. PER THE ROOFING PRODUCT MANUFACTURER'S DETAILS AND INSTRUCTIONS SO AS TO QUALIFY FOR, AND RECEIVE A SPECIAL 20-YEAR WEATHER-TIGHTNESS WARRANTY FROM THE MANUFACTURER AS WELL AS A SPECIAL 2-YEAR PROJECT WARRANTY FROM THE ROOFING INSTALLER COVERING ALL COMPONENTS OF THE ROOFING SYSTEM SUCH AS ROOFING, BASE FLASHING, ROOF INSULATION, FASTENERS, COVER BOARDS, ETC. PROVIDE ROOFING FROM A QUALIFIED MANUFACTURER THAT IS FM GLOBAL APPROVED FOR ROOFING SYSTEM IDENTICAL TO THAT USED FOR THIS PROJECT.
2. PROVIDE METAL ROOF COPINGS AND PARAPET FASCIAS FABRICATED OF ASTM B209 0.050-INCH ALUMINUM SHEET. COMPLY WITH "THE NRCA ROOFING MANUAL" AND THE SMACNA "ARCHITECTURAL SHEET METAL MANUAL REQUIREMENTS FOR DIMENSIONS AND PROFILES SHOWN UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED. PROVIDE MANUFACTURER'S 20-YEAR FINISH WARRANTY. SECURE COPINGS TO PARAPETS WITH CONT ALUMINUM CLEATS.
3. PROVIDE GALVANIZED STEEL INTERNALLY REINFORCED ROOF-CURB UNITS CAPABLE OF SUPPORTING SUPERIMPOSED LIVE AND DEAD LOADS, INCLUDING EQUIPMENT LOADS, WITH WELDED OR MECHANICALLY FASTENED, NON-SAG SEALED JOINTS AND INTEGRALLY FORMED DECK-MOUNTING FLANGE AT PERIMETER BOTTOM. COORDINATE DIMENSIONS WITH ROUGHING-IN INFORMATION ON SHOP DRAWINGS OF EQUIPMENT TO BE SUPPORTED.
4. ROOF DRAIN BASIS-OF-DESIGN: Z125 8 3/8" DIAMETER ROOF DRAIN WITH LOW SILHOUETTE DOME MANUFACTURED BY ZURN INDUSTRIES.
5. GENERAL - IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO PROVIDE FOR A COMPLETE AND WEATHERTIGHT INSTALLATION OF ALL ROOF ITEMS, PENETRATIONS, ETC. THE CONTRACTOR SHALL PROVIDE ALL ROOF ACCESSORIES, FLASHING, SEALANT, SCUPPERS, DRAINS, LABOR, MATERIALS, EQUIPMENT, ETC. REQUIRED FOR COMPLETION OF A WEATHERTIGHT ROOF INSTALLATION. FOLLOW ALL RECOMMENDATIONS OF THE NRCA REGARDING INSTALLATION PROCEDURES, UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED
6. SLOPE - ROOF SURFACE SHALL HAVE A MINIMUM SLOPE OF 1/4" PER FOOT IN A PERPENDICULAR DIRECTION FROM THE ROOF EDGE DOWN TOWARD THE ROOF DRAINS AS INDICATED BY THE ARROWS DRAWN ON THE ROOF PLAN. WHERE REQUIRED TO FACILITATE DRAINAGE, PROVIDE VALLEYS, CRICKETS, RIDGES, ETC. OF REQUIRED SLOPE TO PROPERLY DRAIN ALL ROOF SURFACES.
7. ROOF DRAINS - COORDINATE LOCATION OF ALL ROOF DRAINS TO AVOID RATED WALLS, BEAMS, COLUMNS, JOISTS, ETC. BELOW.
8. PENETRATIONS - PROPERLY FLASH, WATERPROOF, SECURE AND SEAL ALL ITEMS THAT PENETRATE THE ROOF MEMBRANE. DO NOT INSTALL ANY PITCH POCKETS. FOLLOW GUIDELINES OF NRCA CONCERNING FLASHING AND WATERPROOFING ALL ROOF PENETRATIONS. SEE ROOF DETAILS
9. ROOF EQUIPMENT - MOUNT ALL ROOF EQUIPMENT ON PREFABRICATED EQUIPMENT SUPPORT CURBS WITH INTEGRAL INSULATION. WHERE EQUIPMENT IS RAISED ABOVE ROOF SURFACE, ALIGN SUPPORTS PARALLEL TO DIRECTION OF WATERFLOW TO FACILITATE DRAINAGE. VERIFY ALL REQUIREMENTS WITH EQUIPMENT AND CURB MANUFACTURERS. WHERE ROOF MEMBRANE EXTENDS BENEATH EQUIPMENT, MOUNT EQUIPMENT ABOVE THE ROOF SURFACE IN ACCORDANCE WITH BUILDING CODE AND NRCA REQUIREMENTS TO ALLOW FOR INSTALLATION OF ALL REQUIRED ROOFING COMPONENTS AND TO ALLOW FOR FUTURE OWNER MAINTENANCE.
10. LIGHTNING PROTECTION - REFER TO ELECTRICAL DRAWINGS PROTECTION FOR ALL LIGHTNING PROTECTION. GROUNDING RODS, CABLES, CONNECTIONS, ETC. SHALL BE INSTALLED IN SUCH A MANNER TO PREVENT ANY DAMAGE TO INSTALLED ROOF MEMBRANE. GROUNDING RODS SHALL BE FASTENED TO THE SUBSTRATE ON WHICH THEY ARE MOUNTED. PROVIDE ALL REQUIRED FLASHING, SEALANT, WATERPROOFING, NON-CORROSIVE FASTENERS, ETC. AT EACH LOCATION AND AT MEMBRANE PENETRATION POINTS.

SPECIFIC NOTES

TAG	NOTE
EL12	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.
RN01	60 MIL SINGLE PLY TPO ROOF MEMBRANE.
RN02	12" ROOF EXTENSION, REFER TO SECTION DETAIL.
RN03	TOP OF TRUSS BELOW.
RN05	PHOTOVOLTAIC ARRAY.
RN07	PROVIDE STEEL SUPPORT FRAMES FOR DUCT WORK @ 48" O.C.
RN08	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.



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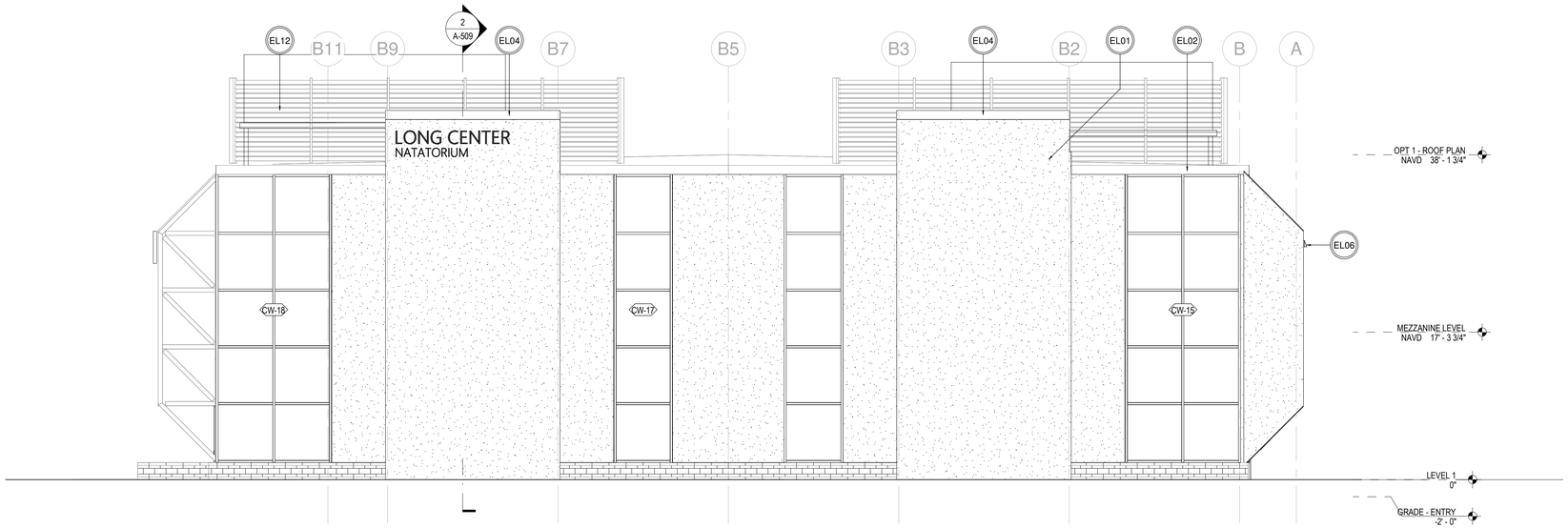
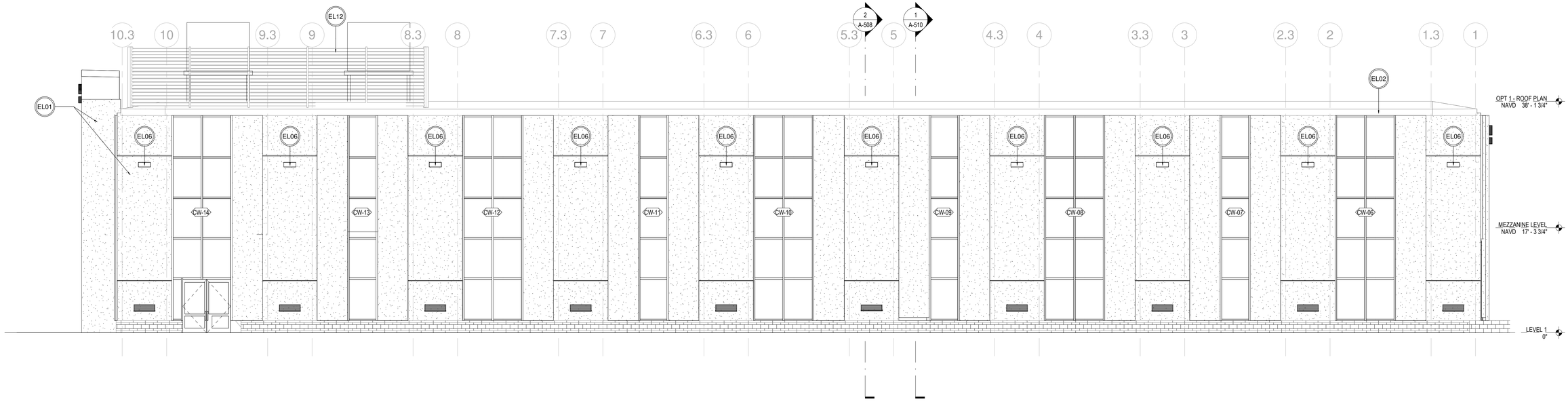
ROOF PLAN_OPT 2

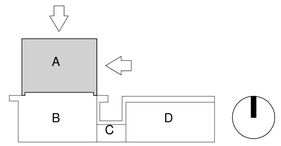
A-505



1 OPT 2 - EAST ELEVATION
1/8" = 1'-0"



2 OPT - 2 NORTH ELEVATION
1/8" = 1'-0"



SPECIFIC NOTES

TAG	NOTE
EL01	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL04	TWO PIECE ROOF EDGE FASCIA, PRE-FINISHED.
EL06	EXTERIOR LIGHT FIXTURE
EL12	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.

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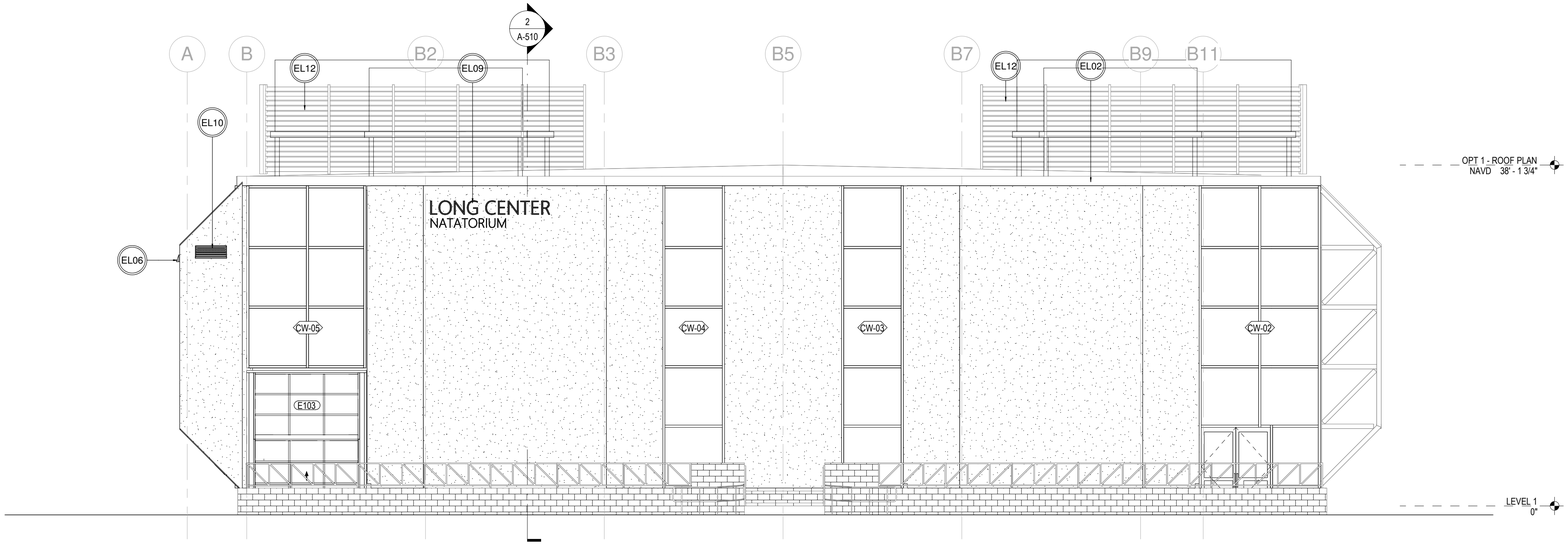
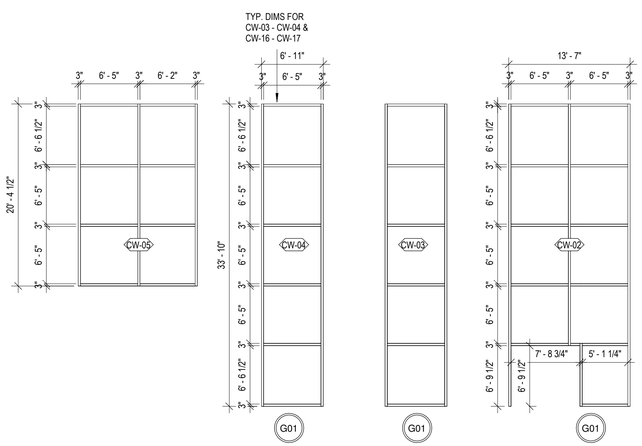
EXTERIOR ELEVATIONS_OPT 2

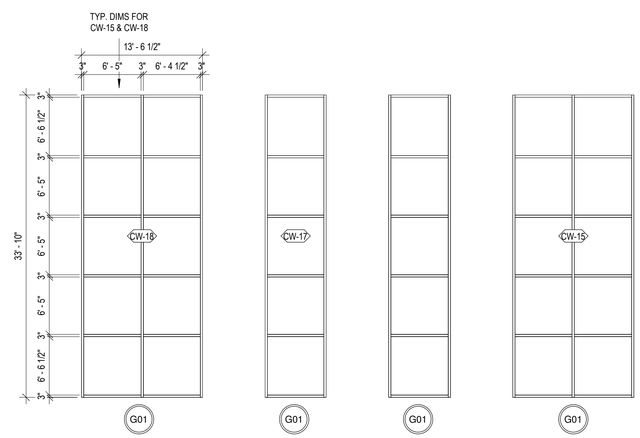
A-506



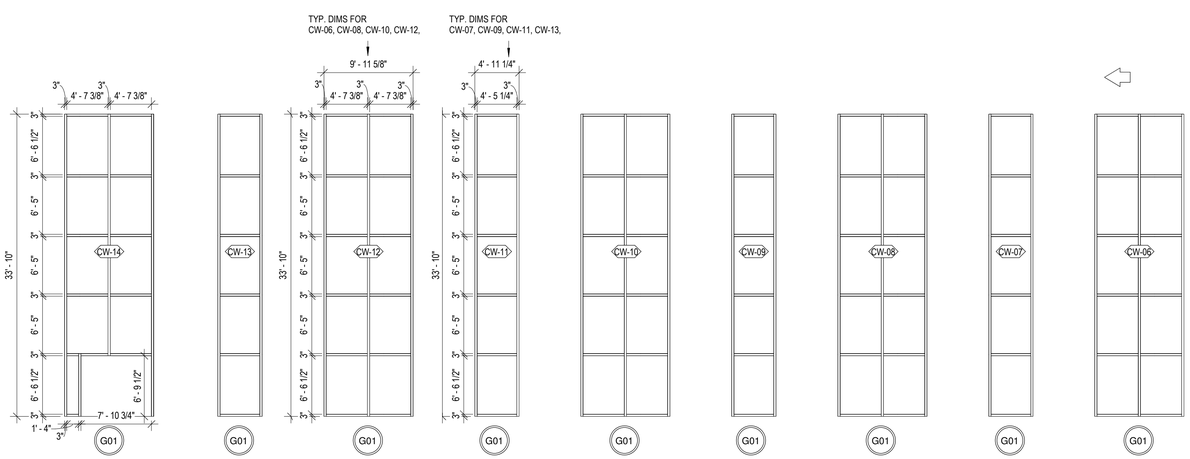
1 OPT 2 - WEST ELEVATION
1/8" = 1'-0"



2 OPT 2 - CURTAIN WALL ELEVATION - WEST
1/8" = 1'-0"



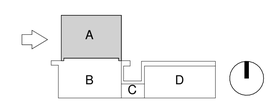
3 OPT 2 - CURTAIN WALL ELEVATIONS - EAST
1/8" = 1'-0"



4 OPT 2 - CURTAIN WALL ELEVATIONS - NORTH
1/8" = 1'-0"

SPECIFIC NOTES

TAG	NOTE
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL06	EXTERIOR LIGHT FIXTURE
EL09	CNC CUT ALUMINUM STANDOFF BUILDING SIGNAGE, BACKLIT.
EL10	VENTS FOR NATURAL VENTILATION.
EL12	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.
G01	1-1/4" INSULATED, IMPACT RESISTANT SAFETY GLAZING.



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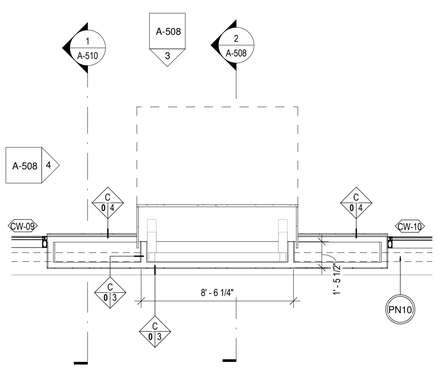
EXTERIOR ELEVATIONS_OPT 2

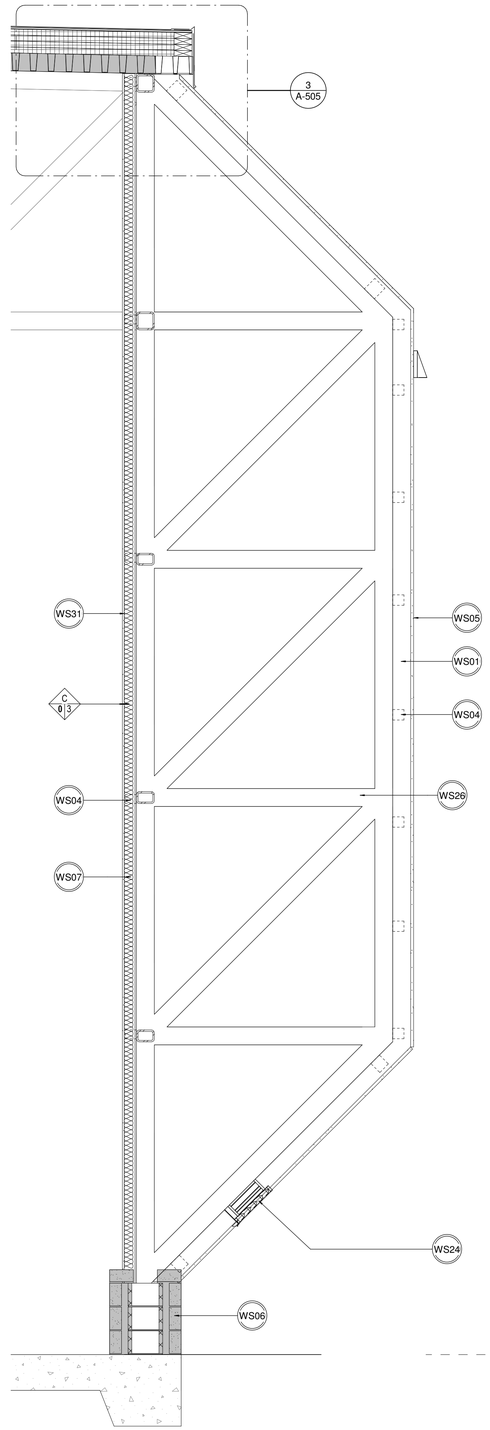
A-507

SPECIFIC NOTES

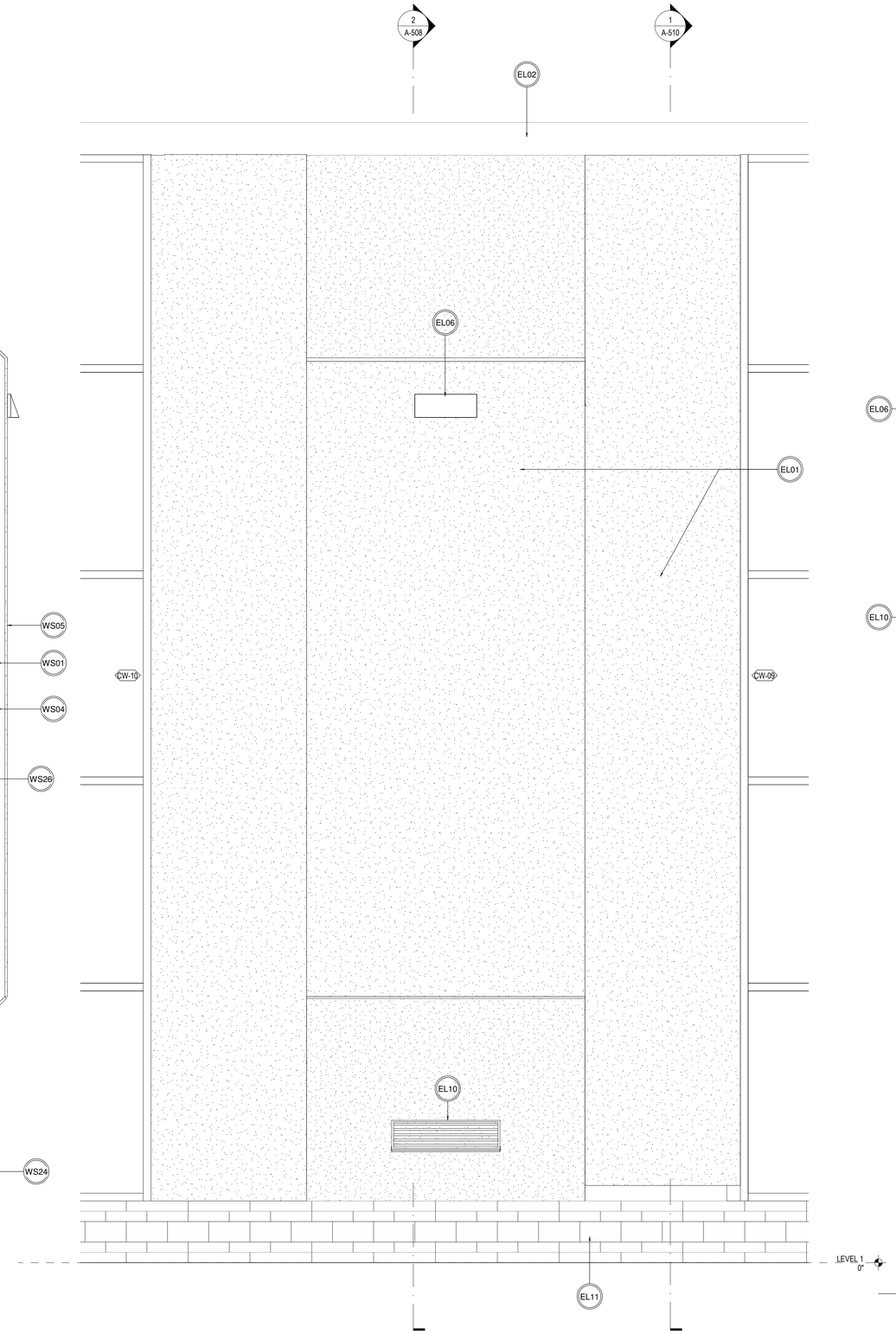
TAG	NOTE
EL01	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL06	EXTERIOR LIGHT FIXTURE
EL10	VENTS FOR NATURAL VENTILATION.
EL11	EXISTING MASONRY BASE TO BE CLEANED AND REPOINTED AS NEEDED.
PN10	EXISTING BEAM ABOVE.
WS01	3 5/8" METAL STUDS FASTENED TO EXISTING TRUSS FRAME @ 16" O.C..
WS04	FRAMING CLIP @ EVERY HORIZONTAL HSS MEMEBER OR 24" O.C. VERTICALLY.
WS05	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING, SAND FINISH - PTD.
WS06	EXISTING MASONRY WALL BASE TO REMAIN.
WS07	FILL CAVITY WITH R-19 INSULATION, TYP.
WS24	VENTS FOR NATURAL VENTILATION.
WS26	STEEL FRAME TRUSS TO BE SANDBLASTED & REPAINTED, TYP.
WS31	5/8" THK WATER RESISTANT GYPSUM BOARD.



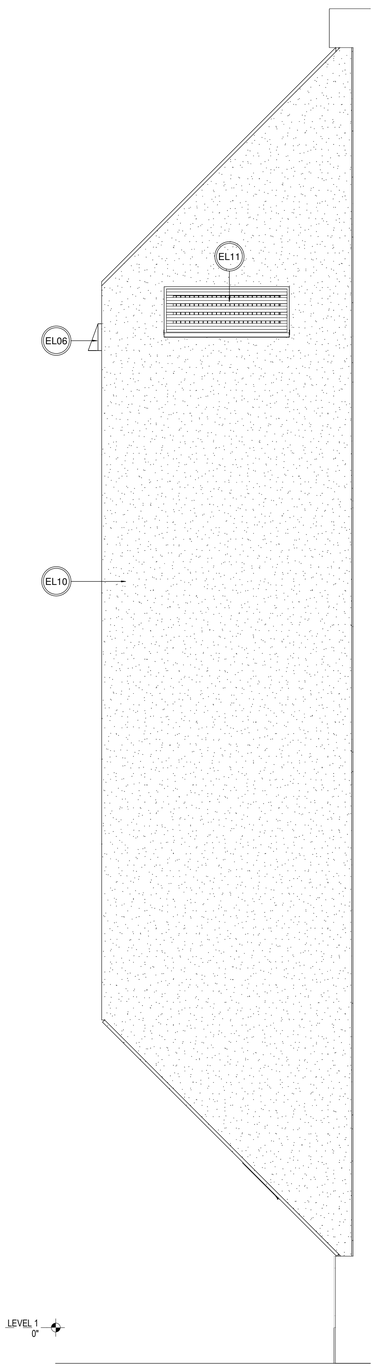
1 OPT 2 - ENLARGED PLAN @ TRUSS
1/4" = 1'-0"



2 OPT 2 - SECTION @ TRUSS FRAME
1/2" = 1'-0"



3 OPT 2 - TRUSS NORTH ELEVATION
1/2" = 1'-0"



4 OPT 2 - TRUSS SIDE ELEVATION
1/2" = 1'-0"

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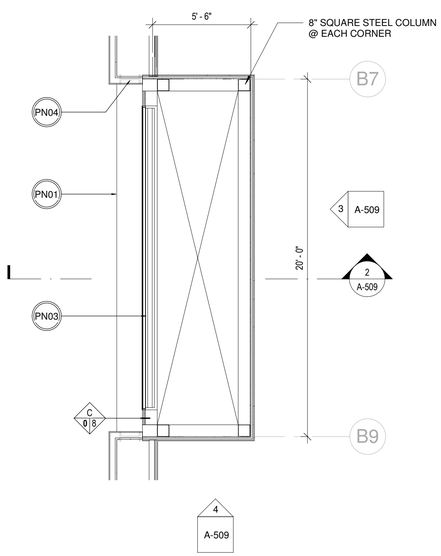
EXTERIOR TRUSS PLANS, ELEVATIONS & SECTION_OPT 2

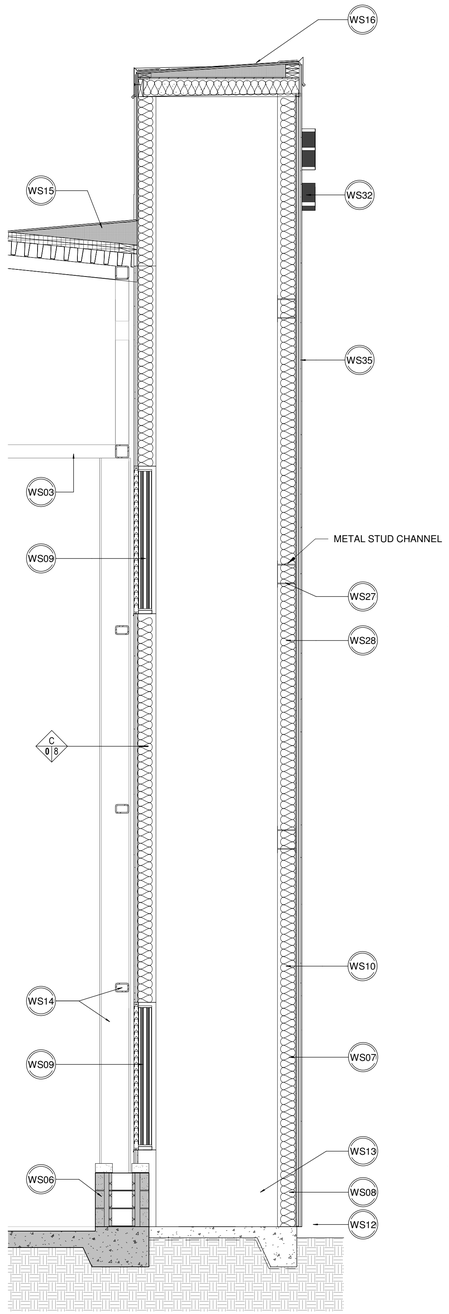
A-508

SPECIFIC NOTES

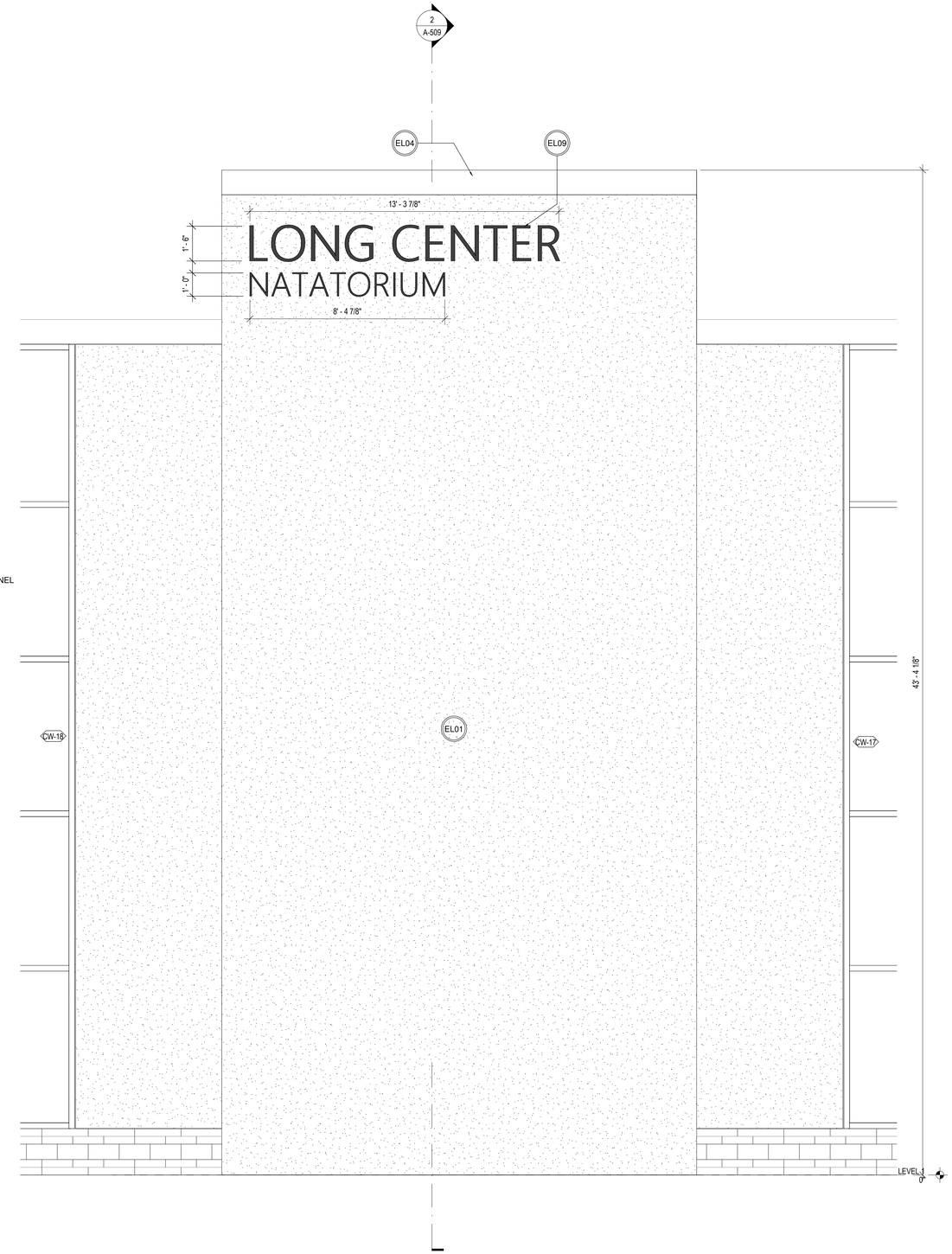
TAG	NOTE
EL01	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL04	TWO PIECE ROOF EDGE FASCIA, PRE-FINISHED.
EL09	CNC CUT ALUMINUM STANDOFF BUILDING SIGNAGE, BACKLIT.
PN01	FACE OF WALL BELOW.
PN03	HVAC LOUVER
PN04	EXISTING STEEL TO BE REPAIRED AS NEEDED, SAND & REPAINT
WS03	EXISTING STEEL TRUSS TO REMAIN, SEE STRUCTURAL FOR SPECIFIED REPAIRS.
WS06	EXISTING MASONRY WALL BASE TO REMAIN.
WS07	FILL CAVITY WITH R-19 INSULATION, TYP.
WS08	CONCRETE FDN BY STRUCTURAL.
WS09	HVAC LOUVER BY HVAC.
WS10	METAL STUD FRAMING, REFER TO STRUCTURAL.
WS12	COMPACTED FILL.
WS13	VAPOR BARRIER.
WS14	EXISTING STEEL TO BE REPAIRED AS NEEDED, REFER TO STRUCTURAL, SANDED & PAINTED
WS15	ROOF CRICKET.
WS16	REFER TO ROOF PLAN FOR TYPICAL ROOF ASSEMBLY.
WS27	8" TUBE STEEL BOX FRAME.
WS28	FILL CAVITY WITH BATT INSULATION R-19.
WS32	CNC CUT ALUMINUM STANDOFF BUILDING SIGNAGE, BACKLIT.
WS35	1/2" SHEATHING, 1" RIGID INSULATION, STUCCO FINISH.



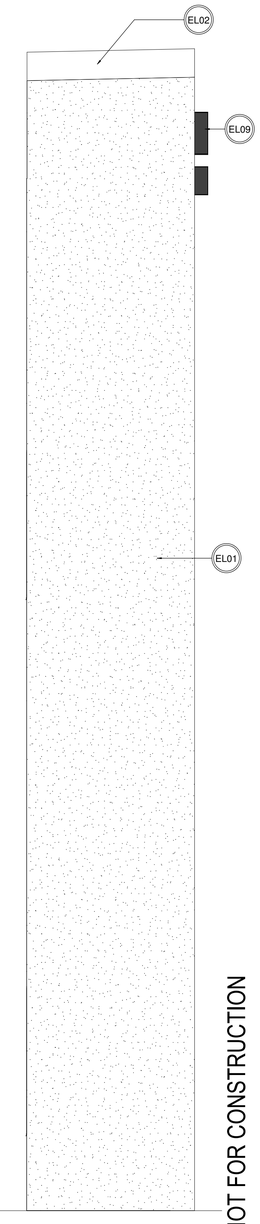
1 OPT 2 - ENLARGED PLAN @ MECHANICAL CHASE TOWER
1/4" = 1'-0"



2 OPT 2 - WALL SECTION @ HVAC CHASE
3/8" = 1'-0"



3 OPT 2 - HVAC CHASE EAST ELEVATION
3/8" = 1'-0"



4 OPT 2 - HVAC CHASE SOUTH ELEVATION
3/8" = 1'-0"

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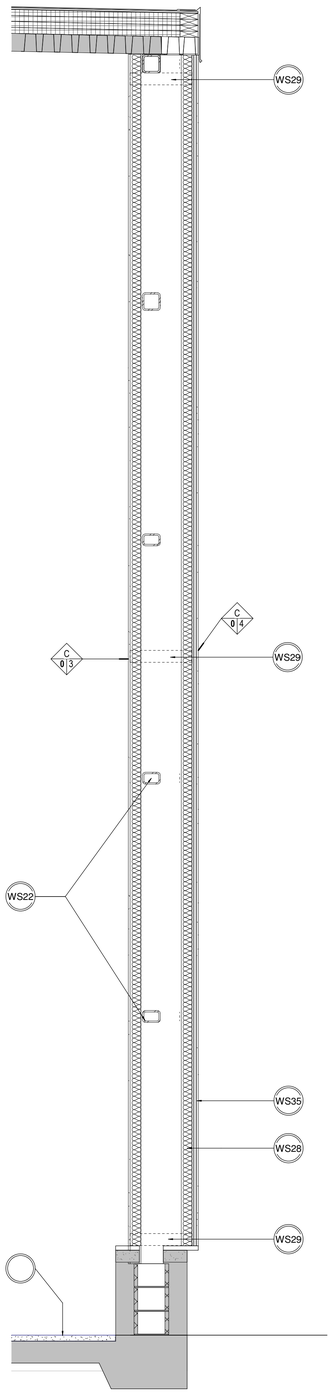
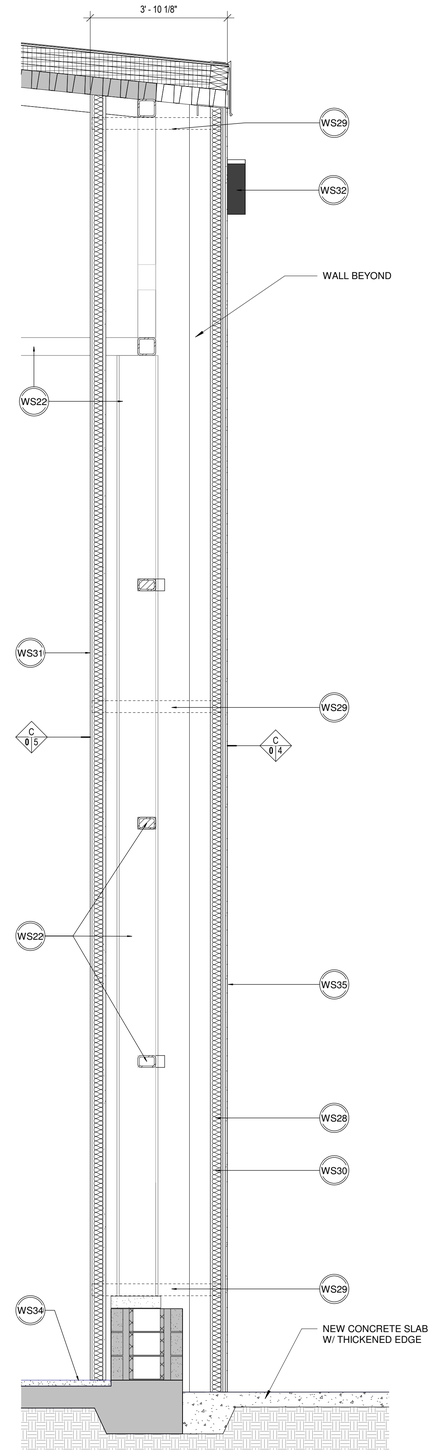
VENTILATION TOWERS_OPT 2

A-509



1 OPT 2 - TYP NORTH WALL SECTION
1/2" = 1'-0"



2 OPT 2 - TYPICAL WEST WALL SECTION
1/2" = 1'-0"

SPECIFIC NOTES

TAG	NOTE
WS22	EXISTING STEEL TO BE REPAIRED AS NEEDED. REFER TO STRUCTURAL, SAND AND PAINT.
WS28	FILL CAVITY WITH BATT INSULATION R-19.
WS29	METAL STUD BRACING.
WS30	METAL STUD FRAMING @ 16" O.C.
WS31	5/8" THK WATER RESISTANT GYPSUM BOARD.
WS32	CNC CUT ALUMINUM STANDOFF BUILDING SIGNAGE, BACKLIT.
WS34	REFER TO FLOOR PLAN FOR POOL DECK COATING.
WS35	1/2" SHEATHING, 1" RIGID INSULATION, STUCCO FINISH.

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WALL SECTIONS_OPT 2

A-510

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DRAWING INDEX ENCLOSED SUN-DECK

SHEET #	SHEET NAME	SD BID PACKAGE
01 GENERAL		
G-105	COVER_ENCLOSED SUN-DECK_2B	●
G-106	SHEET INDEX_ENCLOSED SUN-DECK_2B	
06 DEMO		
AD-101	DEMO FLOOR PLAN_ENCLOSED SUN-DECK	●
07 ARCHITECTURAL		
A-515	ENCLOSED SUN-DECK WEST ELEVATION_2B	●
A-516	RENDERINGS ENCLOSED SUN-DECK_2B	●
A-517	LEVEL 1 - FLOOR PLAN_ENCLOSED SUN-DECK_2B	●
A-518	ENCLOSED SUN-DECK ENLARGED PLAN & SECTION_2B	●

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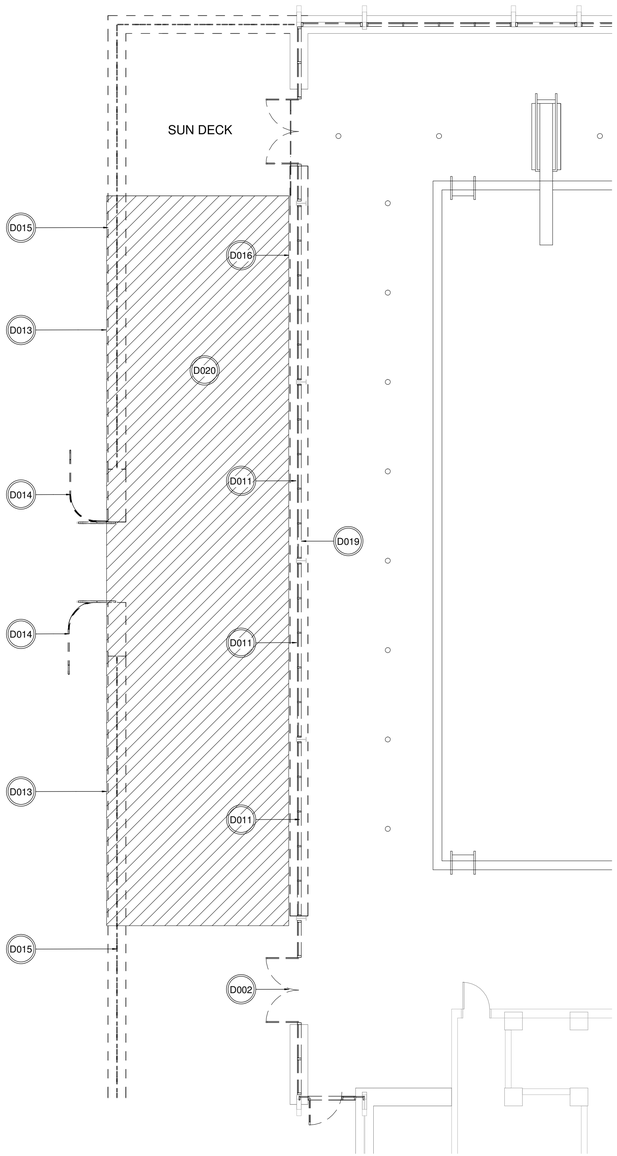
SHEET INDEX_ENCLOSED SUN-DECK_2B

G-106



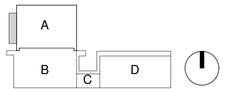
1 DEMOLITION FLOOR PLAN - ENCLOSED SUN DECK
1/8" = 1'-0"

GENERAL NOTES - DEMOLITION

1. ALL DIMENSIONS AND CONDITIONS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO WORK, NOTIFY ARCHITECT IF CONFLICTS ARE FOUND
2. PROTECT ALL AREAS TO REMAIN. G.C. TO REPAIR OR REPLACE ANY ITEM TO REMAIN OR TO BE RELOCATED THAT IS DAMAGED DURING THE WORK. PROVIDE A SEAMLESS, UNDAMAGED APPEARANCE WHEN JOINING NEW TO EXISTING
3. REMOVE DASHED PORTION OF EXISTING WALLS, DOORS, WINDOWS, SIDELIGHTS, TRANSOMS, AND FRAMES. PREPARE AREA TO RECEIVE NEW CONSTRUCTION AS SCHEDULED.
4. FINISHES - ALL EXISTING FINISHES SHALL REMAIN, UNLESS SCHEDULED FOR NEW. CONTINUE EXISTING FINISHES TO REMAIN INTO NEW EXTENDED AREAS THAT ARE ADJACENT. PATCH & REPAIR EXISTING TO MATCH NEW. PREPARE SUBSTRATES TO RECEIVE NEW FINISHES WHERE SCHEDULED. FINISH ALL PATCHED OR EXTENDED WALLS TO NEAREST CHANGE OF DIRECTION, WALL TERMINATION, OR INTERSECTION. PHASING - COORDINATE EQUIPMENT DELIVERIES AND INSTALLATION WITH THE PHASING PLAN FOR APPROPRIATE SCHEDULING.
5. CONFLICTS - ANY CONFLICT FOUND WITH EXISTING CONDITIONS AND REQUIREMENTS FOR NEW CONSTRUCTION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT. IF THE CONFLICT AFFECTS THE PROGRESS OF THE WORK, VERIFY WITH ARCHITECT SOLUTION NECESSARY PRIOR TO PROCEEDING WITH THAT PORTION OF THE WORK AND IN A TIMELY FASHION SO AS NOT TO DELAY THE WORK. COORDINATE ALL TRADES TO ASCERTAIN NO FURTHER WORK WILL BE IMPACTED BY THE CONFLICT, OR ITS SOLUTION.

DEMOLITION KEY NOTES

TAG	NOTE
D002	DEMOLISH EXISTING DOOR & FRAME ENTIRELY.
D011	DEMOLISH GLAZYNG SYSTEM ENTIRELY, STEEL STRUCTURE TO REMAIN.
D013	DEMOLISH SUN DECK WALL & ASSOCIATED FOUNDATIONS.
D014	DEMOLISH SUN DECK GATE.
D015	DEMOLISH SUN DECK FENCE.
D016	DEMOLISH KNEE WALL 1' BELOW GRADE.
D019	DEMOLISH STRUCTURAL STEEL.
D020	DEMOLISH EXISTING SLAB.



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PRELIMINARY NOT FOR CONSTRUCTION

LONG CENTER NATATORIUM

CITY OF CLEARWATER
1501 N BELCHER RD, CLEARWATER FL, 33765

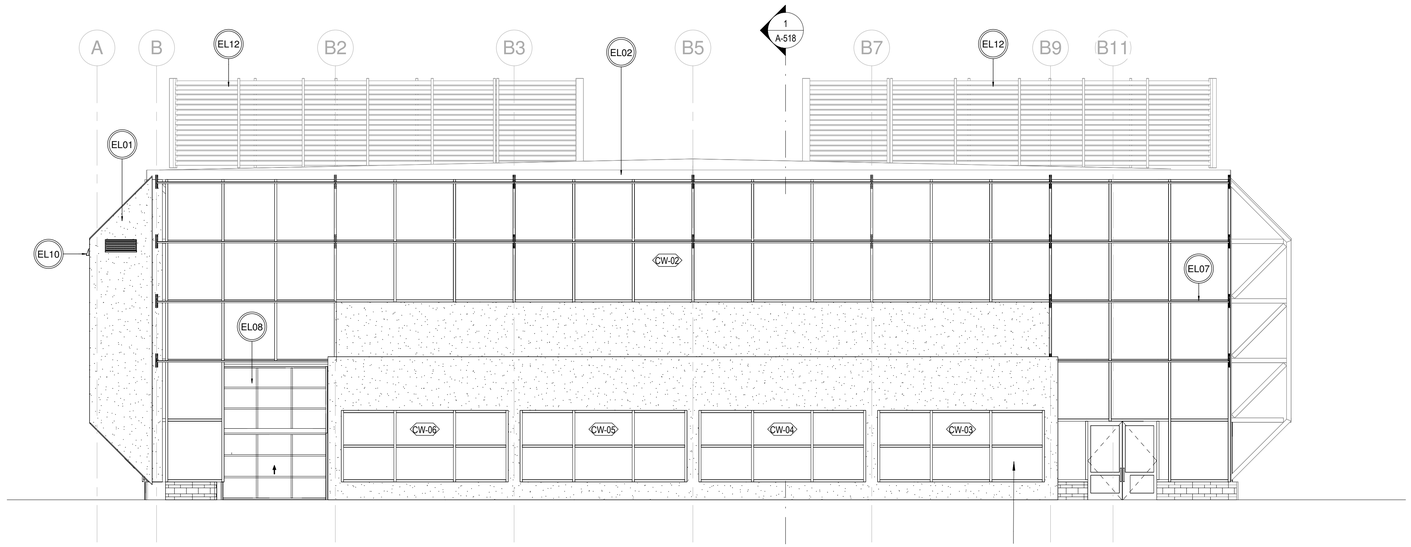
Project number
0000

DISTRIBUTION

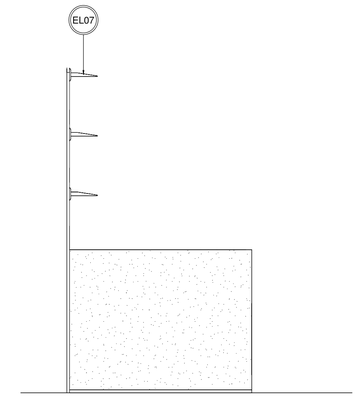
MILESTONE	DATE
SCHEMATIC BID SET	10.23.23

DEMO FLOOR PLAN_ENCLOSED SUN-DECK

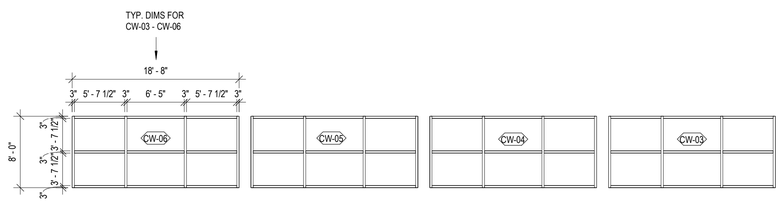
AD-101



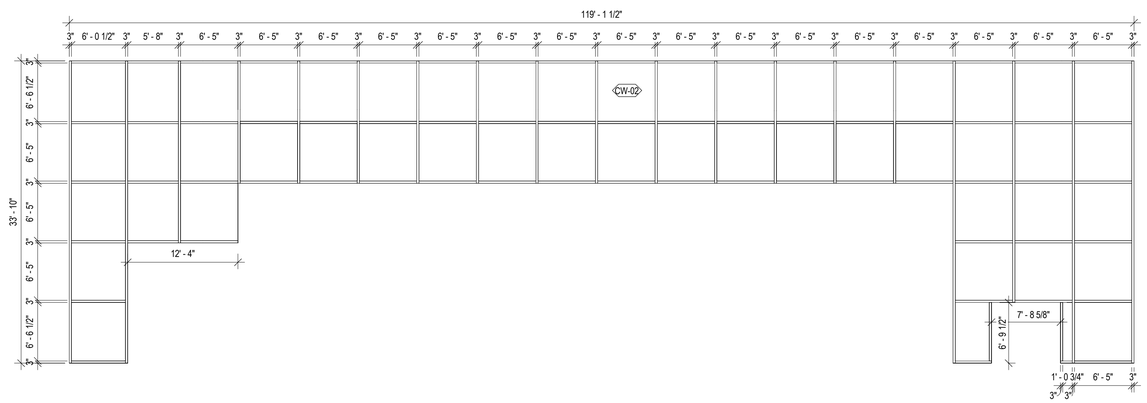
1 WEST ELEVATION - ENCLOSED SUN-DECK
1/8" = 1'-0"



2 NORTH ELEVATION - ENCLOSED SUN-DECK
1/8" = 1'-0"



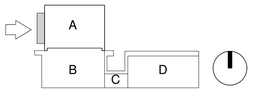
3 CURTAIN WALL ELEVATIONS - WEST
1/8" = 1'-0"



4 CURTAIN WALL ELEVATIONS - WEST CW-02
1/8" = 1'-0"

SPECIFIC NOTES

TAG	NOTE
EL01	THREE PART STUCCO SYSTEM OVER LATH & WEATHERPROOFING
EL02	TWO PIECE PRE FINISHED ALUMINUM ROOF FASCIA.
EL07	ALUMINUM SUNSHADES BY CURTAIN WALL MANUFACTURER
EL08	CROWN SST-II HYDRAULIC BI-FOLD DOOR SYSTEM.
EL10	VENTS FOR NATURAL VENTILATION.
EL12	LOUVERED ROOF EQUIPMENT SCREEN WALL, HEIGHT TO BE DETERMINED.



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LONG CENTER NATATORIUM

CITY OF CLEARWATER

1501 N BELCHER RD. CLEARWATER FL. 33765

Project number
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ENCLOSED SUN-DECK WEST ELEVATION_2B

A-515

EXTERIOR RENDER - WEST - NORTH

INTERIOR RENDER - VIEW 1

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RENDERINGS ENCLOSED SUN-DECK_2B

A-516

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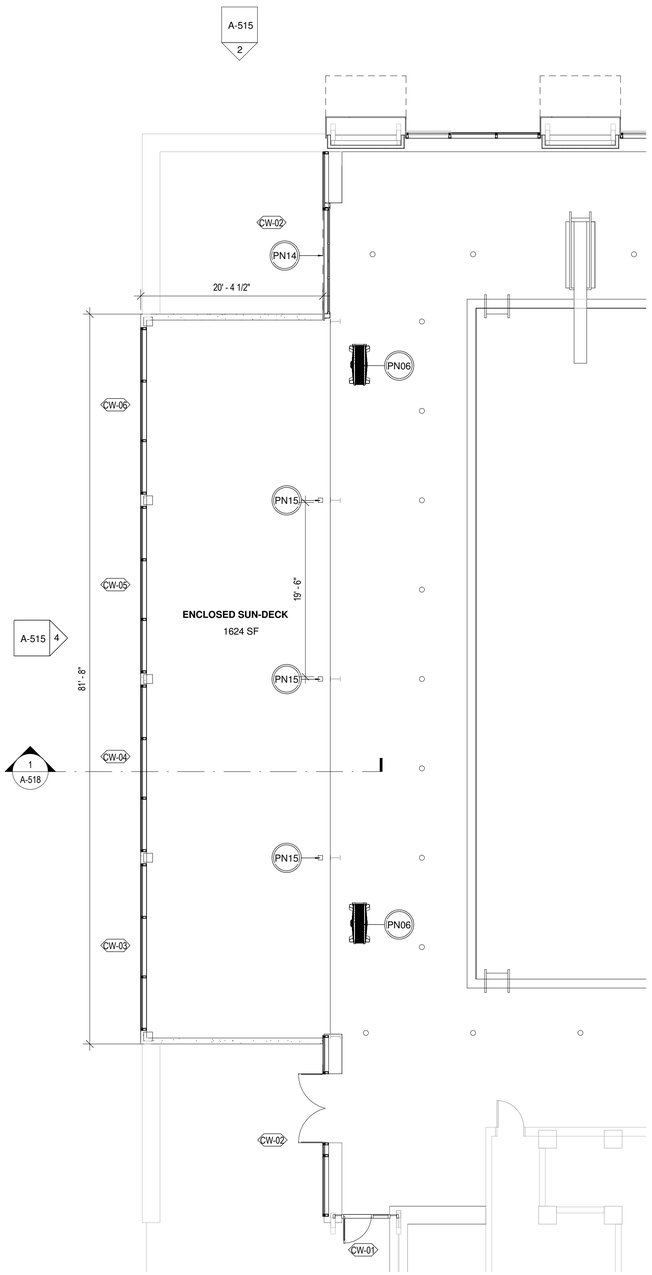
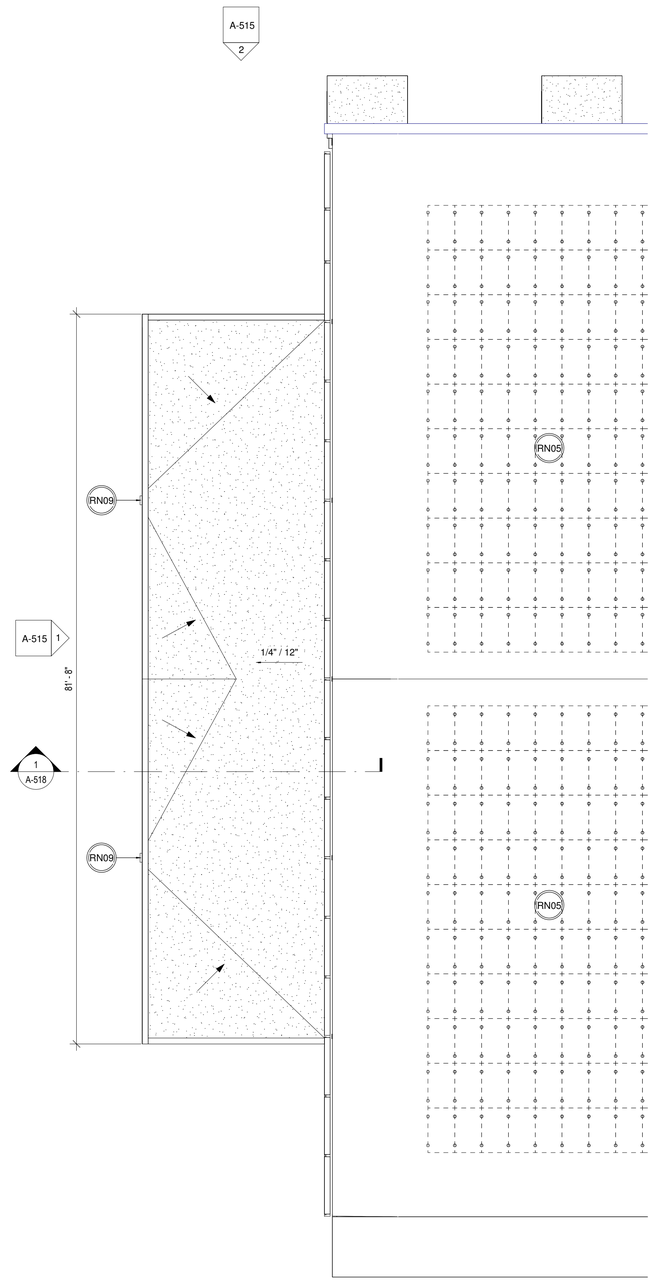


1 ENCLOSED SUN-DECK - FLOOR PLAN
1/8" = 1'-0"



2 ENCLOSED SUN-DECK - ROOF PLAN
1/8" = 1'-0"

GENERAL NOTES

1. HATCHED AREA NOT INCLUDED IN SCOPE OF WORK UNLESS OTHERWISE NOTED.
2. PROVIDE SUPPORT FOR WALL MOUNTED CABINETS AND PLUMBING FIXTURES. STEEL STUDS SUPPORTING WALL MOUNTED FIXTURES TO BE DOUBLED AT 16 O.C. OR NOT LESS THAN 20 GAUGE PER FBC 2517.5.1.1.
3. COMBUSTIBLE MATERIALS IN TYPES I & II CONSTRUCTION TO COMPLY WITH FBC 603.1 (FIRE RETARDANT - TREATED WOOD) AND 805.1 & 806.1
4. PROVIDE CEMENTITIOUS BACKER BOARD IN PLACE OF GWB AT ALL LOCATIONS SHOWING CERAMIC OR PORCELAIN TILE FINISH.
5. SEE SHEET ID100 - ID10X FOR FINISH PLANS.
6. SEE SHEET AX.X FOR PLAN DETAIL CALLOUTS.
7. SEE SHEET AX.X FOR PARTITION TYPE DETAILS. PROVIDE ACOUSTICAL BATT INSULATION WHERE INDICATED.
8. SEE SHEET AX.X FOR DIMENSION PLANS.
9. SEE SHEET AX.X FOR DOOR SCHEDULE.
10. SEE ENLARGED PLANS FOR ADDITIONAL WALL TAG INFORMATION.

TAG LEGEND

ELEMENT TAGS

Room name 101 — ROOM TAG

1001X — DOOR TAG

ST-X — STOREFRONT TAG

X 6 / X 6 — WALL TAG

XXX — SPECIALTY EQUIPMENT TAG

1t — FLOOR TAG

VIEW TAGS

Ref / 1 / A101 / 1 / Ref / 1 / Ref — EXTERIOR ELEVATION

1 Ref / Ref / A101 / Ref / 1 Ref — INTERIOR ELEVATION

SIM / 1 / A101 — SECTION MARK

SIM / 1 / A101 — VIEW CALLOUT

Name / Elevation — LEVEL HEAD

1'-0" / A.F.F — SPOT ELEVATION MARK

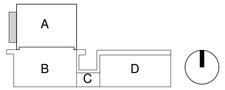
ANNOTATION TAGS

ALIGNMENT TAG — ALIGN

SPECIFIC NOTE TAG — XXX

SPECIFIC NOTES

TAG	NOTE
PN06	SIDEKICK BIG ASS FAN, PLUG-IN TYPE, PROPELLER STYLE ON WHEELS.
PN14	CROWN SST-II HYDRAULIC BI-FOLD DOOR SYSTEM.
PN15	6" SQ STEEL COLUMNS ADJACENT TO THE EXISTING STRUCTURE, ADDITION WOULD BE ITS OWN STRUCTURE.
RN05	PHOTOVOLTAIC ARRAY.
RN09	ROOF SCUPPER & DOWN SPOUT.



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LONG CENTER NATATORIUM

CITY OF CLEARWATER
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Project number
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DISTRIBUTION

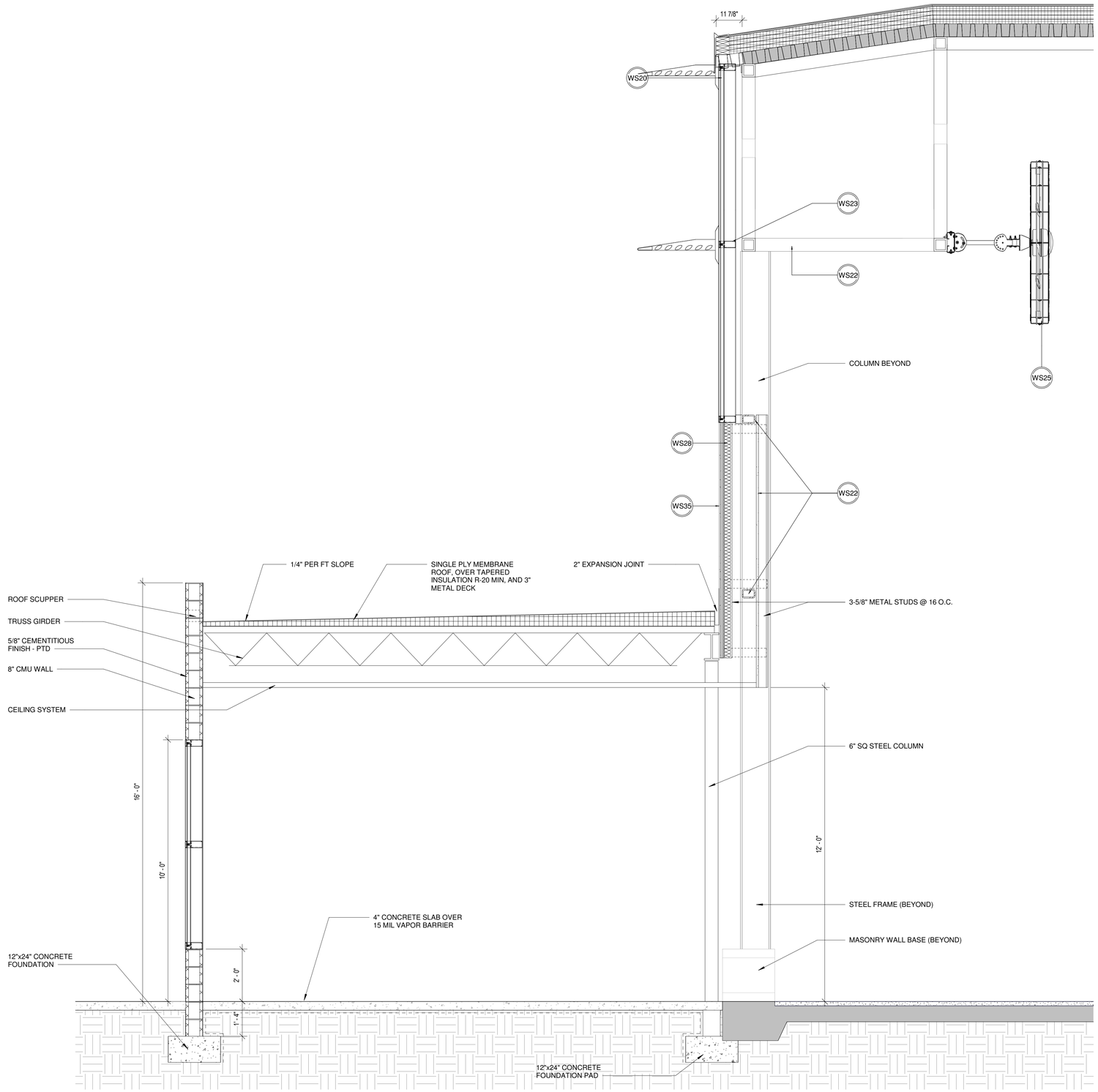
MILESTONE	DATE
SCHEMATIC BID SET	10.23.23

LEVEL 1 - FLOOR PLAN_ENCLOSED SUN-DECK_2B

A-517

SPECIFIC NOTES

TAG	NOTE
WS20	IMPACT RATED, INSULATED GLAZING CURTAIN WALL SYSTEM.
WS22	EXISTING STEEL TO BE REPAIRED AS NEEDED. REFER TO STRUCTURAL, SAND AND PAINT.
WS23	CURTAIN WALL FASTENED TO EXISTING HSS BEAMS, PER CURTAIN WALL MANUFACTURER.
WS25	SIDEWALL MOUNTED BIG ASS FAN, ADJUSTABLE PIVOT FAN.
WS28	FILL CAVITY WITH BATT INSULATION R-19.
WS35	1/2" SHEATHING, 1" RIGID INSULATION, STUCCO FINISH.



1 ENCLOSED SUN DECK SECTION
1/2" = 1'-0"

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DISTRIBUTION

MILESTONE	DATE
SCHEMATIC BID SET	10.23.23

ENCLOSED SUN-DECK ENLARGED PLAN & SECTION_2B

A-518

Appendix #2a - Cost Estimate

CC&A Construction Consultants & Associates

Project:	Long Center Renovations
Location:	Clearwater, Fl
Date:	12/19/2023
File Name:	Long Center Budget
Project #:	2023.116

Work Description	Qty	Unit	Lab unit $	Lab Tot	Mat unit $	Mat Tot	Sub unit $	Sub Tot	Total	Area Sub Total
BUILDING CONSTRUCTION - SCHEMATIC DESIGN BUDGET										
01 General Requirements										4,384,486
Contractor General Conditions	1	ls	15.0%			0	1324208.4	1324208	1,324,209	
Contractor General Liability Insurance	1	ls	2.0%			0	203045.3	203045	203,045	
Builder's Risk Insurance - By Owner							0			
Sub-Contractor Bonds	1	ls	2.5%			0	258882.7	258883	258,883	
Public Art Allowance - N.I.C.										
Estimate Contingency	1	ls	5.0%			0	1072033.5	1072033	1,072,034	
Escalation	1	ls	5.0%			0	589618.4	589618	589,618	
Permits Allowance	1	ls	1.0%			0	123819.9	123820	123,820	
Contractor General OH&P	1	ls	6.5%			0	812877.4	812877	812,877	
02 Existing Conditions										425,369
Asbestos Remediation - N.I.C.										
Selective Building Demolition										
Demo storefront 3070dr/hdw	2	ea		0		0	750.0	1500	1,500	
Demo storefront 6070dr/hdw	3	ea		0		0	1000.0	3000	3,000	
Demo glazing sys	16,071	sf		0		0	15.0	241062	241,062	
Demo pool trench drain	500	lf		0		0	100.0	50000	50,000	
Pool protection during demo	500	lf		0		0	25.0	12500	12,500	
Rem pool accessories	8	ea		0		0	1000.0	8000	8,000	
Demo SOG	240	sf		0		0	10.0	2400	2,400	
Demo CMU wall	120	sf		0		0	7.5	900	900	
Demo roof sys	27,383	sf		0		0	2.5	68457	68,457	
Demo roof curb	13	ea		0		0	250.0	3250	3,250	
Demo Mech equip	1	ls		0		0	25000.0	25000	25,000	
Demo Mech piping	300	lf		0		0	15.0	4500	4,500	
Cut-out metal deck	320	sf		0		0	15.0	4800	4,800	
03 Concrete										175,000
New pool gutter drain	500	lf		0		0	300.0	150000	150,000	
Slab on Grade with mesh - HVAC Chase	10	cy		0		0	2500.0	25000	25,000	
04 Masonry										10,000
Patch cmu walls	1	ls		0		0	10000.0	10000	10,000	
05 Metals										1,173,053

CC&A Construction Consultants & Associates

Project: Long Center Renovations
Location: Clearwater, Fl
Date: 12/19/2023
File Name: Long Center Budget
Project #: 2023.116

Work Description	Qty	Unit	Lab unit $	Lab Tot	Mat unit $	Mat Tot	Sub unit $	Sub Tot	Total	Area Sub Total
Sandblast steel structure	37,914	sf		0		0	5.5	208527	208,527	
Pool int floor area prot. during sandblastin	26,760	sf		0		0	2.5	66900	66,900	
Pool int clg area prot. during sandblasting	26,760	sf		0		0	3.5	93660	93,660	
Bldg ext area protection during sandblastir	15,279	sf		0		0	4.5	68756	68,756	
Roof extension stl plate/deck	446	lf		0		0	125.0	55750	55,750	
Tube steel framing - stl boxes	12	tn		0		0	6500.0	78000	78,000	
Tube steel framing - deck openings	5	tn		0		0	6500.0	32500	32,500	
Tube steel framing - mech equip	9	tn		0		0	6500.0	60938	60,938	
Tube steel posts - roof screen	7	tn		0		0	6500.0	42656	42,656	
Tube steel framing - OH door fr	0.67	tn		0		0	6500.0	4367	4,367	
Curtainwall attachment to stl fr	1.00	ls		0		0	25000.0	25000	25,000	
Structural steel repairs	1	ls		0		0	436000.0	436000	436,000	
06 Wood / Plastic / Composites										27,808
Rough Carpentry Work										
Roof Edge 2x Blocking	3,476	lf		0		0	8.0	27808	27,808	
07 Thermal & Moisture Protection										776,850
Insulation walls - Fiberglass 6" R19	10,030	sf		0		0	1.5	15045	15,045	
Roof Deck Insulation - Polyiso R20 min	31,050	sf		0		0	6.0	186300	186,300	
Gypsum cover bd 1/2"	31,050	sf		0		0	2.5	77625	77,625	
Tapered insulation bd	31,050	sf		0		0	2.5	77625	77,625	
Roofing - Single-ply TPO	31,050	sf		0		0	12.0	372600	372,600	
Walkway Pads	600	sf		0		0	5.0	3000	3,000	
Metal Flashings										
Pre-fin 2 piece metal fascia	983	lf		0		0	25.0	24585	24,585	
Sealants	26,760	sf		0		0	0.75	20070	20,070	
08 Openings										1,701,942
Entrances/Storefronts										
Alum Storefront doors - 6070	2	ea		0		0	7000.0	14000	14,000	
Alum Storefront doors - 3070	2	ea		0		0	5000.0	10000	10,000	
Al/Gl Curtainwall - impact rated	11,365	sf		0		0	145.0	1647942	1,647,942	
Special Doors										
Overhead Doors										
Hydraulic Bi-Fold Door	1	ea		0		0	25000.0	25000	25,000	
Access Doors/Panels										
Louver vents	20	ea		0		0	250.0	5000	5,000	
09 Finishes										1,010,808

CC&A Construction Consultants & Associates

Project: Long Center Renovations
Location: Clearwater, Fl
Date: 12/19/2023
File Name: Long Center Budget
Project #: 2023.116

Work Description	Qty	Unit	Lab unit $	Lab Tot	Mat unit $	Mat Tot	Sub unit $	Sub Tot	Total	Area Sub Total
Exterior Wall Finishes										
Stucco on framing, Painted	11,372	sf		0		0	18.0	204692	204,692	
Ext MS framing at stucco walls	11,372	sf		0		0	15.0	170577	170,577	
Interior Finishes										
Walls										
Ms 3 5/8"/MR gyp bd 1s	6,452	sf		0		0	12.0	77418	77,418	
Floors										
Porcelain Tile at pool edge 16"	771	sf		0		0	15.0	11558	11,558	
Epoxy Floor Coating - Pool Deck	11,615	sf		0		0	17.5	203263	203,263	
Wall Finishes										
Porcelain Tile at pool edge 8"	369	sf		0		0	15.0	5528	5,528	
Paint gyp bd, epoxy	6,452	sf		0		0	2.0	12903	12,903	
Ceiling Finishes										
Epxoy Paint steel framing/metal deck	64,974	sf		0		0	5.0	324870	324,870	
10 Specialties										457,650
Exterior Signs										
Letters - 12" Alum	10	ea		0		0	175.0	1750	1,750	
Letters - 18" Alum	10	ea		0		0	250.0	2500	2,500	
Misc.										
Bigass Fans - side mtd.	6	ea		0		0	12000.0	72000	72,000	
Sun Shades - Alum	1,000	lf		0		0	150.0	150000	150,000	
Equip. Screen wall	3,560	sf		0		0	65.0	231400	231,400	
11 Equipment										298,000
Pool Equip. - Replace UV system	1	ls		0		0	286000.0	286000	286,000	
Pool Equip. - Reinstall accessories	8	ea		0		0	1500.0	12000	12,000	
12 Furnishings										-
By Owner										
13 Special Construction										479,375
Enclosed Sundeck Addition	1,625	sf		0		0	295.0	479375	479,375	
14 Conveying Systems										-
None										
21 Fire Suppression System										-
None										

CC&A Construction Consultants & Associates

Project:	Long Center Renovations
Location:	Clearwater, Fl
Date:	12/19/2023
File Name:	Long Center Budget
Project #:	2023.116

Work Description	Qty	Unit	Lab unit $	Lab Tot	Mat unit $	Mat Tot	Sub unit $	Sub Tot	Total	Area Sub Total
22 Plumbing										9,000
Replace roof drains - same location	3	ea		0		0	3000.0	9000	9,000	
23 HVAC										1,942,200
Pool Dehumidifier & Fan	2	ea	258600	517,200.0	646500	1,293,000	25000	50,000	1,860,200	
Ductwork & support frames	1	ls	2000	2,000.0	5000	5,000	25000	25,000	32,000	
Test & Balance	1	ls		0		0	15000	15,000	15,000	
Controls	1	ls		0		0	25000	25,000	25,000	
HVAC Commissioning	1	ls		0		0	10000	10,000	10,000	
26 Electrical										341,000
Photovotaic System - Allowance	1	ls		0		0	300000	300,000	300,000	
HVAC power	1	ls		0		0	10000	10,000	10,000	
Building sigange power	1	ls		0		0	5000	5,000	5,000	
Ext wall lighting	10	ea		0		0	1850	18,500	18,500	
Tie into ex panel	1	ls		0		0	7500	7,500	7,500	
TOTAL BUILDING CONSTRUCTION PROBABLE COST - Option #1									**13,212,542**	**13,212,542**

The above budget does not include the following;
Site Work, Civil Work, Utilities
Pool Equipment
Equipment not specifically listed in the budget
Impact Fees
Testing & 3rd Party Inspections
Design Fees
Owner Contingency
Builder's Risk Insurance
Public Art

ALTERNATES

Option #2 - (less Al/Gl more soild wall)	DEDUCT	(330,184)
Pool Equipment - New High Rate Sand Filter sys	ADD	998,140
Pool Equipment - New Defender Filter sys	ADD	1,092,520

Appendix #2b - Cost Estimate

CONSTRUCTION COST ESTIMATE

Long Center Renovations

Schematic Bid Set

Estimate Prepared: 12/15/2023

PREPARED BY:

WJCreate CONSTRUCTION

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01 BASIS

ESTIMATORS APPROACH

PRELIMINARY ESTIMATE:

When approaching the task of developing a construction cost estimate WJCreate utilizes a variety of industry leading methods, tools, and technologies. We employ a combination of parametric data, assembly and systems costs, along with unit price and square foot calculations to develop a realistic probable cost model for the project's construction. Due to the limited detail of design documentation, which is typical of a project at this stage, numerous assumptions were made to develop an estimation that would reflect a complete project in line with what is understood to be the design intent.

For this estimate our estimating team collaborated with the project design team to provide technical input and fill in gaps where details were lacking or yet to be incorporated into the design documents. In parts of the estimate scopes were fairly well defined and measured to specific details in drawings while others may have been conceptualized by our estimating team. Costs assigned to items are estimated utilizing a combination of our experience with similar work and figures from our internal libraries of historical cost data, and values provided by industry leading resources like R.S. Means and BNI.

Supplemental information was obtained by consultants hired by the Architect and their information is included in part of this estimate.

ESTIMATOR'S CONTINGENCY

While our estimating team takes numerous steps to fill in the gaps in the design documents it is not always possible to foresee every detail. The "Estimators Contingency" included within this estimate is intended to provide safeguard from costs associated with design-related uncertainties that exist at the time the estimate is being provided. The Estimator's Contingency is based on the level of detail provided by the design documents and the number of assumptions taken by the estimating team.

QUALIFICATION:

This opinion of probable costs of construction is provided based on company staff experience, qualifications, and best judgment. WJCreate has prepared this estimate in accordance with generally accepted cost estimating practices and standards. WJCreate reserves the right to amend our opinions based upon new and/or differing information discovered.

02 DOCUMENTS

The listed documents below were utilized in the development of the cost estimate provided herein.

SHEET #	SHEET NAME	SD BID PACKAGE
01 GENERAL		
G-100	COVER_OPT 1	●
G-101	DRAWING LEGEND AND BUILDING DATA	●
G-103	SHEET INDEX_OPT 1	
06 DEMO		
AD-301	DEMO FLOOR PLAN	●
AD-302	DEMO ROOF PLAN	●
AD-303	DEMO EXTERIOR ELEVATIONS	●
AD-304	DEMO EXTERIOR ELEVATIONS	●
07 ARCHITECTURAL		
A-002	3D VIEWS_OPT 1	●
A-003	RENDERINGS OPT_1	●
A-101	LEVEL 1 - FLOOR PLAN_OPT 1	●
A-102	ROOF PLAN_OPT 1	●
A-201	REFLECTED CEILING PLAN	●
A-303	EXTERIOR ELEVATIONS_OPT 1	●
A-304	EXTERIOR ELEVATIONS_OPT 1	●
A-410	EXTERIOR TRUSS PLANS, ELEVATIONS & SECTION_OPT 1	●
A-412	VENTILATION TOWERS_OPT 1	●
A-413	WALL SECTIONS_OPT 1	●
A-501	COVER_OPT 2	●
A-502	3D VIEWS_OPT 2	●
A-503	RENDERINGS OPT_2	●
A-504	LEVEL 1 - FLOOR PLAN_OPT 2	●
A-505	ROOF PLAN_OPT 2	●
A-506	EXTERIOR ELEVATIONS_OPT 2	●
A-507	EXTERIOR ELEVATIONS_OPT 2	●
A-508	EXTERIOR TRUSS PLANS, ELEVATIONS & SECTION_OPT 2	●
A-509	VENTILATION TOWERS_OPT 2	●
A-510	WALL SECTIONS_OPT 2	●

SUNDECK

SHEET #	SHEET NAME	SD BID PACKAGE
01 GENERAL		
G-105	COVER_ENCLOSED SUN-DECK_2B	●
G-106	SHEET INDEX_ENCLOSED SUN-DECK_2B	
06 DEMO		
AD-101	DEMO FLOOR PLAN_ENCLOSED SUN-DECK	●
07 ARCHITECTURAL		
A-515	ENCLOSED SUN-DECK WEST ELEVATION_2B	●
A-516	RENDERINGS ENCLOSED SUN-DECK_2B	●
A-517	LEVEL 1 - FLOOR PLAN_ENCLOSED SUN-DECK_2B	●
A-518	ENCLOSED SUN-DECK ENLARGED PLAN & SECTION_2B	●

03 NARRATIVE

The following narrative is intended to provide additional information and clarification for the line items listed within the estimate.

GENERAL ITEMS

1. The estimate includes two potential renovations schemes.
2. Cost Model is based upon design documents listed herein.
3. No Structural, Mechanical, Electrical or Plumbing drawings provided. All costs are conceptualized figures based on assembly systems typical of the scope of work.
4. The estimate is based on current market costs at the time the estimate was prepared and work being performed during normal business hours at a typical pace.
5. Estimate does not include amounts associated with the replacement of Pool Equipment.

GENERAL EXCLUSIONS

The items below are not included in this estimate unless specifically called out as included:

1. Permitting costs or any other municipal fees.
2. Professional design services and engineering service fees.

OPTION ONE

01 – GENERAL CONDITIONS:

- All general conditions assume an overall 8-month construction timeline.
- Project Management assumes (1) Full-time Superintendent and (1) Part-time Project Manager.
- All other items typical of a project of this nature.

02 – EXISTING CONDITIONS

- Estimate includes all demolition as noted on drawings.
- Amount allocated for protection for Pool
- Conceptualized demolition items include:
    - Landscape Demolition.
    - Demolition of slab for Duct Chase.
    - Pool Edge demolition for Drain Replacement.
    - Demolition and removal of existing HVAC equipment.
    - Demolition and removal of pool equipment.

03 – CONCRETE

- Includes cost for foundation of the duct chase and an allowance for misc. concrete and masonry repair.

05 – METALS

- No Structural Drawings provided. All amounts provided are conceptualized amounts.
- Estimate for Structural Steel Modification components provided by Architect's Structural Consultant.

07 – THERMAL AND MOISTURE PROTECTIONS

- Roof system to be replaced from deck up per drawing specifications.
- Insulation and weather barrier systems included is wall assembly costs.
- A misc. caulking/waterproofing line item included.

08 – OPENINGS

- New Curtain wall system priced as specified by Architect.
    - Includes YKK (YHC 300 OG) system and 1-5/16" VNE1-53 Insulating Laminated Glazing.
    - Therma Shade System Included where indicated.

09 – FINISHES

- Metal Truss framing system assembly priced as specified in the drawings.
- Allowance included for preparation of existing floors
- Sandblasting of existing ceilings included.

22 – PLUMBING

- No plumbing drawings provided. All amounts provided are conceptualized amounts.

23 – HVAC

- No HVAC drawings provided. All amounts provided are conceptualized amounts.
- HVAC Systems costs included per Engineer's quote.
- An Additional line item included for installation of equipment and other necessities.

26 – ELECTRICAL

- No Electrical drawings provided. All amounts provided are conceptualized amounts.

35 – WATERWAY & MARINE

- Estimate includes pool equipment per Counsilman – Hunsaker Estimate.
- An allowance included for miscellaneous pool repair.

48 – ELECTRICAL POWER GENERATION

- A conceptualized amount is provided for a photovoltaic array system. These systems vary drastically in cost depending on the system specified. The amount assigned is based on a 171 kW System to occupy the areas indicated on the roof drawings.

LONG CENTER RENOVATIONS

ESTIMATE OF PROBABLE CONSTRUCTION COST

SCHEMATIC BID SET (10/23/23)

ESTIMATE PREPARED: 12/15/2023

	OPTION ONE			OPTION TWO			SUN DECK		
DIVISION / DESCRIPTION	$	% OF TOTAL	$/SF	$	% OF TOTAL	$/SF	$	% OF TOTAL	$/SF
01 GENERAL REQUIREMENTS	789,527	8%	$31	751,546	9%	$30	143,138	20%	$84
02 EXISTING CONDITIONS	271,997	3%	$11	271,997	3%	$11	20,825	3%	$12
03 CONCRETE	25,400	0%	$1	25,400	0%	$1	45,048	6%	$26
04 MASONRY	-	0%	$0	-	0%	$0	47,824	7%	$28
05 METALS	1,015,846	10%	$40	1,015,846	12%	$40	66,671	9%	$39
07 THERMAL AND MOISTURE PROTECTIONS	550,122	5%	$22	550,122	6%	$22	53,488	8%	$31
08 OPENINGS	3,408,110	33%	$134	1,507,750	18%	$60	114,432	16%	$67
09 FINISHES	769,192	7%	$30	1,053,363	12%	$42	89,147	13%	$52
10 SPECIALTIES	32,000	0%	$1	32,000	0%	$1	-	0%	$0
22 PLUMBING	55,179	1%	$2	55,179	1%	$2	-	0%	$0
23 HVAC	1,603,415	16%	$63	1,603,415	19%	$63	-	0%	$0
26 ELECTRICAL	156,100	2%	$6	156,100	2%	$6	35,100	5%	$21
31 EARTHWORK	-	0%	$0	-	0%	$0	11,260	2%	$7
32 EXTERIOR IMPROVEMENTS	20,000	0%	$1	20,000	0%	$1	8,000	1%	$5
35 WATERWAY & MARINE	370,852	4%	$15	370,852	4%	$15	-	0%	$0
48 ELECTRICAL POWER GENERATION	468,000	5%	$18	468,000	5%	$18	-	0%	$0
00 PROCUREMENT & CONTRACTING	808,506	8%	$32	676,172	8%	$27	68,714	10%	$40
SUBTOTAL	**$ 10,344,246**		$408	**$ 8,557,743**		$338	**$ 703,647**		$414
Estimator's Contingency	827,540	8%	$33	684,619	8%	$27	56,292	8%	$33
GRAND TOTAL:	**$ 11,171,785**		$441	**$ 9,242,362**		$365	**$ 759,939**		$447

Pool Equipment Alternatives

UV System Replacements	Included in Base Estimate	
Recirculation Systems Replacement - High Rate Sand Filters (Add)	+	714,820
Recirculation Systems Replacement - Defeinder Filter System (Add)	+	829,330

OPTION 1

LONG CENTER RENOVATIONS

MAS	ITEM	DESCRIPTION		UOM		COST		TOTAL
	02. EXISTING CONDITIONS							
	Selective Demolition							
	Doors & Openings	D002	3	EA	x	$198.00	=	**$594**
	Glazing Systems	D011	15,458	SF	x	$4.75	=	**$73,426**
	Pool Edge Trench Drain	D012	494	LF	x	$22.45	=	**$11,090**
	Pool Equipment		1	LSUM	x	$6,250.00	=	**$6,250**
	Pool Specialties	D017	1	LSUM	x	$1,250.00	=	**$1,250**
	Roofing Systems Demolition	To Deck, Including Curbs & Edge	27,250	SF	x	$1.48	=	**$40,194**
	Minor Site Demolition							
	Exterior Hardscape Selective Demolition	D021	1	SF	x	$2,650.00	=	**$2,650**
	Landscaping Demolition		1	LSUM	x	$4,800.00	=	**$4,800**
	Service System Demolition							
	HVAC Systems & Components Demolition	All Existing Mechanical Equipment	1	LSUM	x	$28,250.00	=	**$28,250**
	Protection & Controls							
	Scaffolding	False Deck in Pool to Ceiling	1	LSUM	x	$80,000.00	=	**$80,000**
	Temporary Protection	Misc. Protection for Existing to Remain and WIP	1	LSUM	x	$8,750.00	=	**$8,750**
	Pool Cover	Temporary Pool Cover - Poly Tarp	12,820	SF	x	$1.15	=	**$14,743**
02	***SUBTOTAL - EXISTING CONDITIONS***							**$271,997**
	03. CONCRETE							
	Foundation Systems							
	Concrete Foundations	Foundations @ Duct Chase	320	SF	x	$32.50	=	**$10,400**
	Concrete Patching							
	Concrete & Masonry Patching	Allowance - Misc. repair of existing walls as needed	1	LSUM	x	$15,000.00	=	**$15,000**
03	***SUBTOTAL - CONCRETE***							**$25,400**
	05. METALS							
	Structural Steel Systems							
	Existing Systems Modifications							
	Metal Truss Modifciations	Estimate Provided by Structural Consultants	1	LSUM	x	$453,440.00	=	**$453,440**
	HVAC RTU Equipment Supports	Estimate Provided by Structural Consultants	1	LSUM	x	$241,620.00	=	**$241,620**
	Roofing Modifications	Estimate Provided by Structural Consultants	1	LSUM	x	$51,510.00	=	**$51,510**
	HVAC Chase(s)	Estimate Provided by Structural Consultants	1	LSUM	x	$87,326.00	=	**$87,326**
	Other Metals							
	Roof Screen	Louvered metal screens @ Mech	3,600	SF	x	$42.50	=	**$153,000**
	Metal Louvers	Ventilation louvers on truss walls	30	EA	x	$965.00	=	**$28,950**
05	***SUBTOTAL - METALS***							**$1,015,846**
	07. THERMAL AND MOISTURE PROTECTIONS							
	Roofing Systems							
	Rigid Insulation	Polyiso Rigid Insulation	27,690	SF	x	$8.15	=	**$225,674**
	Coverboard	1/2"	27,690	SF	x	$1.45	=	**$40,151**
	Membrane	60 Mil Single Ply TPO	27,690	SF	x	$7.36	=	**$203,798**
	Roof Edge	Blocking & Metal Flashing	720	LF	x	$81.25	=	**$58,500**
	Waterproofing & Caulking	Misc. Waterproofing & Caulking	1	LSUM	x	$22,000.00	=	**$22,000**
07	***SUBTOTAL - WOODS & PLASTICS***							**$550,122**
	08. OPENINGS							
	Doors							
	Storefront Door System		2	EA	x	$9,250.00	=	**$18,500**
	Bi-Fold Door System		1	EA	x	$19,250.00	=	**$19,250**
	Exterior Glazing Systems							
	Curtain Wall system							
	YKK Curtain Wall System	YKK System	11,018	SF	x	$300.00	=	**$3,305,400**
	Awning Systems	Therma Shade System @ Curtain Wall	580	LF	x	$112.00	=	**$64,960**
08	***SUBTOTAL - OPENINGS***							**$3,408,110**

OPTION 1

LONG CENTER RENOVATIONS

MAS	ITEM	DESCRIPTION		UOM		COST		TOTAL
	09. FINISHES							
	Wall Assembly Systems							
	Framing	Metal Studs & Clips	10,935	SF	x	$8.28	=	**$90,542**
	Sheathing	Exterior Gyp Board	10,935	SF	x	$6.74	=	**$73,702**
	Insulation	Batt & Rigid Insulation	4,830	SF	x	$3.25	=	**$15,698**
	Stucco Systems	3 Coat Stucco only Ply inc. VB	10,935	SF	x	$9.15	=	**$100,055**
	Paint	Paint on Stucco & Gyp	15,765	SF	x	$2.15	=	**$33,895**
	Gypsum Board	5/8 Moisture Resistant Gyp	4,830	SF	x	$3.10	=	**$14,973**
	Wall Finishes							
	Paint / Epoxy Painting	Existing Structural Steel Systems	1	LSUM	x	$18,748.75	=	**$18,749**
	Floor Finishes							
	Floor Preparation	Prepare Pool Deck for Epoxy	11,040	SF	x	$2.15	=	**$23,736**
	Epoxy Flooring Systems	Pool Deck	11,040	SF	x	$12.48	=	**$137,779**
	Ceiling Finishes							
	Sand Blasting	Interior Ceiling	25,200	SF	x	$4.32	=	**$108,864**
	Paint / Epoxy Painting	Structural Beams & Deck	25,200	SF	x	$6.00	=	**$151,200**
09	***SUBTOTAL - FINISHES***							**$769,192**
	10. SPECIALTIES							
	Signage							
	Backlight Marquee Signage	Wall Mounted	1	LSUM	x	$32,000.00	=	**$32,000**
10	***SUBTOTAL - SPECIALTIES***							**$32,000**
	22. PLUMBING							
	Sanitary Specialties							
	Roof Drain Pipe	Replace Existing Systems	480	LF	x	$108.80	=	**$ 52,224.00**
	Roof Drain		3	EA	x	$985.00	=	**$ 2,955.00**
22	***SUBTOTAL - PLUMBING***							**$55,179**
	23. HVAC							
	HVAC Systems							
	HVAC Equipment	Per Engineer's Quote	1	lsum	x	$1,293,000.00	=	**$1,293,000**
	HVAC Installation & Other Materials		1	lsum	x	$310,415.00	=	**$310,415**
23	***SUBTOTAL - HVAC SYSTEMS***							**$1,603,415**
	26. ELECTRICAL							
	Electrical Service & Distribution							
	Electrical Systems	Fixtures & Signage Connection - Wiring, Conduit, Etc.	1	LSUM	x	$124,250.00	=	**$124,250**
	Lighting & Fixtures							
	Exterior Light Fixtures		10	EA	x	$1,850.00	=	**$18,500**
	Pivot Fans		6	EA	x	$2,225.00	=	**$13,350**
26	***SUBTOTAL - ELECTRICAL SYSTEMS***							**$156,100**
	32. EXTERIOR IMPROVEMENTS							
	Landscaping & Irrigation							
	Landscaping	Landscaping Allowance	1	LSUM	x	$20,000.00	=	**$20,000**
32	***SUBTOTAL - EXTERIOR IMPROVEMENTS***							**$20,000**
	35. WATERWAY & MARINE							
	Pool Equipment & Specialties							
	Pool Equipment	Cost Provided by Pool Consultant	1	LSUM	x	$286,000.00	=	**$286,000**

OPTION 1

LONG CENTER RENOVATIONS

MAS	ITEM	DESCRIPTION		UOM		COST		TOTAL
	Pool Edge - Trench Drain Curb	Natare Grating	494	LF	x	$131.28	=	**$64,852**
	Pool Repair	Pool Repair Allowance	1	LSUM	x	$20,000.00	=	**$20,000**
35	***SUBTOTAL - WATERWAY & MARINE***							**$370,852**
	48. ELECTRICAL POWER GENERATION							
	Solar Power Generating Systems							
	Photovoltaic Array System	171 kW System	1	LSUM	x	$468,000.00	=	**$468,000**
48	***SUBTOTAL - ELECTRICAL POWER GENERATION***							**$468,000**
	01. GENERAL REQUIREMENTS							
	Project Management							
	Project Supervision							
	Project Manager(s) Time	(1) Project Manager(s)	8	MTH	x	$11,088.00	=	**$88,704**
	Assistant Project Manager(s) Time	(1) Assistant Project Manager(s)	8	MTH	x	$14,300.00	=	**$114,400**
	Project Accountant(s)	(1) Project Accountant	8	MTH	x	$600.00	=	**$4,800**
	Software	Project Management Software & Cloud Services	8	MTH	x	$1,850.00	=	**$14,800**
	Field Supervision							
	Project Site Superintendent	(1) Site Superintendent(s)	8	MTH	x	$16,800.00	=	**$134,400**
	Assistant Superintendent	(1) Site Assistant Superintendent(s)	8	MTH	x	$14,800.00	=	**$118,400**
	Field Office & Supplies							
	Site Office & Equipment	Jobsite Trailer & Office Supplies	8	MTH	x	$2,845.00	=	**$22,760**
	Temporary Toilets		8	MTH	x	$750.00	=	**$6,000**
	Field Office Supplies		8	MTH	x	$215.00	=	**$1,720**
	Maintenance & Housekeeping							
	Jobsite Clean-up	Temp Labor / Clean-up	8	MTH	x	$1,750.00	=	**$14,000**
	Temporary Controls & Safety							
	Safety Supplies		1	LSUM	x	$1,200.00	=	**$1,200**
	Site Signage		1	LSUM	x	$2,000.00	=	**$2,000**
	Construction Aids, Equipment, & Tools							
	Equipment Rentals		1	LSUM	x	$10,000.00	=	**$10,000**
	Punchlist Allowance		1	LSUM	x	$3,500.00		**$3,500**
	Trash and Dump Charges							
	Dumpster & Trash Removal Charges		25,340	SF	x	$0.95	=	**$24,073**
	Testing and Quality Control							
	Quality Control	Quality Control Manager	1	LSUM	x	$9,825.00	=	**$9,825**
	SUBTOTAL - COST OF WORK							**$9,316,795**
	Cascading Costs							
	General Liability Insurance		Cost of Work		x	1.00%	=	**$93,168**
	Builder's Risk Insurance		Cost of Work		x	0.35%	=	**$32,609**
	Bonds		Cost of Work		x	1.00%	=	**$93,168**
01	***SUBTOTAL - GENERAL REQUIREMENTS***							**$789,527**
	00. PROCUREMENT & CONTRACTING							
	Fees & Overhead							
	Contractor's Fee		Cost of Work		x	5.00%	=	**$505,316**
	Construction Contingency		Cost of Work		x	3.00%	=	**$303,190**
00	***SUBTOTAL - CONTRACTOR'S FEE & CONTINGENCY***							**$808,506**
	PROJECT TOTAL							**$10,344,246**

OPTION 2

LONG CENTER RENOVATIONS

MAS	ITEM	DESCRIPTION		UOM		COST		TOTAL
	02. EXISTING CONDITIONS							
	Selective Demolition							
	Doors & Openings	D002	3	EA	x	$198.00	=	**$594**
	Glazing Systems	D011	15,458	SF	x	$4.75	=	**$73,426**
	Pool Edge Trench Drain	D012	494	LF	x	$22.45	=	**$11,090**
	Pool Equipment		1	LSUM	x	$6,250.00	=	**$6,250**
	Pool Specialties	D017	1	LSUM	x	$1,250.00	=	**$1,250**
	Roofing Systems Demolition	To Deck, Including Curbs & Edge	27,250	SF	x	$1.48	=	**$40,194**
	Minor Site Demolition							
	Exterior Hardscape Selective Demolition	D021	1	SF	x	$2,650.00	=	**$2,650**
	Landscaping Demolition		1	LSUM	x	$4,800.00	=	**$4,800**
	Service System Demolition							
	HVAC Systems & Components Demolition	All Existing Mechanical Equipment	1	LSUM	x	$28,250.00	=	**$28,250**
	Protection & Controls							
	Scaffolding	False Deck in Pool to Ceiling	1	LSUM	x	$80,000.00	=	**$80,000**
	Temporary Protection	Misc. Protection for Existing to Remain and WIP	1	LSUM	x	$8,750.00	=	**$8,750**
	Pool Cover	Temporary Pool Cover - Poly Tarp	12,820	SF	x	$1.15	=	**$14,743**
02	***SUBTOTAL - EXISTING CONDITIONS***							**$271,997**
	03. CONCRETE							
	Foundation Systems							
	Concrete Foundations	Foundations @ Duct Chase	320	SF	x	$32.50	=	**$10,400**
	Concrete Patching							
	Concrete & Masonry Patching	Misc. repair of existing walls as needed	1	LSUM	x	$15,000.00	=	**$15,000**
03	***SUBTOTAL - CONCRETE***							**$25,400**
	05. METALS							
	Structural Steel Systems							
	Existing Systems Modifications							
	Metal Truss Modifciations	Estimate Provided by Structural Consultants	1	LSUM	x	$453,440.00	=	**$453,440**
	HVAC RTU Equipment Supports	Estimate Provided by Structural Consultants	1	LSUM	x	$241,620.00	=	**$241,620**
	Roofing Modifications	Estimate Provided by Structural Consultants	1	LSUM	x	$51,510.00	=	**$51,510**
	HVAC Chase(s)	Estimate Provided by Structural Consultants	1	LSUM	x	$87,326.00	=	**$87,326**
	Other Metals							
	Roof Screen	Louvered metal screens @ Mech	3,600	SF	x	$42.50	=	**$153,000**
	Metal Louvers	Ventilation louvers on truss walls	30	EA	x	$965.00	=	**$28,950**
05	***SUBTOTAL - METALS***							**$1,015,846**
	07. THERMAL AND MOISTURE PROTECTIONS							
	Roofing Systems							
	Rigid Insulation	Polyiso Rigid Insulation	27,690	SF	x	$8.15	=	**$225,674**
	Coverboard	1/2"	27,690	SF	x	$1.45	=	**$40,151**
	Membrane	60 Mil Single Ply TPO	27,690	SF	x	$7.36	=	**$203,798**
	Roof Edge	Blocking & Metal Flashing	720	LF	x	$81.25	=	**$58,500**
	Waterproofing & Caulking	Misc. Waterproofing & Caulking	1	LSUM	x	$22,000.00	=	**$22,000**
07	***SUBTOTAL - WOODS & PLASTICS***							**$550,122**
	08. OPENINGS							
	Doors							
	Storefront Door System		2	EA	x	$9,250.00	=	**$18,500**
	Bi-Fold Door System		1	EA	x	$19,250.00	=	**$19,250**
	Exterior Glazing Systems							
	Curtain Wall system							
	YKK Curtain Wall System	YKK System	4,900	SF	x	$300.00	=	**$1,470,000**
08	***SUBTOTAL - OPENINGS***							**$1,507,750**

OPTION 2

LONG CENTER RENOVATIONS

MAS	ITEM	DESCRIPTION		UOM		COST		TOTAL
	09. FINISHES							
	Wall Assembly Systems							
	Framing	Metal Studs & Clips	17,595	SF	x	$8.28	=	**$145,687**
	Sheathing	Exterior Gyp Board	17,595	SF	x	$6.74	=	**$118,590**
	Insulation	Batt & Rigid Insulation	11,710	SF	x	$3.25	=	**$38,058**
	Stucco Systems	3 Coat Stucco only Ply inc. VB	17,595	SF	x	$9.15	=	**$160,994**
	Paint	Paint on Stucco & Gyp	29,305	SF	x	$2.15	=	**$63,006**
	Gypsum Board	5/8 Moisture Resistant Gyp	11,710	SF	x	$3.10	=	**$36,301**
	Wall Finishes							
	Paint / Epoxy Painting	Existing Structural Steel Systems	1	LSUM	x	$18,748.75	=	**$18,749**
	Floor Finishes							
	Floor Preparation	Prepare Pool Deck for Epoxy	11,040	SF	x	$2.15	=	**$23,736**
	Epoxy Flooring Systems	Pool Deck	11,040	SF	x	$12.48	=	**$137,779**
	Ceiling Finishes							
	Sand Blasting	Interior Ceiling	25,200	SF	x	$4.32	=	**$108,864**
	Paint / Epoxy Painting	Structural Beams & Deck	25,200	SF	x	$8.00	=	**$201,600**
09	***SUBTOTAL - FINISHES***							**$1,053,363**
	10. SPECIALTIES							
	Signage							
	Backlight Marquee Signage	Wall Mounted	1	LSUM	x	$32,000.00	=	**$32,000**
10	***SUBTOTAL - SPECIALTIES***							**$32,000**
	22. PLUMBING							
	Sanitary Specialties							
	Roof Drain Pipe	Replace Existing Systems	480	LF	x	$108.80	=	**$ 52,224.00**
	Roof Drain		3	EA	x	$985.00	=	**$ 2,955.00**
22	***SUBTOTAL - PLUMBING***							**$55,179**
	23. HVAC							
	HVAC Systems							
	HVAC Equipment	Per Engineer's Quote	1	lsum	x	$1,293,000.00	=	**$1,293,000**
	HVAC Installation & Other Materials		1	lsum	x	$310,415.00	=	**$310,415**
23	***SUBTOTAL - HVAC SYSTEMS***							**$1,603,415**
	26. ELECTRICAL							
	Electrical Service & Distribution							
	Electrical Systems	Fixtures & Signage Connection - Wiring, Breakers, Etc.	1	LSUM	x	$124,250.00	=	**$124,250**
	Lighting & Fixtures							
	Exterior Light Fixtures		10	EA	x	$1,850.00	=	**$18,500**
	Pivot Fans		6	EA	x	$2,225.00	=	**$13,350**
26	***SUBTOTAL - ELECTRICAL SYSTEMS***							**$156,100**
	32. EXTERIOR IMPROVEMENTS							
	Landscaping & Irrigation							
	Landscaping	Landscaping Allowance	1	LSUM	x	$20,000.00	=	**$20,000**
32	***SUBTOTAL - EXTERIOR IMPROVEMENTS***							**$20,000**
	35. WATERWAY & MARINE							
	Pool Equipment & Specialties							
	Pool Equipment	Cost Provided by Pool Consultant	1	LSUM	x	$286,000.00	=	**$286,000**
	Pool Edge - Trench Drain Curb	Natare Grating - Includes Install	494	LF	x	$131.28	=	**$64,852**

OPTION 2

LONG CENTER RENOVATIONS

MAS	ITEM	DESCRIPTION		UOM		COST		TOTAL
	Pool Repair	Pool Repair Allowance	1	LSUM	x	$20,000.00	=	**$20,000**
35	***SUBTOTAL - WATERWAY & MARINE***							**$370,852**
	48. ELECTRICAL POWER GENERATION							
	Solar Power Generating Systems							
	Photovoltaic Array System	171 kW System	1	LSUM	x	$468,000.00	=	**$468,000**
48	***SUBTOTAL - ELECTRICAL POWER GENERATION***							**$468,000**
	01. GENERAL REQUIREMENTS							
	Project Management							
	Project Supervision							
	Project Manager(s) Time	(1) Project Manager(s)	8	MTH	x	$11,088.00	=	**$88,704**
	Assistant Project Manager(s) Time	(1) Assistant Project Manager(s)	8	MTH	x	$14,300.00	=	**$114,400**
	Project Accountant(s)	(1) Project Accountant	8	MTH	x	$600.00	=	**$4,800**
	Software	Project Management Software & Cloud Services	8	MTH	x	$1,850.00	=	**$14,800**
	Field Supervision							
	Project Site Superintendent	(1) Site Superintendent(s)	8	MTH	x	$16,800.00	=	**$134,400**
	Assistant Superintendent	(1) Site Assistant Superintendent(s)	8	MTH	x	$14,800.00	=	**$118,400**
	Field Office & Supplies							
	Site Office & Equipment	Jobsite Trailer & Office Supplies	8	MTH	x	$2,845.00	=	**$22,760**
	Temporary Toilets		8	MTH	x	$750.00	=	**$6,000**
	Field Office Supplies		8	MTH	x	$215.00	=	**$1,720**
	Maintenance & Housekeeping							
	Jobsite Clean-up	Temp Labor / Clean-up	8	MTH	x	$1,750.00	=	**$14,000**
	Temporary Controls & Safety							
	Safety Supplies		1	LSUM	x	$1,200.00	=	**$1,200**
	Site Signage		1	LSUM	x	$2,000.00	=	**$2,000**
	Construction Aids, Equipment, & Tools							
	Equipment Rentals		1	LSUM	x	$10,000.00	=	**$10,000**
	Punchlist Allowance		1	LSUM	x	$3,500.00		**$3,500**
	Trash and Dump Charges							
	Dumpster & Trash Removal Charges		25,340	SF	x	$0.95	=	**$24,073**
	Testing and Quality Control							
	Quality Control	Quality Control Manager	1	LSUM	x	$9,825.00	=	**$9,825**
	SUBTOTAL - COST OF WORK							**$7,700,606**
	Cascading Costs							
	General Liability Insurance		Cost of Work		x	1.00%	=	**$77,006**
	Builder's Risk Insurance		Cost of Work		x	0.35%	=	**$26,952**
	Bonds		Cost of Work		x	1.00%	=	**$77,006**
01	***SUBTOTAL - GENERAL REQUIREMENTS***							**$751,546**
	00. PROCUREMENT & CONTRACTING							
	Fees & Overhead							
	Contractor's Fee		Cost of Work		x	5.00%	=	**$422,608**
	Construction Contingency		Cost of Work		x	3.00%	=	**$253,565**
00	***SUBTOTAL - CONTRACTOR'S FEE & CONTINGENCY***							**$676,172**
	PROJECT TOTAL							**$8,557,743**

SUN DECK

LONG CENTER RENOVATIONS

MAS	ITEM	DESCRIPTION		UOM		COST		TOTAL
	02. EXISTING CONDITIONS							
	Selective Demolition							
	Foundations		1,700	SF	x	$6.15	=	**$10,455**
	Steel Demolition		1	LSUM	x	$3,200.00	=	**$3,200**
	Fence Demolition		145	LF	X	$6.00	=	**$870**
	Minor Site Demolition							
	Landscaping Demolition		1	LSUM	x	$1,800.00	=	**$1,800**
	Protection & Controls							
	Temporary Protection	Misc. Protection for Existing to Remain and WIP	1	LSUM	x	$4,500.00	=	**$4,500**
02	***SUBTOTAL - EXISTING CONDITIONS***							**$20,825**
	03. CONCRETE							
	Foundation Systems							
	Concrete Foundations	Foundations	205	LF	x	$78.50	=	**$16,093**
	Slab on Grade		1,700	SF	x	$11.15	=	**$18,955**
	Concrete Patching							
	Concrete & Masonry Patching	Misc. repair of existing walls as needed	1	LSUM	x	$10,000.00	=	**$10,000**
03	***SUBTOTAL - CONCRETE***							**$45,048**
	04. MASONRY							
	Wall Assembly							
	CMU		1,952	SF	x	$24.50	=	**$47,824**
04	***SUBTOTAL - MASONRY***							**$47,824**
	05. METALS							
	Structural Steel Systems							
	Steel Joists & Metal Decking		1,700	SF	x	$21.50	=	**$36,550**
	Structural Components	Columns & Beams	182	LF	x	$165.50	=	**$30,121**
05	***SUBTOTAL - METALS***							**$66,671**
	07. THERMAL AND MOISTURE PROTECTIONS							
	Roofing Systems							
	Rigid Insulation	Polyiso Rigid Insulation	1,700	SF	x	$8.15	=	**$13,855**
	Coverboard	1/2"	1,700	SF	x	$1.45	=	**$2,465**
	Membrane	60 Mil Single Ply TPO	1,700	SF	x	$7.36	=	**$12,512**
	Roof Edge	Blocking & Metal Flashing	205	LF	x	$81.25	=	**$16,656**
	Waterproofing & Caulking	Misc. Waterproofing & Caulking	1	LSUM	x	$8,000.00	=	**$8,000**
07	***SUBTOTAL - WOODS & PLASTICS***							**$53,488**
	08. OPENINGS							
	Exterior Glazing Systems							
	Operable Glazing		596	SF	x	$192.00	=	**$114,432**
08	***SUBTOTAL - OPENINGS***							**$114,432**
	09. FINISHES							
	Wall Assembly Systems							
	Framing	Metal Studs & Clips	650	SF	x	$8.28	=	**$5,382**
	Sheathing	Exterior Gyp Board	650	SF	x	$6.74	=	**$4,381**
	Insulation	Batt & Rigid Insulation	650	SF	x	$3.25	=	**$2,113**
	Stucco Systems	3 Coat Stucco only Ply inc. VB	650	SF	x	$9.15	=	**$5,948**
	Paint	Paint on Stucco & Gyp	650	SF	x	$2.15	=	**$1,398**
	Gypsum Board	5/8 Moisture Resistant Gyp	650	SF	x	$3.10	=	**$2,015**

	Wall Finishes							
	Stucco	Direct Applied to CMU	2,006	SF	x	$8.50	=	**$17,051**
	Paint		4,012	SF	x	$2.10	=	**$8,425**
	Floor Finishes							
	Epoxy Flooring Systems	Continuation of Pool Deck	1,624	SF	x	$12.48	=	**$20,268**
	Ceiling Finishes							
	Acoustical Ceiling System		1,624	SF	x	$11.50	=	**$18,676**
	Paint		1,624	SF	x	$2.15	=	**$3,492**
09	***SUBTOTAL - FINISHES***							**$89,147**
	26. ELECTRICAL							
	Electrical Service & Distribution							
	Electrical Systems	Wiring, Recepticles, Etc.	1,624	SF	x	$12.50	=	**$20,300**
	Electrical Fixtures							
	Lighting Fixtures		8	EA	x	$1,850.00	=	**$14,800**
26	***SUBTOTAL - ELECTRICAL SYSTEMS***							**$35,100**
	31. EARTHWORK							
	Sitework General							
	Building Pad & Grade		1	LSUM	x	$11,260.00	=	**$11,260**
31	***SUBTOTAL - EARTHWORK***							**$11,260**
	32. EXTERIOR IMPROVEMENTS							
	Landscaping & Irrigation							
	Landscaping	Landscaping Allowance	1	LSUM	x	$8,000.00	=	**$8,000**
32	***SUBTOTAL - EXTERIOR IMPROVEMENTS***							**$8,000**
	01. GENERAL REQUIREMENTS							
	Project Management							
	Project Supervision							
	Project Manager(s) Time	(1) Project Manager(s)	4	MTH	x	$8,400.00	=	**$33,600**
	Software	Project Management Software & Cloud Services	4	MTH	x	$1,850.00	=	**$7,400**
	Field Supervision							
	Project Site Superintendent	(1) Site Superintendent(s)	4	MTH	x	$16,800.00	=	**$67,200**
	Field Office & Supplies							
	Temporary Toilets		4	MTH	x	$750.00	=	**$3,000**
	Field Office Supplies		4	MTH	x	$215.00	=	**$860**
	Maintenance & Housekeeping							
	Jobsite Clean-up	Temp Labor / Clean-up	4	MTH	x	$1,750.00	=	**$7,000**
	Temporary Controls & Safety							
	Safety Supplies		1	LSUM	x	$1,200.00	=	**$1,200**
	Site Signage		1	LSUM	x	$2,000.00	=	**$2,000**
	Construction Aids, Equipment, & Tools							
	Equipment Rentals		1	LSUM	x	$2,500.00	=	**$2,500**
	Punchlist Allowance		1	LSUM	x	$1,250.00		**$1,250**
	Trash and Dump Charges							
	Dumpster & Trash Removal Charges		3	EA	x	$850.00	=	**$2,550**
	SUBTOTAL - COST OF WORK							**$620,355**
	Cascading Costs							
	General Liability Insurance		Cost of Work		x	1.00%	=	**$6,204**
	Builder's Risk Insurance		Cost of Work		x	0.35%	=	**$2,171**
	Bonds		Cost of Work		x	1.00%	=	**$6,204**
01	***SUBTOTAL - GENERAL REQUIREMENTS***							**$143,138**
	00. PROCUREMENT & CONTRACTING							
	Fees & Overhead							
	Contractor's Fee		Cost of Work		x	6.00%	=	**$45,810**
	Construction Contingency		Cost of Work		x	3.00%	=	**$22,905**
00	***SUBTOTAL - CONTRACTOR'S FEE & CONTINGENCY***							**$68,714**
	PROJECT TOTAL							**$703,647**

Appendix #3 - Non Destructive Evaluation Testing

McKIM&CREED
ENGINEERS SURVEYORS PLANNERS

CITY OF CLEARWATER
LONG CENTER NATATORIUM

Technical Memorandum Draft
Long Center Structure Repairs Phase II

Date: December 07, 2023

Prepared for:
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1. INTRODUCTION

1.1 Background

The City of Clearwater's Long Center Natatorium (LCN) was originally constructed in 1988 as part of a four building complex providing education, training, and athletic facilities to the local community. The complex consists of an approximate 15.8 acre property located in central Pinellas County on the east side of North Belcher Road, almost midway between NE Coachman Road (Florida state road (SR 590)) and Sunset Point Road (county road 576). The street address is 1501 North Belcher Road in Clearwater, Florida.

The record drawings reviewed indicated the LCN as "Building A" for the complex. The four building complex is "L"-shaped with Building A and Building B comprising the north / south oriented leg and Building B, Building C and Building D comprising the east / west oriented leg. Building A is north of Building B. The site and building complex layout is shown below in **Figure 1.1**.

The LCN is primarily a structural steel framed building. Record drawings reviewed indicated the building frames are supported by cast-in-place (c.i.p.) reinforced concrete shallow foundations. The shallow foundations consist of spread footings at the columns and continuous strip footings supporting wall assemblies.

The structural steel framing at the LCN consists of roof truss assemblies spanning north / south direction over the approximate 120 foot distance over the Main and Therapeutic pools and their surrounding c.i.p. reinforced concrete pool deck areas. The trusses are comprised of square tube hollow shaped sections (HSS) of various thickness. Steel columns for the LCN consist of wide flange sections at the east and west side walls and vertical truss space frames below the roof trusses, along the north and south walls. These vertical space frame trusses consist of HSS members similar to the roof trusses. The steel framing in the pool area is exposed structural steel with a paint coating system finish. Horizontal beams and girts, in addition to diagonal bracing between the various trusses, consists of HSS square or rectangular members, similar in appearance to the trusses.

In November of 2021 McKim & Creed (M&C) contracted with the City of Clearwater to review and recommend specific repairs to interior portions of the existing approximately 33 year old LCN steel structure around the pool area. The city reported to M&C their personnel have observed multiple locations where the existing structural steel and anchor bolts appeared to be exhibiting loss of section due to corrosion. The interior of the pool area is enclosed by the existing roof and glass panels between the steel HSS sections at the north, east and west walls. The interior of this enclosed area of the LCN experiences humidity, thermal differences with the exterior environment and chemical off-gassing from the chlorine in

the pool. To determine the specific repairs M&C conducted a visual review of the facility to document the existing conditions, utilizing lift equipment to achieve an up-close observation of the steel assemblies, from pool deck elevation to the roof. Upon completion of documenting these existing conditions, M&C provided the city construction drawings detailing recommended repairs. Existing conditions where M&C recommended repairs, in general included the following:

1. Repair areas where the existing coating has peeled, flaked, bubbled, or other and no longer adheres to the surface of the steel.
2. Repair areas where coating exhibited conditions noted in Item No. 1 and surface rust observed.
3. Repair areas where coating exhibited conditions noted in Item No. 1 and rust observed, appeared to extend beyond the surface, into the steel sections and potentially reducing the thickness of the steel.
4. Repair areas where coating exhibited conditions noted in Item No. 1 and rust observed, extended through the surface, leaving a hole in the steel sections.

Recommended repairs in general included the following:

1. Remove existing areas of no and /or loose coating system top and base coats. Provide the required surface preparation and install the new repair coating system.
2. Remove existing surface rusted areas observed and provide the required surface preparation cleaning and install the new repair coating system.
3. Remove existing rusted areas observed, weld new plates and / or angles to the existing steel and provide the required surface preparation cleaning and install the new repair coating system.
4. Remove existing surface rust from areas around holes, weld new plates and / or angles to the existing steel and provide the required surface preparation cleaning and install the new repair coating system.

After completing the construction drawings M&C worked with the city to prioritize locations requiring immediate repairs and opting to repair remaining areas in a future project.

Figure 1.1 - Existing Long Center Site & Complex Layout

1.2 Project Goals and Objectives

The City of Clearwater has contracted with Wannemacher Jensen Architects (WJA), to provide architectural services to improve the LCN. It is M&C's understanding WJA's improvements include, but not limited to the following:

1. Removal of the existing glass panels and installation of a new curtain wall system outside of the existing steel frame.
2. Upgrading the air handling system in the pool area.
3. Implementing Phase II of repairing the LCN interior structural steel locations not addressed in the previous phase.

The previous phase by M&C included an onsite up-close visual review of the facility to document the existing conditions reported by the city's personnel. Documentation from construction administration activities of the initial construction could not be provided by the city. In addition to the site review, M&C's scope of services included review of existing record drawings from the original construction. However, services excluded from M&C's site review included the following:

1. Non-destructive testing of existing concrete, steel, or masonry assemblies.
2. Load testing of existing anchor bolt, connection bolt or welded connections to determine capacities.

3. Testing existing materials for chemical composition or material grades.
4. Load testing to determine existing construction assembly deflections.

To assist in implementing the LCN Phase II repairs, in September 2023, M&C subcontracted with WJA to conduct a Non-Destructive Evaluation (NDE), to gather additional data regarding the existing conditions initially reviewed in the previous phase, and potentially document new additional locations recommended for repairs.

This Technical Memorandum (TM) is provided to bridge the work conducted for the previous phase repairs project with the new NDE data and develop a summary of updated conclusions and recommendations. This TM will be utilized to help WJA, and M&C achieve the following future project goals:

1. Provide a complete set of Issued For Permit documents addressing the repair locations, the specific repair recommendations, and details for each location, in addition to the finish coating system.
2. Issue full size drawings to the City of Clearwater Building Department.
3. Issue full and half size drawings to the future CMAR to be hired by the City of Clearwater.

2. NON-DESTRUCTIVE EVALUATION DATA COLLECTION

M&C subcontracted with S&ME in September 2023 to material test the existing steel structure. S&ME mobilized to the LCN the second week of October. Testing the structural steel began October 9,2023 and concluded October 13, 2023.

2.1 Testing

S&ME utilized the "Long Center Natatorium Structural Frame Repairs" drawings prepared by M&C and dated May 2022, detailing the locations where repairs were recommended, for the City of Clearwater. From these drawings M&C documented approximately 122 steel joints. Focusing on locations where corrosion was visually evident lowered the number of locations testing would occur. Testing the steel involved non-destructive tests (NDT) to determine existing steel thickness at and around the points of corrosion. In general the majority of the locations of corrosion occur at steel connection joints (nodes) between the various, HSS tube to HSS tube, and HSS tube to wide flange column connections. In general testing included the following:

1. The NDT was an ultrasonic thickness test (UTT) procedure.
2. The NDT was performed by personnel certified to conduct Level II UTT.
3. The equipment utilized to conduct the NDT an Olympus, model no. 38DL Plus, ultrasonic thickness gage. facility.
4. The NDT testing procedure included conducting an initial test reading at the joint centerline, followed by additional tests at approximate 4 inch intervals out from the centerline, and concluding at approximately 16 inches maximum from the initial test.
5. Each joint test was documented with an Ultrasonic Examination Thickness Report detailing test information and results.
6. Each joint test location was given the same designation utilized by M&C in the May 2022 drawings.

2.2 Report

The *Report of UT Thickness Testing of Existing Structural Steel Members Clearwater Long Center Pool* by S&ME was November 6, 2023. In general the report includes project information regarding the site, testing services, methods of inspection for the tests, and comments regarding results of data. In addition individual Ultrasonic Examination Thickness Report for each joint tested and pictures from the time onsite

of the NDT's are included in the appendices. A summary of the minimum thickness measured at each joint is provided in. **Table 2.1** below. Regarding the table below note the following:

- Node Mk. No. = Building column grid.
- Elevation Mk. No. = Frame level height from bottom of column (5 framing intersects typical).

Table 2.1– Minimum Measured Thickness and Member Thickness Net Section Loss

Node Mk. No.	Elevation Mk. No.	Minimum Measured Thickness (inches)	Original Member Thickness (inches)	Member Thickness Net Loss (inches)
B-1-T2	2	0.103	0.25	0.147
B-1.3-T1	1	0.070	0.3125	0.243
B-2-T1	3	0.201	0.25	0.049
B-2.3-T1	2	0.163	0.3125	0.150
B-3-T1	3	0.113	0.25	0.137
B-4-T1	1	0.113	0.3125	0.200
B-4.3-T1	3	0.198	0.3125	0.115
B-5-T1	1	0.118	0.25	0.132
B-5.3-T1	1	0.097	0.3125	0.215
B-6-T1	1	0.239	0.3125	0.074
B-6.3-T1	1	0.234	0.25	0.016
B-7-T1	2	0.167	0.3125	0.146
B-8-T1	1	0.226	0.25	0.024
B-8.3-T1	2	0.211	0.25	0.039
B-9-T1	2	0.117	0.3125	0.196
B-9.3-T1	1	0.221	0.25	0.029
B-10-T1	2	0.208	0.25	0.042
B-10.3-T2	1	0.215	0.25	0.035
B.2-1-T2	1	0.405	0.50	0.095
B.4-1-T2-N	1	0.457	0.50	0.043
B.4-1-T2-S	1	0.376	0.50	0.124
B.4-10.3-T2-N	3	0.491	0.50	0.009
B.4-10.3-T2-S	2	0.478	0.50	0.022
B.5-1-T2-N	1	0.440	0.50	0.060
B.5-1-T2-S	1	0.440	0.50	0.060
B.5-10.3-T2	1	0.458	0.50	0.042
B.7-1-T2-N	1	0.440	0.50	0.060
B.7-1-T2-S	3	0.440	0.50	0.060
B.7-10.3-T2-N	3	0.467	0.50	0.033
B.7-10.3-T2-S	1	0.455	0.50	0.045
B.9-1-T2-N	3 & 4	0.440	0.50	0.060
B.9-1-T2-S	1	0.433	0.50	0.067

B.9-10.3-T2-N	1	0.328	0.50	0.172
B.9-10.3-T2-S	2	0.440	0.50	0.060
D-1-T2	2	0.112	0.25	0.130
D1.3-T1	4	0.185	0.25	0.065
D-10-T1	3	0.217	0.25	0.033
D-10.3-T2	2	0.207	0.25	0.043

Based upon the values shown in **Table 2.1** net section loss of the steel members varies from less than 1/16” to 1/4" maximum. For areas where corrosion was initially visually observed the design team has additional data to review the repair recommendations from the previous phase. Regarding the NDT report data provided note the following:

1. There were joints that were not tested due to safety access concerns with positioning the lift to access the steel and regarding the height of the joints, existing conduits, utilities and / or signage preventing hindering the vertical lift space.
2. Although the report provides a summary table indicating minimum member thickness measured for a joint assembly at each column, review of the individual Ultrasonic Examination Thickness Report documents for the various joints, indicates there are conditions where a single column has additional connections where the test results indicate section loss for multiple members.
3. The report includes information indicating locations where the extents of existing corrosion have increased in severity.

3. CONCLUSIONS

The information provided in the NDT and obtained for this NDE memorandum confirms section loss of the steel section wall thickness, for various connections observed to be exhibiting signs of corrosion, in the previous phase of the structural repairs. In addition the report data indicates profiles of the section loss from the center of the joints which can be used to assess the Phase II repair recommendations by the following:

1. Knowing the limits and the depth of the section loss allows the design team to be more efficient with the material lengths and widths of the repair plates and angles.
2. Knowing the depth of the section loss can help ensure the design team is providing an adequate design capable of withstanding the expected stresses the sections could be subjected to.

Utilizing the Ultrasonic Examination Thickness Report documents, M&C will use the member thickness data to verify the geometry of the connection repairs recommended in the previous phase. Review of the reports has indicated multiple locations where the plate assemblies may have to be revised, or added, to include diagonal bracing or horizontal beam and / or girt sections that were not accounted for due to the condition of the steel at the time of the previous visual observation.

The information provided in the NDT did not appear to indicate new areas of corrosion that have developed since the previous phase repairs. However, the NDT did indicate existing locations that have since continued to corrode. Note the following:

1. The most severe existing area of increased corrosion appears to be Node Mk. No. D-1T-2-3. At this location corrosion has progressed to a hole in the HSS tube wall (ref. photo nos. 8 & 9 pgs. 94 & 95 Appendix A).

The improvements WJA is planning and designing for the LCN will assist in the future maintenance of this facility for the City of Clearwater, resulting in a more efficient ventilation and air handling system, in addition to extending the structure's service life. This NDE is a critical component for the design team to extend the structure's service life, by providing an updated set of Issue For Permit documents. Provision of these documents will assist the design team in moving toward completion of project goals regarding implementing the second phase of structural repairs to the existing steel structure, and issuing repair documents to the city's Building department and the future construction managing consultant.

APPENDIX A – ULTRASONIC THICKNESS TESTING REPORT

Report of UT Thickness Testing of Existing Structural Steel Members
Clearwater Long Center Pool
Clearwater, Florida
S&ME Project No. 23050318

PREPARED FOR:

McKim & Creed, Inc.
1730 Varsity Drive, #500
Raleigh, North Carolina 27606

PREPARED BY:

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

November 6, 2023

November 6, 2023

McKim & Creed, Inc.
1730 Varsity Drive, #500
Raleigh, North Carolina 27606

Attention: Mr. Aubrey Haudricourt, P.E.

Reference: **Report of UT Thickness Testing of Existing Structural Steel Members**
Clearwater Long Center Pool Structural Assessment
Clearwater, Florida
S&ME Project No. 23050318

Dear Mr. Haudricourt:

S&ME, Inc. (S&ME) has completed the ultrasonic (UT) thickness testing services of the existing structural steel at the Clearwater Long Center Pool located at 1501 North Belcher Road, Clearwater, Florida. Our services were performed in general accordance with S&ME Proposal No. 23050318 dated April 5, 2023 as authorized by David Ardman, with McKim & Creed, Inc. on September 21, 2023. As noted in our proposal, our testing was limited to areas of the existing structure which were safe to access at the time of our site visit.

♦ PROJECT INFORMATION

Our understanding of the project is based on information provided to Mr. Perry Vezina of S&ME by Mr. Aubrey Haudricourt and David Ardman, with McKim & Creed, Inc. through a series of emails and phone conversations between April 4, 2023, and the date of this report. Appended to the emails was the following document:

- Structural Frame Repairs, Sheets S0.00 through S1.13 dated May 23,2022 as prepared by McKim & Creed, Inc.

We understand that McKim & Creed has performed a visual structural assessment of the existing structural steel at the Clearwater Long Center Pool located at 1501 North Belcher Road, Clearwater, Florida. This assessment identified several structural nodes or joints with visually evident corrosion. We also understand that in order to design repairs for the identified corrosion McKim & Creed requested nondestructive testing be performed to determine the material thickness at and around the corroded structural nodes or joints. McKim & Creed requested S&ME Inc. perform ultrasonic thickness testing of the structural steel members at the joints identified in the attached drawings S1.03-S1.13 (Appendix III). We understand that there are approximately 122 joints requiring testing.

♦ METHODS OF INSPECTION

Ultrasonic thickness testing was performed on safely accessible members using an Olympus, model 38DL Plus, ultrasonic thickness gage. Ultrasonic thickness testing was performed by Mr. Larry Jernigan, a certified ultrasonic thickness testing (UTT) level II. UT thickness measurements are annotated on the UTT reports in Appendix I of this

report. Ultrasonic thickness testing was performed and interpreted in general conformance to ASTM E 797, and S&ME work instruction WI-TP-NDT-UT-02.

Each location was tested from the inside of the structure from a scissor lift provided by McKim & Creed. Measurements were taken starting at the center line of the column and the node and radiating outward along the members at approximately 4-inch intervals at each node identified. Testing was limited to areas which were safe to access at the time of our site visit. A scissor lift was used for access to elevated locations during field examination activities. The lift was not able to safely access the entire structure due to conflict with the HVAC ducting support structure.

♦ FINDINGS

Ultrasonic thickness measurements were taken at safely accessible steel members identified on Structural Frame Repair sheets supplied by McKim & Creed prior to our testing. Complete thickness information is annotated in Appendix I of this report. The summary table below identifies the minimum thickness measurement recorded of all the members tested at each node. Many of the nodes appear to have been constructed using HSS members of different nominal wall thicknesses. The measurements in red below, and on the thickness data sheets in Appendix I, indicate a measurement ≥ 0.050″ below what appears to have been the original nominal thickness of the member based on the other thickness measurements of that particular member. This is for reporting purposes only and assumes the following commercially available HSS member nominal wall thicknesses:

- 0.250″
- 0.313″
- 0.375″
- 0.500″

Minimum Measured Thickness at Each Node					
Node Mark	***Elevation 1***	***Elevation 2***	***Elevation 3***	***Elevation 4***	***Elevation 5***
D-1.3-T1	0.202″	NST	NST	0.185″	NST
D-1-T2	0.229″	0.112″	0.205″	0.125″	NST
B-1-T2	0.137″	0.103″	0.105″	NST	NSA
B-1.3-T1	0.070″	0.123″	0.200″	NSA	NST
B-2-T1	0.218″	0.209″	0.201″	NST	NST
B-2.3-T1	0.254″	0.163″	0.203″	NST	NST
B-3-T1	NST	0.225″	0.113″	NSA	NSA
B-3.3-T1	NST	NST	NST	NSA	NSA
B-4-T1	0.113″	NST	0.213″	NSA	NST
B-4.3-T1	NST	0.222″	0.198″	NSA	NSA
B-5-T1	0.118″	0.123″	0.250″	NSA	NSA
B-5.3-T1	0.097″	0.222″	0.180″	NSA	NSA
B-6-T1	0.114″	0.214″	0.211″	NSA	NSA
B-6.3-T1	0.149″	0.203″	0.222″	NSA	NSA
B-7-T1	0.186″	0.167″	0.201″	NSA	NSA

B-7.3-T1	NST	NST	NST	NSA	NSA
B-8-T1	0.226″	NST	NST	NST	NSA
B-8.3-T1	0.223″	0.211″	0.223″	NSA	NSA
B-9-T1	0.226″	0.117″	0.121″	NSA	NSA
B-9.3-T1	0.221″	0.222″	0.229″	NSA	NSA
B-10-T1	0.229″	0.208″	0.216″	NSA	NST
B-10.3-T2	0.215″	0.229″	0.227″	NSA	NSA
D-10.3-T2	0.228″	0.207″	0.231″	0.232″	NST
D-10-T1	0.228″	0.218″	0.217″	0.232″	NST
B.9-1-T2-S	0.433″	0.451″	0.445″	NST	NST
B.9-1-T2-N	0.450″	0.440″	0.440″	NST	NST
B.7-1-T2-S	NST	NST	0.440″	NST	NST
B.7-1-T2-N	0.440″	0.452″	NST	NST	NST
B.5-1-T2-S	0.440″	NST	NST	NST	NST
B.5-1-T2-N	0.440″	NST	NST	NST	NST
B.4-1-T2-S	0.376″	NST	NST	NST	NST
B.4-1-T2-N	0.457″	NST	NST	NST	NST
B.2-1-T2-N	0.405″	NST	0.440″	NST	NST
B.2-10.3-T2-S	NST	NST	NST	NSA	NST
B.4-10.3-T2-N	NST	NST	0.491″	NST	NSA
B.4-10.3-T2-S	0.485″	0.478″	NST	NSA	NST
B.5-10.3-T2-S	0.458″	NST	NST	NSA	NST
B.7-10.3-T2-N	NST	NST	0.467″	NST	NST
B.7-10.3-T2-S	0.455″	NST	NST	NSA	NST
B.9-10.3-T2-N	0.328″	0.435″	NST	NST	NST
B.9-10.3-T2-S	0.443″	0.441″	NST	0.229″	NST

- NST = Node not scheduled for testing.
- NSA = Node could not be safely accessed for testing.

SUMMARY

Significant material thickness loss due to corrosion appeared to be localized near the junction of the nodes tested. Material thickness readings appeared more consistent with less loss as distance increased from the center of the nodes. Location D-1-T2-3 had complete through wall loss due to corrosion (see images 8 & 9 in Appendix II). Measurements annotated at this node represent readings taken adjacent to the visible through wall loss.

♦ CLOSING

S&ME appreciates the opportunity to be of service to you. If you have any questions regarding the information provided herein, please do not hesitate to contact us.

Sincerely,

S&ME, Inc.

Russell Ogden, ASNT NDT Level III
NDE Operations Manager

Perry R. Vezina, ASNT NDT Level III
NDE/NDT Service Line Leader

Appendices

Appendix I – **UT Thickness Data Sheets**

Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

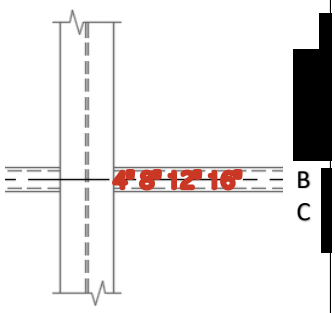
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.2-1-T2-1N*** ***Center:*** ***N/A***

	6"	8"	12"	16"	20"	24"	28"	32"
A		**0.467"**	**0.471"**	**0.465"**				
B	**0.405"**	**0.463"**	**0.464"**	**0.461"**				
C		**0.463"**	**0.467"**	**0.467"**				
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

West side view *"1N"*



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

Disclaimer: The presence of S&ME at the project site shall not be construed as an acceptance or approval of activities at the site. S&ME is at the project site to perform specific services and has certain responsibilities which are limited to those specifically authorized in our agreement with our client. In no event shall S&ME be responsible for the safety or means and methods of other parties at the project site. The information presented in this field report has not been reviewed by an engineer and is to be considered preliminary.

Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

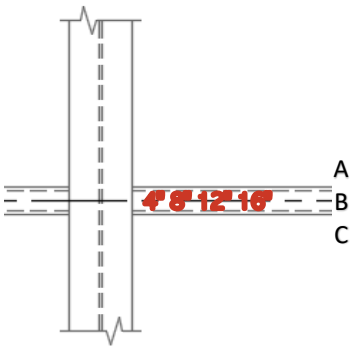
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B.2-1-T2-3N*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.440"**	**0.455"**	**0.456"**	**0.457"**				
C								
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

West side view *"3N"*



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Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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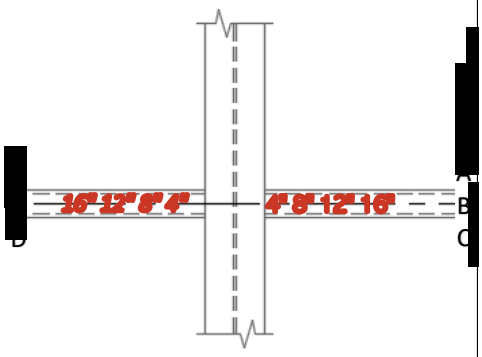
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.4-1-T2-1N&1S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.460"**	**0.460"**	**0.457"**	**0.462"**				
C								
D								
E	**0.376"**	**0.463"**	**0.460"**	**0.461"**				
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

"1S" *West side view* *"1N"*



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Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B.4-10.3-T2-1S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.485"**	**0.497"**	**0.495"**	**0.492"**				
C		**0.511"**	**0.511"**	**0.508"**				
D								
E								
F								
G								
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J								
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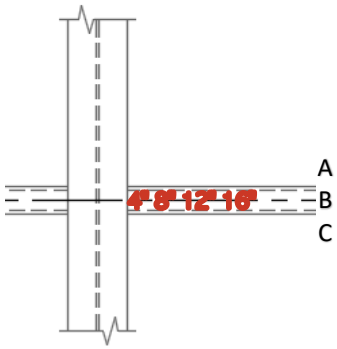
L								
M								
N								
O								
Aa								
Bb								
Cc								

East view *"1S"*



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

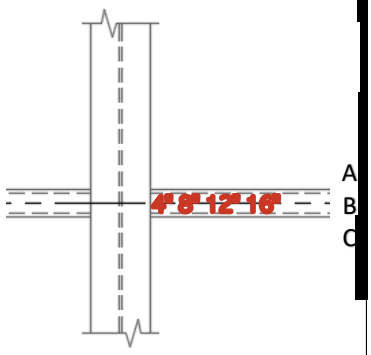
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B.4-10.3-T2-2S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.480"**	**0.482"**	**0.481"**	**0.478"**				
C								
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								

East view *"2S"*



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B.4-10.3-T2-3N*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A	**0.508"**	**0.502"**	**0.504"**	**0.505"**				
B	**0.495"**	**0.491"**	**0.501"**	**0.496"**				
C								
D								
E								
F								
G								
H								
I								
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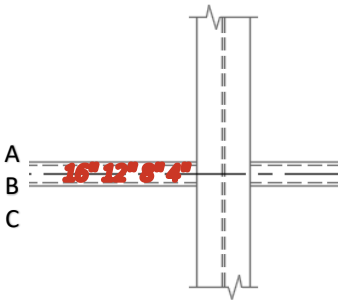
L								
M								
N								
O								
Aa								
Bb								
Cc								

"3N East view



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Larry Jernigan	UT Level II	Larry Jernigan	10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

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ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

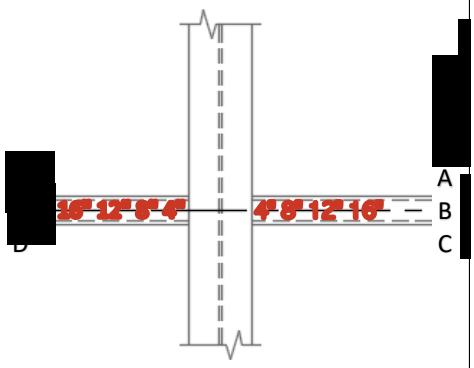
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.5-1-T2-1N&1S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.440"**	**0.454"**	**0.453"**	**0.454"**				
C		**0.460"**	**0.460"**	**0.459**				
D	**0.444"**	**0.454"**	**0.452"**	**0.449"**				
E		**0.442"**	**0.440"**	**0.440"**				
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

"1S" *West side view* *"1N"*



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

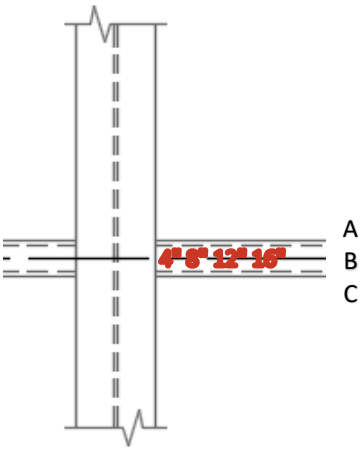
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B.5-10.3-T2-1S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.489"**	**0.493"**	**0.487"**	**0.485"**				
C	**0.458"**	**0.460"**	**0.460"**	**0.460"**				
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								

East view *"1S"*



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

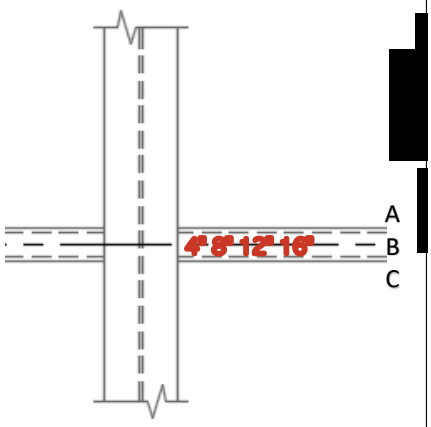
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.7-1-T2-1N*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.440"**	**0.449"**	**0.454"**	**0.449"**				
C		**0.473"**	**0.462"**	**0.476"**				
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

West side view *"1N"*



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Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

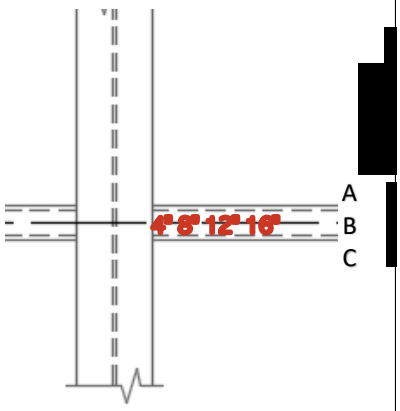
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.7-1-T2-2N*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.452"**	**0.467"**	**0.468"**	**0.468"**				
C								
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

West side view *"2N"*



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Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

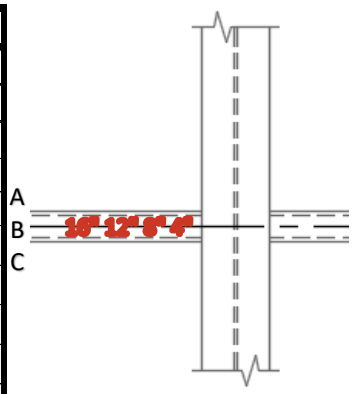
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.7-1-T2-3S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.440"**	**0.454"**	**0.456"**	**0.455"**				
C								
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

"3S" *West side view*



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Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

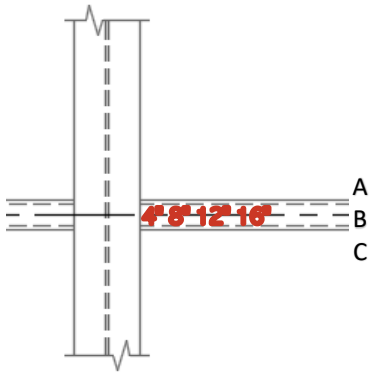
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B.7-10.3-T2-1S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.456"**	**0.459"**	**0.455"**	**0.457"**				
C	**0.460"**	**0.460"**	**0.460"**	**0.460"**				
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								

East view *"1S"*



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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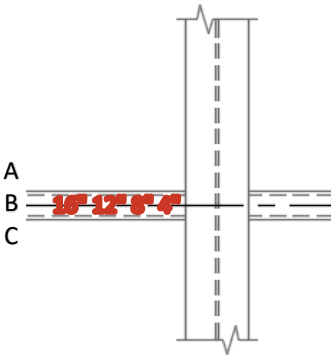
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B.7-10.3-T2-3N*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.467"**	**0.472"**	**0.470"**	**0.468"**				
C								
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								

"3N" *East view*



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.9-1-T2-1N&S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.450"**	**0.455"**	**0.452"**	**0.452"**				
C		**0.494"**	**0.476"**	**0.486"**				
D	**0.440"**	**0.458"**	**0.455"**	**0.455"**				
E		**0.433"**	**0.438"**	**0.434"**				
F								
G								
H								
I								
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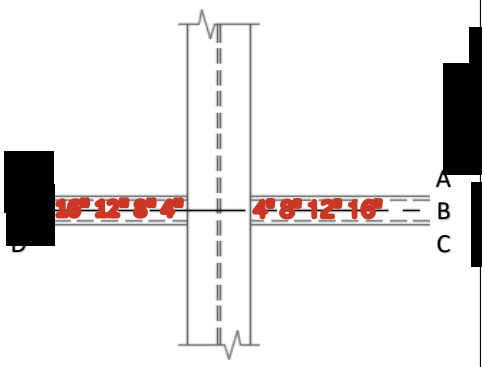
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

"1S" *West side view* *"1N"*



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Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ASME

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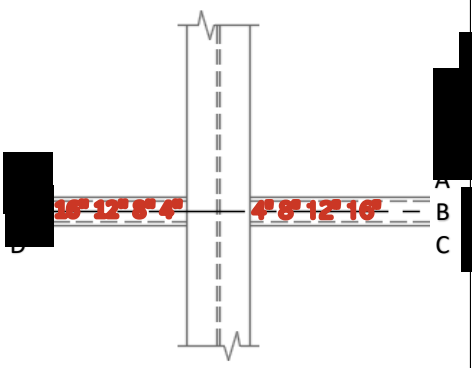
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.9-1-T2-2N&S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.440"**	**0.442"**	**0.445"**	**0.441"**				
C								
D								
E	**0.451"**	**0.463"**	**0.463"**	**0.469"**				
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

"2S" *West side view* *"2N"*



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Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

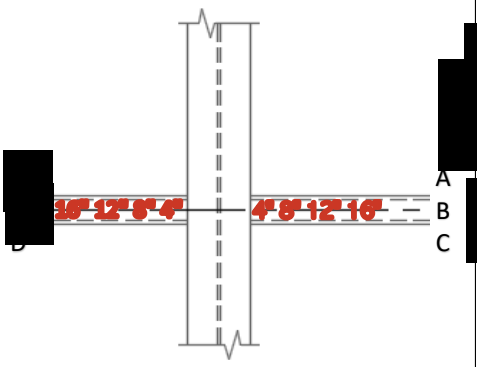
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B.9-1-T2-3N&S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.440"**	**0.453"**	**0.452"**	**0.453"**				
C								
D								
E	**0.445"**	**0.453"**	**0.453"**	**0.452"**				
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

"3S" *West side view* *"3N"*



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Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

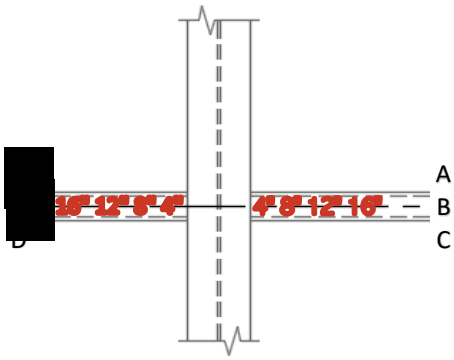
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B.9-10.3-T2-1N&1S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.463"**	**0.462"**	**0.464"**	**0.465"**				
C	**0.443"**	**0.452"**	**0.453"**	**0.452"**				
D	**0.464"**	**0.469"**	**0.463"**	**0.460"**				
E	**0.328"**	**0.454"**	**0.459"**	**0.455"**				
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								

"1N" *East view* *"1S"*



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

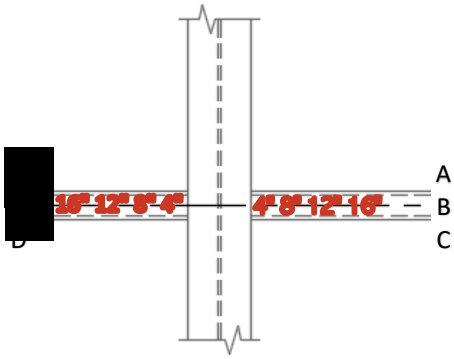
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B.9-10.3-T2-2N&2S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.447"**	**0.456"**	**0.449"**	**0.441"**				
C		**0.469"**	**0.470"**	**0.468"**				
D								
E	**0.439"**	**0.440"**	**0.442"**	**0.442"**				
F	**0.464"**	**0.435"**	**0.455"**	**0.464"**				
G								
H								
I								
J								
K								
L								
M								
N								
O								
Aa								
Bb								
Cc								

"2N" *East view* *"2S"*



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Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

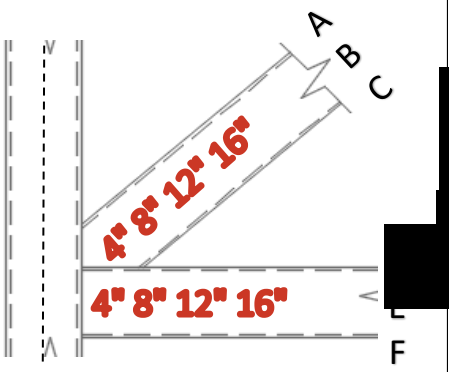
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

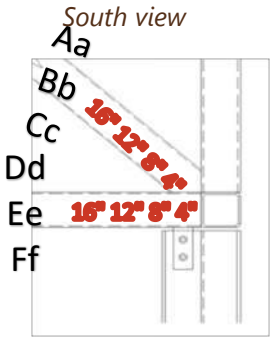
Location: ***B.9-10.3-T2-4S*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A	**0.232"**	**0.233"**	**0.230"**	**0.229"**				
B	**0.229"**	**0.230"**	**0.230"**	**0.231"**				
C								
D								
E	**0.317"**	**0.316"**	**0.316"**	**0.316"**				
F								
G								
H								
I								
J								
K								
L								
Aa		**0.234"**		**0.229"**				
Bb	**0.234"**	**0.233"**	**0.232"**	**0.233"**				
Cc		**0.233"**	**0.234"**	**0.234"**				
Dd	**0.235"**	**0.235"**	**0.234"**	**0.236"**				
Ee	**0.235"**	**0.236"**	**0.235"**	**0.236"**				
Ff		**0.237"**		**0.235"**				

East view *"4S"*



South view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

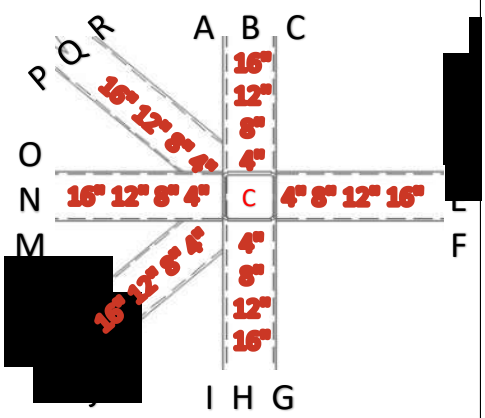
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-1.3-T1-1*** ***Center:*** ***0.373"***

	4"	8"	12"	16"	20"	24"	28"	32"
A			0.366"	0.361"				
B	0.353"	0.352"	0.358"	0.360"				
C	0.357"	0.357"	0.358"	0.361"				
D								
E	0.070"	0.353"	0.345"	0.344"				
F	0.076"							
G			0.362"	0.357"				
H	0.352"	0.351"	0.351"					
I				0.356"				
J								
K	0.233"	0.234"	0.234"	0.234"				
L		0.239"	0.234"	0.234"				
M								
N	0.228"	0.231"	0.231"	0.231"				
O			0.241"	0.241"				
P								
Q	0.212"	0.239"	0.237"	0.235"				
R		0.237"	0.237"	0.237"				

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

**Material was observed to be thin along the E and F face corners at connection joint*

Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

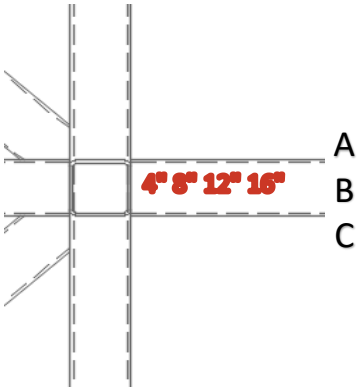
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-1.3-T1-2*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.123"**	**0.343"**	**0.344"**	**0.344"**	**0.346"**			
C								
D								
E								
F								
G								
H								
I								
J								
K								
L								
M								
N								
O								
P								
Q								
R								

South side view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

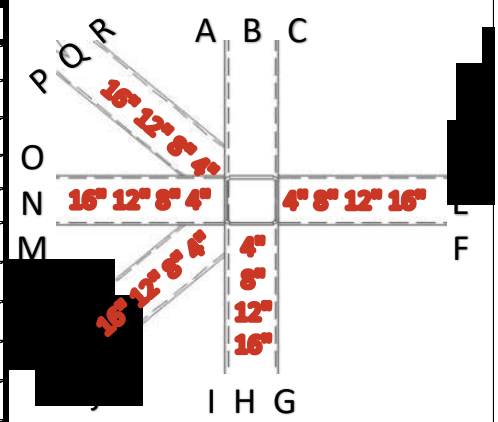
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-1.3-T1-3*** ***Center:*** ***0.353"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B								
C								
D								
E	**0.200"**	**0.341"**	**0.344"**	**0.338"**				
F								
G								
H	**0.352"**	**0.351"**	**0.352"**	**0.352"**				
I			**0.363"**	**0.363**				
J								
K	**0.225"**	**0.233"**	**0.239"**	**0.231"**				
L			**0.234"**	**0.238"**				
M								
N	**0.237"**	**0.236"**	**0.236"**					
O								
P		**0.235"**	**0.236"**					
Q	**0.232**	**0.232"**	**0.225"**	**0.222"**				
R								

North view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

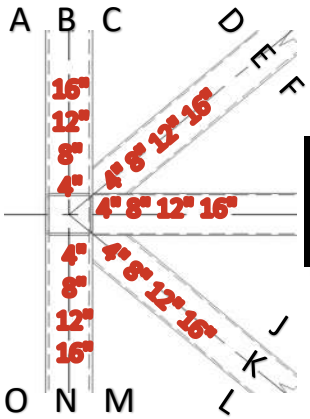
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

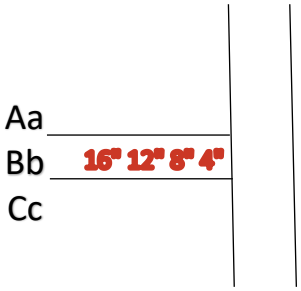
Location: ***B-1-T2-1*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B								
C		**0.359"**	**0.365"**	**0.359"**				
D		**0.238"**	**0.244"**	**0.239"**				
E	**0.202"**	**0.248"**	**0.242"**	**0.238"**				
F								
G		**0.237"**	**0.240"**	**0.239"**				
H	**0.137"**	**0.236"**	**0.239"**	**0.232"**				
I								
J		**0.239"**	**0.250"**	**0.238"**				
K	**0.202"**	**0.212"**	**0.205"**	**0.228"**				
L								
M	**0.360"**	**0.365"**	**0.367"**	**0.362"**				
N								
O								
Aa								
Bb	**0.273"**	**0.463"**	**0.468"**	**0.460"**				
Cc								
Dd								

North view



West side view



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Larry Jernigan	UT Level II	Larry Jernigan	10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

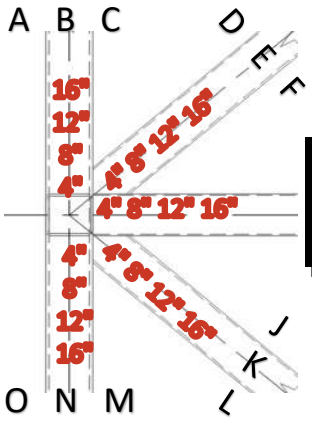
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

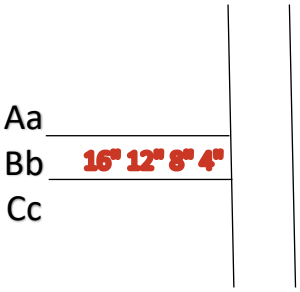
Location: ***B-1-T2-2*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	0.360"	0.369"	0.362"	0.365"				
C								
D								
E	0.103"	0.235"	0.237"	0.235"				
F								
G								
H	0.115"	0.238"	0.239"	0.241"				
I								
J								
K	0.211"	0.347	0.348"	0.336"				
L		0.355"	0.358"	0.343"				
M								
N	0.362"	0.368"	0.362"	0.362"				
O								
Aa								
Bb	0.366"	0.457"	0.457"	0.461"	0.454"	0.467"		
Cc								
Dd								

North view



West side view



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Larry Jernigan	UT Level II	Larry Jernigan	10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

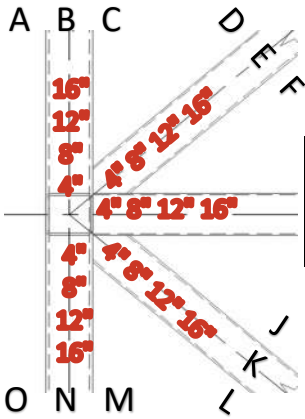
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

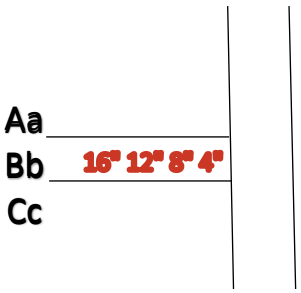
Location: ***B-1-T2-3*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B		0.125"						
C			0.365"	0.370"	0.362"			
D		0.248"	0.252"	0.239"				
E	0.156"	0.254"	0.252"	0.232"	0.231"			
F		0.263"	0.244"	0.231"	0.237"			
G		0.228"	0.229"	0.229"				
H	0.122"	0.229"	0.186"	0.186"	0.235"			
I								
J		0.231"	0.232"	0.233"				
K	0.105"	0.223"	0.233"	0.225"	0.224"			
L								
M								
N		0.366"	0.357"	0.365"				
O								
Aa								
Bb	0.329"	0.455"	0.469"	0.455"				
Cc								
Dd								

North view



West side view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

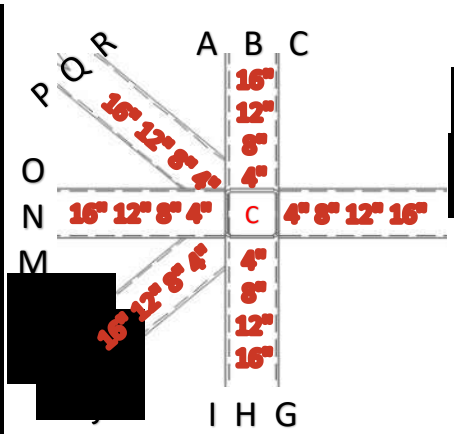
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-2.3-T1-1*** ***Center:*** ***0.331"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B		**0.387"**	**0.376"**	**0.374"**				
C		**0.385"**	**0.382"**	**0.390"**				
D								
E	**0.389"**	**0.382"**	**0.376"**	**0.369"**				
F								
G								
H		**0.391"**	**0.395"**	**0.392"**				
I		**0.381"**	**0.379"**	**0.379"**				
J		**0.256"**	**0.254"**	**0.258"**				
K	**0.268"**	**0.259"**	**0.256"**	**0.260"**				
L								
M								
N	**0.271"**	**0.261"**	**0.259"**	**0.259"**				
O			**0.255"**	**0.255"**				
P		**0.266"**						
Q	**0.278"**	**0.267"**	**0.269"**	**0.262"**				
R		**0.269"**		**0.268"**				

South side view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

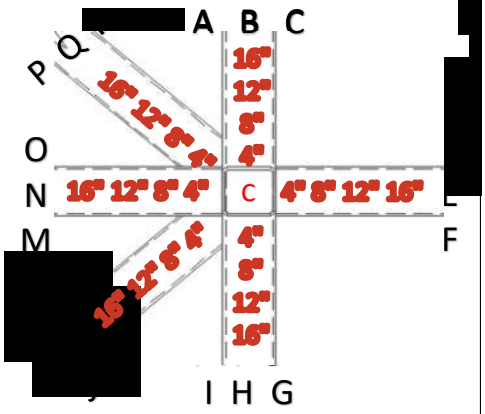
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-2.3-T1-2*** ***Center:*** ***0.399"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.393"**	**0.379"**	**0.375"**	**0.372"**				
C			**0.377"**	**0.378"**				
D								
E	**0.163"**	**0.380"**	**0.380"**	**0.379"**				
F								
G								
H	**0.370"**	**0.389"**	**0.374"**	**0.375"**				
I			**0.378"**	**0.383"**				
J		**0.258"**	**0.258"**	**0.263"**				
K	**0.253"**	**0.261"**	**0.264"**	**0.268"**				
L		**0.270"**	**0.267"**	**0.270"**				
M			**0.280"**	**0.274"**				
N	**0.266"**	**0.265"**	**0.269"**	**0.257"**				
O								
P								
Q	**0.274"**	**0.261"**	**0.267"**	**0.273"**				
R	**0.273"**	**0.264"**	**0.258"**					

South side view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

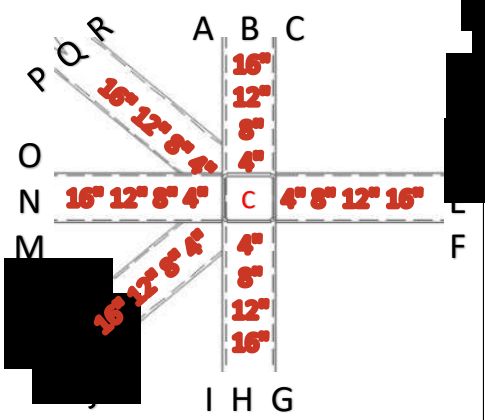
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-2.3-T1-3*** ***Center:*** ***0.350"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.348"**	**0.348"**	**0.348"**	**0.349"**				
C	**0.361"**	**0.362"**	**0.347"**	**0.347"**				
D		**0.350"**	**0.350"**	**0.350"**				
E		**0.331**	**0.330"**	**0.331"**				
F								
G	**0.349"**	**0.346"**	**0.366"**	**0.365"**				
H	**0.348"**	**0.349"**	**0.348"**	**0.350"**				
I								
J								
K	**0.213"**	**0.211"**	**0.211"**	**0.220"**	**0.236"**			
L			**0.236"**	**0.223"**				
M			**0.235"**	**0.235"**				
N	**0.232"**	**0.232"**	**0.233"**	**0.223"**				
O		**0.231"**	**0.237"**	**0.235"**				
P								
Q	**0.203"**	**0.249"**	**0.249"**	**0.249"**				
R		**0.243"**	**0.242"**	**0.240"**				

South side view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

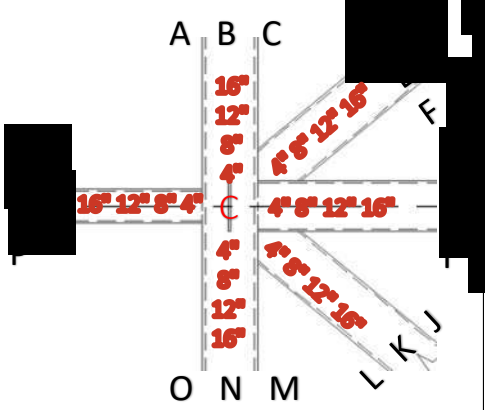
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-2-T1-1*** ***Center:*** ***0.353"***

	4"	8"	12"	16"	20"	24"	28"	32"
A	**0.356"**	**0.356"**	**0.359"**	**0.359"**				
B	**0.367"**	**0.368"**	**0.367"**	**0.367"**				
C								
D	**0.219"**	**0.231"**	**0.233"**	**0.233"**				
E		**0.230"**	**0.230"**	**0.233"**				
F								
G								
H	**0.218"**	**0.231"**	**0.247"**	**0.247"**				
I								
J		**0.237"**	**0.235"**	**0.235"**				
K	**0.237"**	**0.237"**	**0.247"**	**0.247"**				
L								
M		**0.349"**	**0.349"**	**0.349"**				
N	**0.349"**	**0.349"**	**0.364"**	**0.364"**				
O								
P								
Q	**0.343"**	**0.344"**	**0.343"**	**0.357"**				
R		**0.357"**	**0.359"**					

North side view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

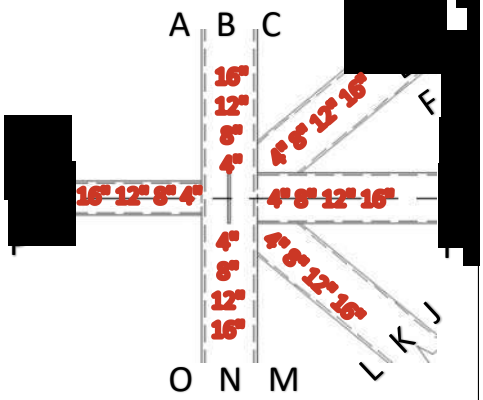
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-2-T1-2*** ***Center:*** ***0.349"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.347"**		**0.325"**	**0.349"**				
C		**0.348"**	**0.347"**	**0.341"**				
D		**0.240"**	**0.243"**	**0.209"**	**0.246"**			
E	**0.225"**	**0.233"**	**0.249"**	**0.234"**				
F								
G								
H	**0.227"**	**0.233"**	**0.231"**	**0.233"**				
I								
J		**0.236"**	**0.238"**	**0.240"**				
K	**0.227"**	**0.234"**	**0.236"**	**0.237"**				
L								
M								
N	**0.348"**	**0.348"**	**0.348"**	**0.349"**				
O	**0.355"**	**0.355"**		**0.346"**				
P								
Q	**0.342"**	**0.342"**	**0.342"**	**0.342"**				
R	**0.346"**	**0.347"**	**0.348"**	**0.346"**				

North view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

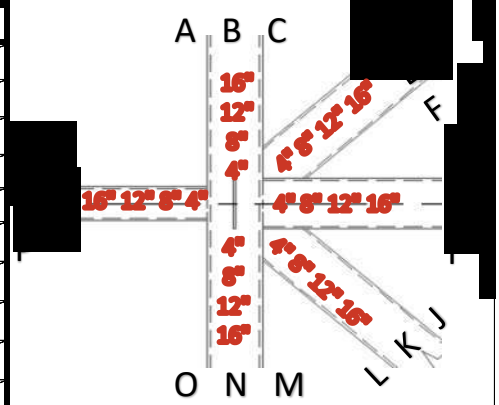
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-2-T1-3*** ***Center:*** ***0.331"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.347"**	**0.349"**	**0.350"**	**0.350"**				
C								
D								
E	**0.206"**	**0.235"**	**0.235"**	**0.235"**				
F								
G		**0.235"**	**0.238"**	**0.238"**				
H	**0.214"**	**0.207"**	**0.232"**	**0.230"**				
I				**0.236"**				
J		**0.235"**	**0.235"**	**0.236"**				
K	**0.201"**	**0.232"**	**0.248"**	**0.232"**				
L	**0.203"**	**0.236"**	**0.236"**					
M		**0.348"**	**0.353"**	**0.355"**				
N	**0.324"**	**0.327"**	**0.365"**	**0.364"**				
O								
P								
Q	**0.350"**	**0.336"**	**0.340"**	**0.340"**				
R								

South side view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

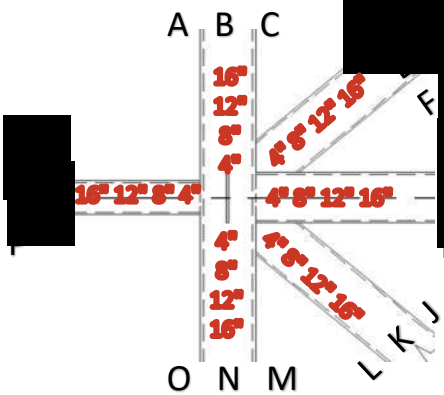
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-3-T1-2*** ***Center:*** ***352"***

	4"	8"	12"	16"	20"	24"	28"	32"
A	**0.356"**	**0.337"**	**0.370"**	**0.354"**				
B	**0.353"**	**0.367"**	**0.352"**	**0.352"**				
C								
D		**0.238"**	**0.238"**	**0.235"**				
E	**0.225"**	**0.233"**	**0.233"**	**0.233"**				
F								
G		**0.231"**	**0.232"**	**0.233"**				
H	**0.237"**	**0.232"**	**0.232"**	**0.230"**				
I								
J		**0.231"**	**0.232"**	**0.232"**				
K	**0.237"**	**0.233"**	**0.233"**	**0.233"**				
L								
M		**0.355"**	**0.355"**	**0.354"**				
N	**0.352"**	**0.366"**	**0.350"**	**0.351"**				
O		**0.353"**	**0.356"**	**0.348"**				
P								
Q	**0.342"**	**0.351"**	**0.342"**	**0.343"**				
R		**0.349"**	**0.351"**	**0.351"**				

North view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

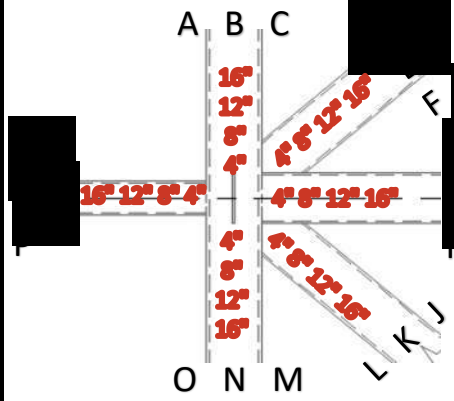
Project #:	23050318	Report Date:	10-10-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-3-T1-3*** ***Center:*** ***0.352"***

	4"	8"	12"	16"	20"	24"	28"	32"
A	0.355"	0.355"	0.358"					
B	0.353"	0.368"	0.368"	0.352"				
C		0.368"						
D								
E	0.113"		0.116"	0.117"	0.234"	0.234"	0.234"	0.234"
F								
G		0.236"	0.236"	0.236"				
H	0.232"	0.233"	0.232"	0.232"				
I								
J		0.215"	0.195"	0.199"	0.207"	0.238"	0.238"	
K	0.230"	0.210"	0.225"	0.230"	0.231"			
L								
M		0.351"	0.356"	0.355"				
N	0.352"	0.352"	0.352"	0.352"				
O	0.347"	0.355"	0.335"	0.358"				
P								
Q	0.331"	0.311"	0.340"	0.347"				
R		0.347"	0.348"	0.350"				

North view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

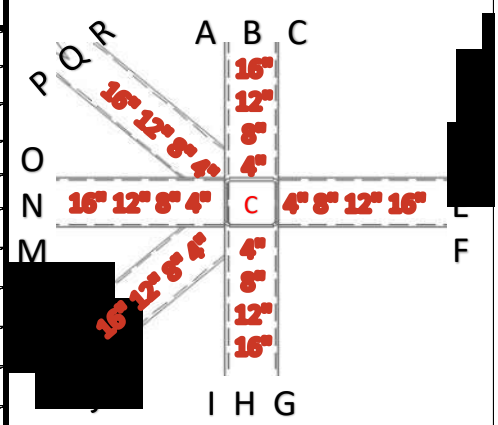
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-4.3-T1-2*** ***Center:*** ***0.353"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.309"	0.348"	0.334"				
B	0.352"	0.352"	0.350"	0.351"				
C	0.355"	0.354"	0.355"	0.346"				
D								
E	0.322"	0.325"	0.355"	0.337"				
F	0.348"	0.348"	0.348"	0.348"				
G	0.339"	0.365"	0.350"	0.366"				
H	0.351"	0.351"	0.351"	0.351"				
I		0.360"	0.360"	0.357"				
J								
K	0.222"	0.248"	0.249"	0.249"				
L			0.235"	0.234"				
M								
N	0.229"	0.245"	0.244"	0.230"				
O		0.233"	0.233"	0.234"				
P								
Q	0.228"	0.231"	0.232"	0.232"				
R		0.235"	0.233"	0.233"				

North view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

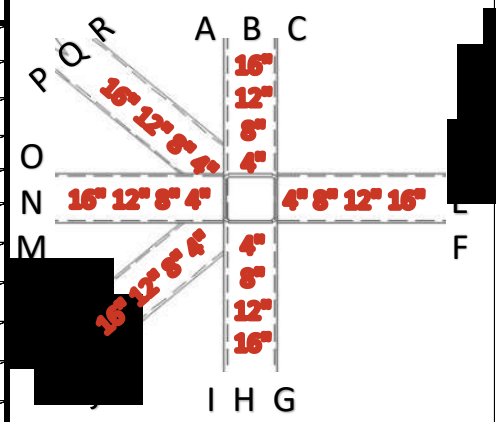
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-4.3-T1-3*** ***Center:*** ***0.354"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.360"	0.357"	0.358"				
B	0.351"	0.357"	0.351"	0.350"				
C		0.351"	0.351"	0.352"				
D	0.345"	0.336"	0.322"	0.349"				
E	0.338"	0.322"	0.342"	0.357"				
F								
G		0.350"		0.352"	0.353"			
H	0.351"	0.350"	0.327"	0.351"				
I		0.357"	0.359"	0.359"				
J			0.236"	0.236"				
K	0.198"	0.233"	0.233"	0.232"				
L		0.238"	0.238"	0.236"				
M			0.231"	0.231"				
N	0.230"	0.230"	0.230"	0.230"				
O		0.235"	0.231"	0.234"				
P								
Q	0.228"	0.235"	0.235"	0.235"				
R	0.238"	0.238"	0.232"					

South side view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

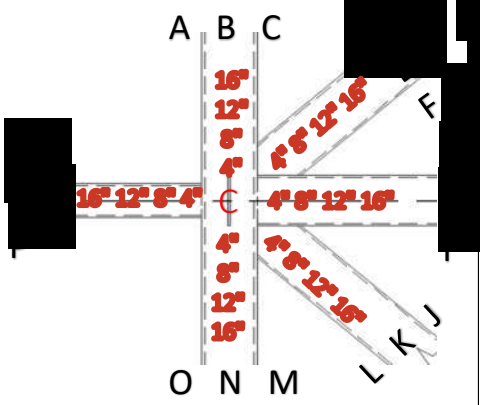
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-4-T1-1*** ***Center:*** ***0.352"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.351"**	**0.352**	**0.352"**	**0.351"**				
C		**0.351"**	**0.351"**	**0.351"**				
D		**0.243"**	**0.242"**	**0.244"**				
E	**0.228"**	**0.235"**	**0.249"**	**0.249"**				
F		**0.235"**	**0.235"**	**0.236"**				
G		**0.234"**	**0.235"**	**0.234"**				
H	**0.231"**	**0.232"**	**0.232"**	**0.232"**				
I								
J			**0.240"**	**0.238"**				
K	**0.230"**	**0.245"**	**0.245"**	**0.245"**				
L		**0.236"**	**0.234"**	**0.237"**				
M		**0.355"**	**0.355"**	**0.355"**				
N	**0.352"**	**0.352"**	**0.352"**	**0.352"**				
O								
P								
Q	**0.113"**	**0.322"**	**0.334"**	**0.345"**				
R								

North view



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Larry Jernigan	UT Level II		10-10-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

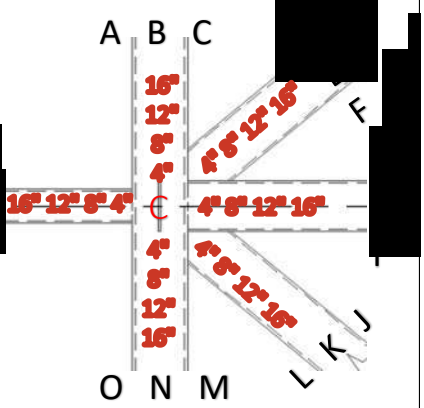
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-4-T1-3*** ***Center:*** ***0.353"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.352"**	**0.352"**	**0.352"**	**0.351"**				
C		**0.351"**	**0.356"**	**0.356"**				
D		**0.241"**	**0.240"**	**0.241"**				
E	**0.240"**	**0.233"**	**0.235"**	**0.235"**				
F		**0.241"**	**0.241"**	**0.241"**				
G		**0.237"**	**0.235"**	**0.234"**				
H	**0.232"**	**0.231"**	**0.231"**	**0.231"**				
I			**0.232"**	**0.233"**				
J			**0.231"**	**0.231"**				
K	**0.213"**	**0.213"**	**0.233"**	**0.232"**				
L	**0.229"**	**0.235"**	**0.236"**	**0.236"**				
M			**0.329"**	**0.338**				
N	**0.330"**	**0.330"**	**0.332"**	**0.333"**				
O								
P								
Q	**0.341"**	**0.341"**	**0.342"**	**0.343"**				
R								

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

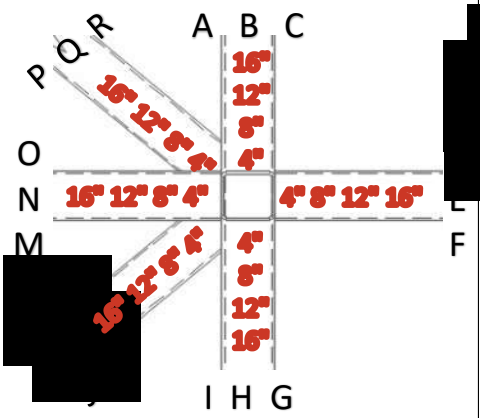
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-5.3-T1-1*** ***Center:*** ***0.135"***

	4"	8"	12"	16"	20"	24"	28"	32"
A			**0.383"**	**0.398"**				
B	**0.395"**	**0.390"**	**0.386"**	**0.386"**				
C				**0.398"**				
D								
E	**0.097"**	**0.377"**	**0.376"**	**0.377"**				
F								
G								
H	**0.374"**	**0.389"**	**0.378"**	**0.376"**				
I								
J	**0.275"**	**0.264"**	**0.267"**	**0.263"**				
K	**0.267"**	**0.259"**	**0.254"**	**0.260"**				
L		**0.277"**	**0.268"**	**0.258"**				
M								
N	**0.267"**	**0.268"**	**0.268"**	**0.263"**				
O		**0.268"**	**0.264"**	**0.263"**				
P								
Q	**0.275"**	**0.279"**	**0.272"**	**0.264"**				
R		**0.286"**	**0.278"**	**0.276"**				

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

**Center and E Face was observed to have a thin wall along the its joint, additional readings along the other sides could not be taken due to window framing covering the surfaces.*

Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

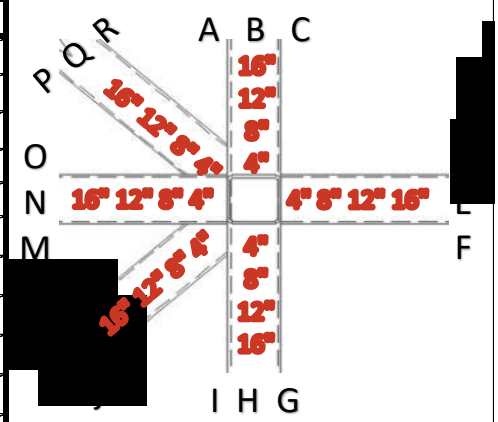
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-5.3-T1-2*** ***Center:*** ***0.348"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.351"**	**0.351"**		**0.348"**				
C		**0.351"**	**0.351"**					
D		**0.358"**	**0.357"**					
E	**0.320"**	**0.321"**	**0.359"**	**0.359"**				
F								
G	**0.359"**	**0.359"**	**0.360"**	**0.359"**				
H		**0.354"**	**0.368"**	**0.353"**				
I		**0.366"**	**0.363"**	**0.362"**				
J		**0.234"**	**0.235"**	**0.235"**				
K	**0.239"**	**0.226"**	**0.222"**	**0.242"**				
L								
M								
N	**0.235"**	**0.235"**	**0.235"**	**0.236"**				
O			**0.237"**	**0.239"**				
P								
Q	**0.229"**	**0.249"**	**0.247"**	**0.247"**				
R	**0.234"**	**0.235"**	**0.233"**	**0.234"**				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

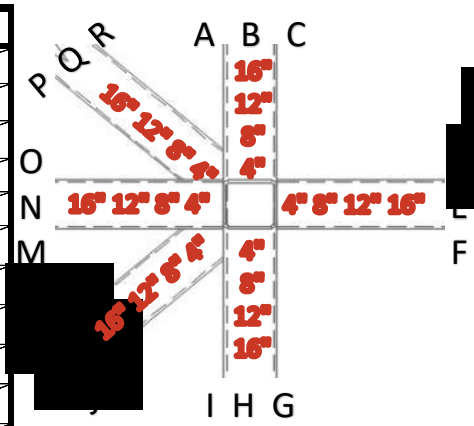
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-5.3-T1-3*** ***Center:*** ***0.353"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.356"**	**0.353"**	**0.355"**	**0.354"**				
C	**0.360"**	**0.337"**	**0.324"**	**0.346"**				
D								
E	**0.342"**	**0.344"**	**0.344"**	**0.344"**				
F								
G								
H	**0.338"**	**0.335"**	**0.335"**	**0.335"**				
I		**0.339"**	**0.337"**	**0.350"**				
J		**0.231"**	**0.231"**	**0.231"**				
K	**0.180"**	**0.207"**	**0.225"**	**0.225"**				
L		**0.236"**	**0.236"**	**0.238"**				
M								
N	**0.250"**	**0.235"**		**0.234"**				
O		**0.239"**	**0.236"**	**0.237"**				
P								
Q	**0.231"**	**0.235"**	**0.235"**	**0.236"**				
R		**0.236"**	**0.237"**	**0.236"**				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

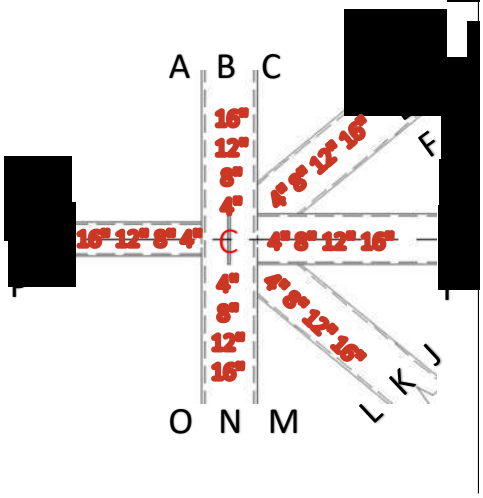
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-5-T1-1*** ***Center:*** ***0.350"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.355"	0.355"	0.435"				
B	0.349"	0.348"	0.347"	0.347"				
C		0.352"	0.354"	0.356"				
D		0.278"	0.288"	0.287"				
E	0.118"	0.270"	0.279"	0.269"	0.273"			
F			0.267"	0.269"				
G			0.274"	0.260"				
H	0.288"	0.260"	0.262"	0.262"				
I								
J								
K	0.253"	0.267"	0.257"	0.267"				
L		0.263"	0.264"					
M								
N	0.349"	0.352"	0.351"	0.326"				
O								
P		0.405"	0.399"	0.371"	0.376"			
Q	0.420"	0.418"	0.372"	0.365"	0.371"	0.373"		
R		0.378"	0.374"	0.378"				

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

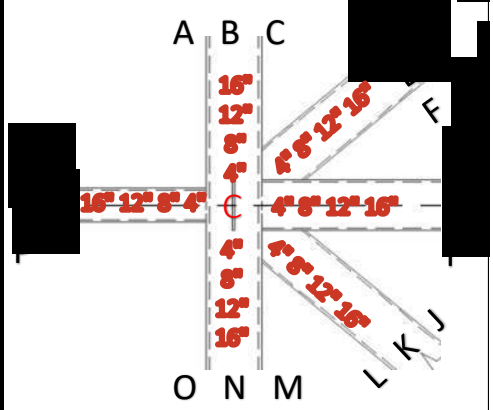
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-5-T1-2*** ***Center:*** ***0.123"***

	4"	8"	12"	16"	20"	24"	28"	32"
A	0.365"	0.385"	0.388"	0.390"				
B	0.365"	0.387"	0.385"	0.376"	0.378"			
C								
D	0.262"	0.266"	0.260"	0.266"				
E	0.247"	0.253"	0.253"					
F		0.257"	0.254"	0.254"				
G		0.263"	0.269"					
H	0.273"	0.268"	0.261"	0.264"				
I								
J		0.269"	0.278"	0.275"				
K	0.155"	0.274"	0.276"	0.268"				
L								
M			0.395"	0.398"	0.392"	0386"		
N	0.381"			0.388"	0.364"	0.346"	0.371"	
O								
P								
Q	0.373"	0.373"	0.374"	0.369"				
R		0.395"	0.383"	0.386"				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

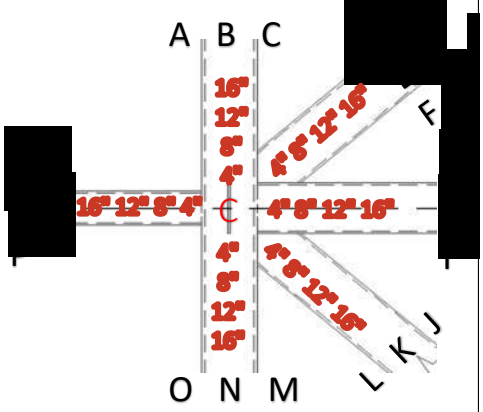
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-5-T1-3*** ***Center:*** ***0.390"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.392"		0.404"				
B	0.389	0.393"	0.381"	0.376"	0.380"			
C			0.404"	0.404"	0.405"	0.391"		
D			0.274"	0.273"				
E	0.269"	0.272"	0.267"	0.266"				
F								
G			0.285"	0.273"				
H	0.277"	0.285"	0.266"	0.273"	0.271"			
I		0.260"	0.250"	0.269"				
J		0.280"	0.264"	0.257"				
K	0.269"	0.272"	0.265"	0.258"				
L			0.265"	0.266"				
M								
N	0.380"	0.386"	0.365"	0.385"	0.384"			
O		0.357"		0.390"	0.371"	0.396"		
P			0.389"	0.388"				
Q		0.379"	0.378"	0.379"	0.371"			
R	0.377"	0.398"	0.379"	0.379"				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

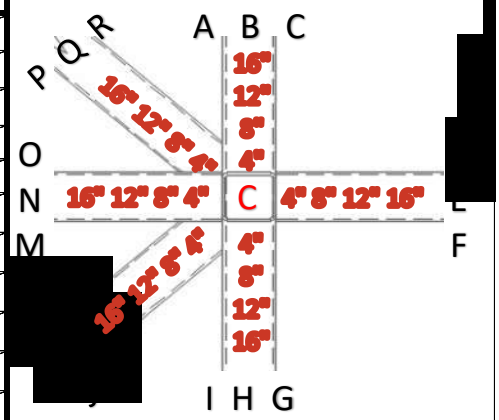
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-6.3-T1-1*** ***Center:*** ***0.149"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		**0.357"**	**0.357"**	**0.354"**				
B	**0.355"**	**0.353"**	**0.353"**	**0.353"**				
C			**0.354"**	**0.355"**				
D								
E	**0.339"**	**0.344"**	**0.345"**	**0.345"**				
F		**0.318"**	**0.312"**	**0.320"**	**0.350"**			
G		**0.340"**	**0.341"**					
H	**0.354"**	**0.354"**	**0.354"**	**0.354"**				
I								
J	**0.241"**	**0.241"**	**0.239"**	**0.234"**				
K	**0.251"**	**0.235"**	**0.235"**	**0.235"**				
L								
M								
N	**0.234"**	**0.236"**	**0.235"**	**0.235"**				
O		**0.238"**	**0.237"**	**0.237"**				
P								
Q		**0.236"**	**0.238"**	**0.237"**	**0.232"**	**0.234"**		
R		**0.243"**	**0.242"**	**0.241"**				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

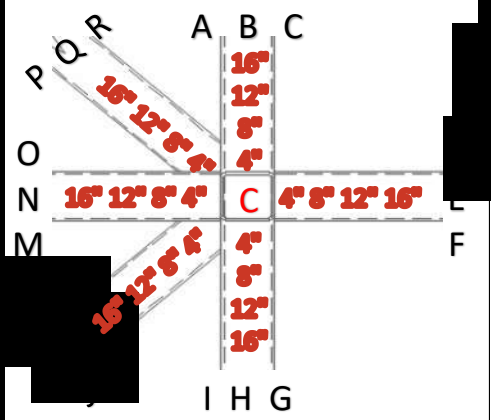
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-6.3-T1-2*** ***Center:*** ***0.356"***

	4"	8"	12"	16"	20"	24"	28"	32"
A			0.358"					
B	0.355"	0.355"	0.354"	0.354"				
C	0.357"	0.360"	0.359"	0.358"				
D								
E	0.343"	0.346"	0.345"	0.341"				
F	0.318"	0.320"	0.319"	0.317"	0.328"	0.322"		
G	0.359"	0.358"	0.358"	0.358"				
H	0.355"	0.355"	0.355"	0.354"				
I								
J			0.232"	0.231"	0.234"			
K	0.230"	0.230"	0.230"	0.231"				
L		0.231"	0.231"	0.233"				
M	0.238"	0.240"	0.242"	0.241"				
N	0.203"	0.246"	0.245"	0.249"				
O	0.242"	0.240"	0.242"	0.241"				
P			0.231"	0.235"				
Q	0.228"	0.225"	0.233"	0.233"				
R	0.238"	0.235"	0.236"	0.233"				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

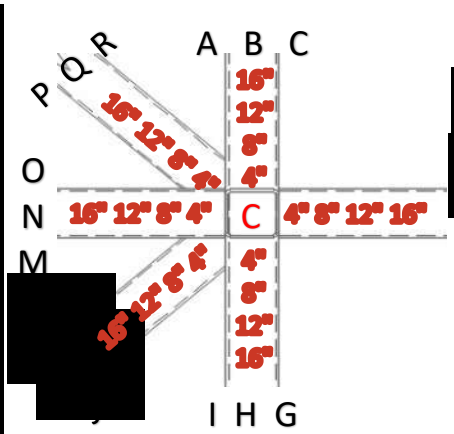
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-6.3-T1-3*** ***Center:*** ***0.254"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.359"						
B	0.355"	0.355"	0.354"	0.354"				
C		0.357"	0.357"	0.357"				
D								
E	0.322"	0.342"	0.340"	0.341"				
F								
G	0.335"	0.327"	0.357"	0.350"				
H	0.355"	0.354"	0.354"	0.354"				
I		0.357"	0.357"	0.357"				
J		0.223"	0.234"	0.231"				
K	0.222"	0.224"	0.227"	0.226"				
L								
M		0.234"	0.234"	0.235"				
N	0.234"	0.234"	0.234"	0.234"				
O								
P								
Q	0.229"	0.234"	0.234"	0.234"				
R		0.236"	0.234"	0.235"				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

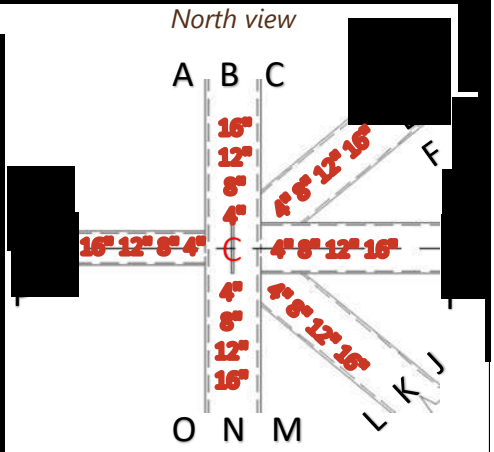
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

Location: ***B-6-T1-1*** ***Center:*** ***0.114"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.355"**	**0.354"**	**0.354"**	**0.355"**				
C		**0.358"**	**0.353"**	**0.337"**	**0.363"**			
D		**0.227"**	**0.223"**	**0.233"**				
E	**0.220"**	**0.225"**	**0.225"**	**0.227"**	**0.226"**			
F								
G			**0.239"**	**0.239"**				
H	**0.235"**	**0.235"**	**0.235"**	**0.235"**				
I								
J			**0.236"**	**0.240"**				
K	**0.233"**	**0.233"**	**0.234"**	**0.236"**				
L	**0.237"**	**0.238"**	**0.240"**	**0.238"**				
M								
N	**0.353"**	**0.353"**	**0.354"**	**0.354"**				
O	**0.335"**	**0.320"**	**0.327"**					
P	**0.354"**	**0.345"**	**0.349"**	**0.348"**				
Q	**0.239"**	**0.336"**	**0.346"**	**0.346"**				
R	**0.335"**	**0.336"**	**0.334"**	**0.352"**				

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

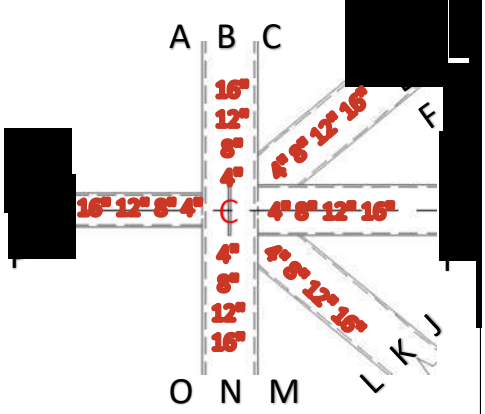
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-6-T1-2*** ***Center:*** ***0.333"***

	4"	8"	12"	16"	20"	24"	28"	32"
A	**0.353"**	**0.354"**	**0.359"**	**0.358"**				
B	**0.334"**	**0.329"**	**0.333"**	**0.335"**				
C								
D								
E	**0.214"**	**0.234"**	**0.234"**	**0.234"**				
F		**0.234"**	**0.234"**	**0.233"**				
G		**0.237"**	**0.236"**	**0.238"**				
H	**0.231"**	**0.231"**	**0.231"**	**0.231"**				
I		**0.231"**	**0.231"**	**0.232"**				
J		**0.240"**	**0.236"**	**0.239"**				
K	**0.236"**	**0.234"**	**0.234"**	**0.239"**				
L								
M		**0.340"**	**0.349"**	**0.349"**				
N	**0.353"**	**0.352"**	**0.353"**	**0.352"**				
O		**0353"**	**0.355"**	**0.353"**				
P								
Q	**0.340"**	**0.342"**	**0.342"**	**0.342"**				
R								

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

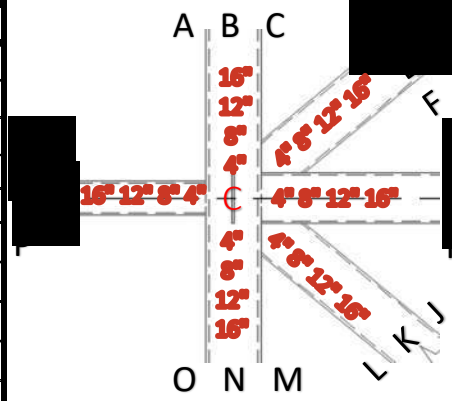
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-6-T1-3*** ***Center:*** ***0.352"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.353"**	**0.355"**	**0.354"**	**0.354"**				
C		**0.358"**	**0.359"**	**0.357"**				
D		**0.225"**	**0.227"**	**0.227"**				
E	**0.232"**	**0.233"**	**0.233"**	**0.233"**				
F		**0.233"**						
G		**0.239"**	**0.238"**	**0.239"**				
H	**0.232"**	**0.232"**	**0.233"**	**0.233"**				
I		**0.232"**	**0.231"**	**0.231"**				
J		**0.236"**	**0.240"**	**0.239"**				
K	**0.211"**	**0.234"**	**0.234"**	**0.234"**				
L		**0.236"**	**0.236"**	**0.236"**				
M		**0.355"**	**0.357"**					
N	**0.353"**	**0.354"**	**0.354"**	**0.354"**				
O		**0.359"**	**0.357"**	**0.359"**				
P								
Q	**0.330"**	**0.343"**	**0.343"**	**0.343"**				
R								

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

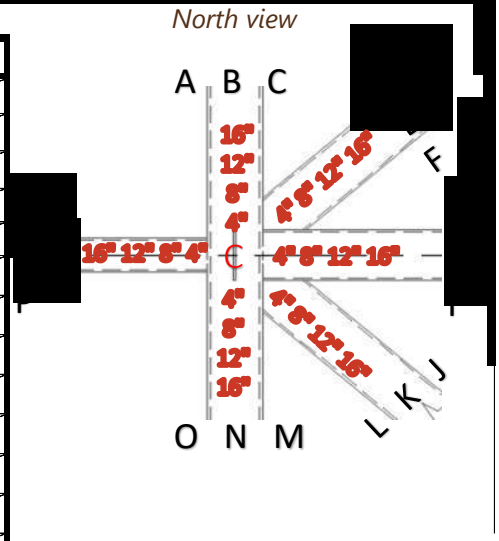
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-7-T1-1*** ***Center:*** ***0.364"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.359"	0.359"	0.359"				
B	0.347"	0.354"	0.353"	0.353"				
C		0.358"						
D								
E	0.186"	0.231"	0.233"	0.233"				
F		0.246"	0.241"	0.242"				
G		0.232"	0.233"	0.234"				
H	0.229"	0.219"	0.222"	0.233"				
I			0.232"					
J								
K	0.236"	0.235"	0.235"	0.235"				
L	0.236"	0.236"	0.236"	0.236"				
M		0.357"	0.357"	0.356"				
N	0.354"	0.356"	0.353"	0.353"				
O								
P	0.350"	0.348"	0.333"	0.344"				
Q	0.336"	0.322"	0.344"	0.344"				
R		0.346"						

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

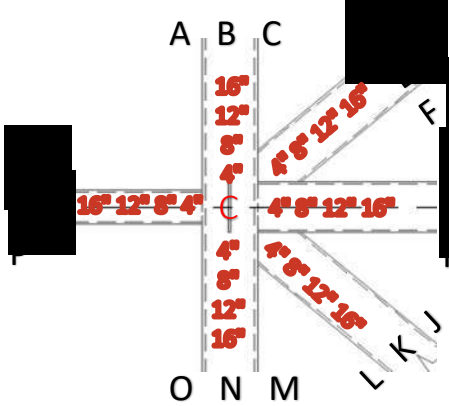
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-7-T1-2*** ***Center:*** ***0.331"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	0.329"	0.330"	0.328"	0.353"	0.354"			
C		0.357"	0.359"					
D			0.243"	0.242"				
E	0.213"	0.234"	0.234"	0.234"				
F		0.240"	0.242"	0.239"				
G		0.235"	0.234"	0.234"				
H	0.227"	0.230"	0.230"	0.230"				
I		0.231"	0.232"	0.231"				
J		0.232"	0.237"	0.236"				
K	0.233"	0.237"	0.238"	0.241"				
L	0.241"	0.240"	0.240"	0.240"				
M		0.356"	0.356"	0.356"				
N	0.354"	0.353"	0.353"	0.353"				
O		0.354"	0.358"	0.357"				
P								
Q	0.167"	0.344	0.344"	0.343"				
R		0.346"						

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

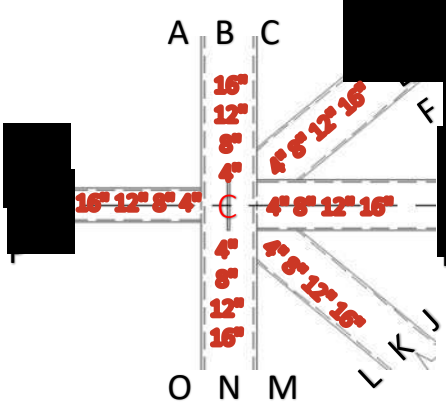
Project #:	23050318	Report Date:	10-11-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***B-7-T1-3*** ***Center:*** ***0.331"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.360"	0.360"	0.360"				
B	0.355"	0.355"	0.354"	0.354"				
C		0.358"	0.358"	0.358"				
D		0.229"	0.228"	0.229"				
E	0.201"	0.226"	0.226"	0.226"				
F			0.230"	0.232"				
G		0.238"	0.236"					
H	0.230"	0.233"	0.233"	0.233"				
I		0.240"	0.240"	0.242"				
J								
K	0.226"	0.234"	0.234"	0.234"				
L	0.238"	0.237"	0.237"	0.238"				
M		0.357"	0.330"	0.329"				
N	0.354"	0.354"	0.354"	0.353"				
O		0.325"	0.327"	0.325"				
P								
Q	0.334"	0.340"	0.341"	0.342"				
R								

North view



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Larry Jernigan	UT Level II		10-11-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

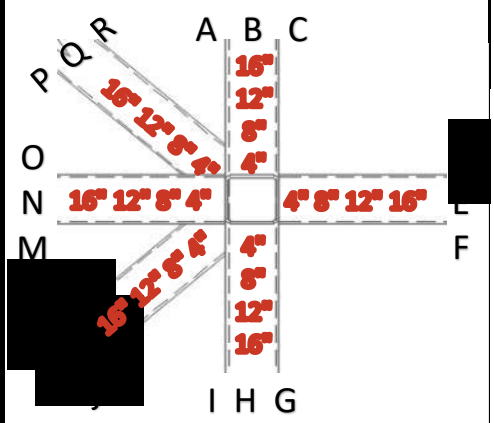
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-8.3-T1-1*** ***Center:*** ***0.353"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.353"**	**0.353"**	**0.353"**	**0.355"**				
C	**0.363"**	**0.362"**	**0.363"**	**0.363"**				
D		**0.240"**	**0.247"**	**0.246"**				
E	**0.232"**	**0.232"**	**0.233"**	**0.233"**				
F								
G								
H	**0.223"**	**0.233"**	**0.233"**	**0.233"**				
I		**0.244"**	**0.234"**	**0.234"**				
J								
K	**0.230"**	**0.231"**	**0.230"**	**0.230"**				
L		**0.238"**	**0.239"**	**0.240"**				
M								
N	**0.353"**	**0.354"**	**0.354"**	**0.354"**				
O	**0.358"**	**0.358"**	**0.342"**	**0.342"**				
P	**0.352"**	**0.347"**	**0.354"**	**0.354"**				
Q	**0.343"**	**0.341"**	**0.344"**	**0.344"**				
R								

North view



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

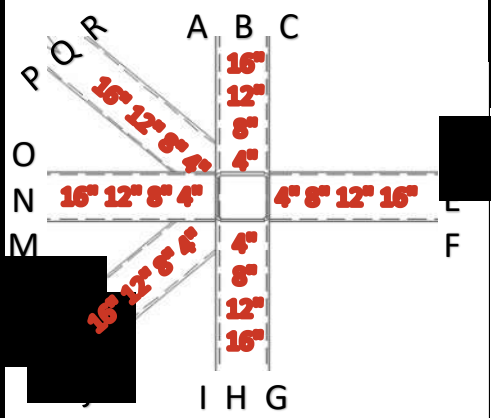
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-8.3-T1-2*** ***Center:*** ***0.351"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.351"**	**0.350"**	**0.350"**	**0.351"**				
C	**0.353"**	**0.352"**	**0.353"**	**0.353"**				
D								
E	**0.300"**	**0.341"**	**0.342"**	**0.343"**				
F								
G								
H	**0.351"**	**0.352"**	**0.351"**	**0.352"**				
I	**0.356"**	**0.357"**	**0.357"**	**0.356"**				
J		**0.236"**	**0.238"**	**0.238"**				
K	**0.233"**	**0.232"**	**0.233"**	**0.233"**				
L			**0.234"**	**0.234"**				
M								
N	**0.234"**	**0.233"**	**0.233"**	**0.233"**				
O		**0.238"**	**0.238"**	**0.238"**				
P								
Q	**0.211"**	**0.228"**	**0.229"**	**0.222"**	**0.232"**	**0.232"**		
R		**0.242"**	**0.242"**	**0.240"**				

North view



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

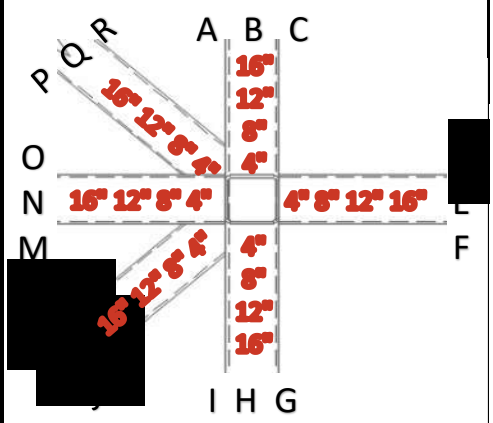
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-8.3-T1-3*** ***Center:*** ***0.351"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	0.351"	0.351"	0.352"	0.352"				
C		0.353"	0.355"	0.355"				
D	0.325"	0.330"	0.352"	0.355"	0.350"			
E	0.325"	0.339"	0.325"	0.331"	0.330"			
F								
G								
H	0.351"	0.350"	0.351"	0.352"				
I								
J								
K	0.233"	0.235"	0.236"	0.235"				
L		0.237"	0.237"	0.234"				
M		0.233"	0.241"	0.241"	0.241"			
N	0.232	0.231"	0.241"	0.242"				
O								
P								
Q	0.236"	0.231"	0.223"	0.234"	0.232"	0.232"		
R			0.240"	0.238"				

North view



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

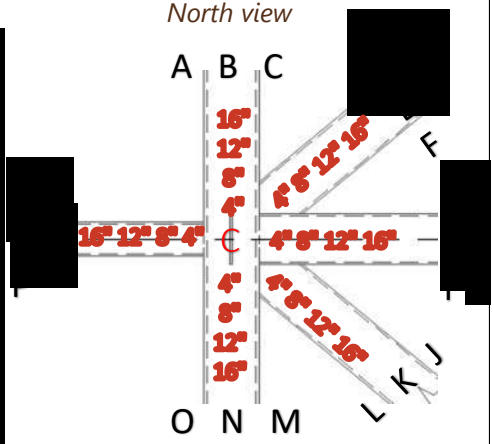
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-8-T1-1*** ***Center:*** ***0.350"***

	4"	8"	12"	16"	20"	24"	28"	32"
A	**0.358"**	**0.357"**		**0.356"**				
B	**0.351"**	**0.351"**	**0.351"**	**0.351"**				
C		**0.355"**	**0.355"**	**0.355"**				
D								
E	**0.336"**	**0.337"**	**0.333"**	**0.327"**				
F	**0.349"**	**0.346"**	**0.348"**	**0.350"**				
G	**0.255"**	**0.258"**	**0.256"**	**0.256"**				
H	**0.251"**	**0.251"**	**0.250"**	**0.250"**				
I		**0.254"**	**0.253"**	**0.255"**				
J		**0.243"**	**0.242"**	**0.243"**				
K	**0.226"**	**0.232"**	**0.232"**	**0.232"**				
L								
M								
N	**0.232"**	**0.233"**	**0.233"**	**0.232"**				
O			**0.235"**	**0.235"**				
P		**0.240"**	**0.238"**	**0.236"**				
Q	**0.235"**	**0.236"**	**0.236"**	**0.235"**				
R		**0.238"**	**0.238"**	**0.236"**				

North view



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

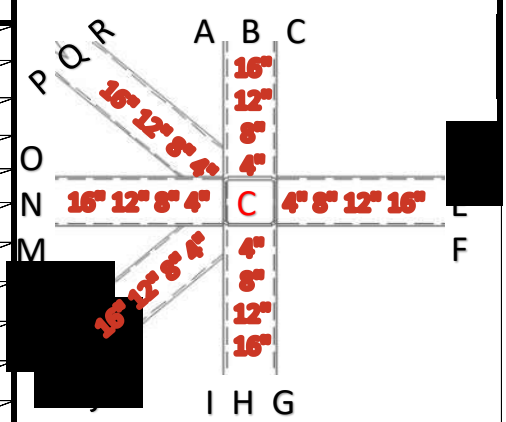
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-9.3-T1-1*** ***Center:*** ***0.295"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.348"**	**0.348"**	**0.348"**	**0.348"**				
C	**0.355"**	**0.355"**	**0.355"**	**0.355"**				
D								
E	**0.334"**	**0.344"**	**0.344"**	**0.344"**				
F	**0.349"**	**0.329"**	**0.338"**	**0.349"**				
G		**0.354"**	**0.355"**	**0.355"**				
H	**0.349"**	**0.349"**	**0.348"**	**0.346"**				
I								
J		**0.239"**	**0.230"**	**0.230"**				
K	**0.222"**	**0.230"**	**0.235"**	**0.233"**				
L								
M	**0.221"**		**0.238"**	**0.237"**				
N	**0.232"**	**0.233"**	**0.234"**	**0.233"**				
O								
P		**0.231"**	**0.241"**					
Q	**0.225"**	**0.230"**	**0.231"**	**0.231"**				
R			**0.237"**	**0.234"**				

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

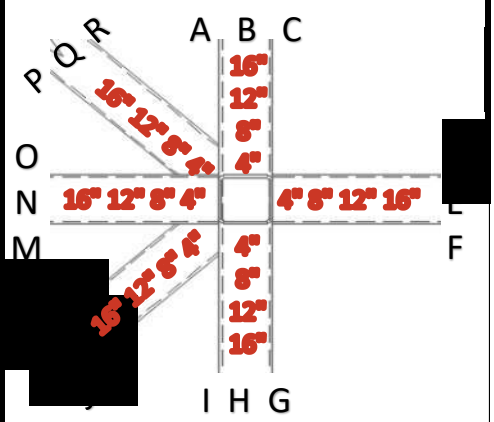
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-9.3-T1-2*** ***Center:*** ***0.347"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.345"**	**0.345"**	**0.345"**	**0.345"**				
C	**0.353"**	**0.353"**	**0.352"**	**0.352"**				
D								
E	**0.325"**	**0.335"**	**0.336"**	**0.334"**				
F								
G		**0.357"**	**0.352"**	**0.353"**				
H	**0.345"**	**0.345"**	**0.346"**	**0.346"**				
I								
J		**0.231"**	**0.233"**	**0.230"**				
K	**0.228"**	**0.229"**	**0.222"**	**0.234"**				
L								
M		**0.237"**		**0.239"**				
N	**0.233"**	**0.232"**	**0.233"**	**0.233"**				
O		**0.237"**						
P								
Q	**0.233"**	**0.232"**	**0.233"**	**0.232"**				
R			**0.240"**	**0.241"**				

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

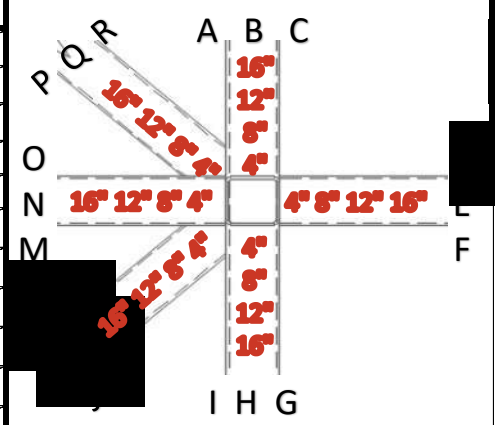
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-9.3-T1-3*** ***Center:*** ***0.345"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.345"**	**0.346"**	**0.345"**	**0.345"**				
C	**0.352"**	**0.351"**	**0.350"**	**0.352"**				
D								
E	**0.344"**	**0.345"**	**0.345"**	**0.344"**				
F								
G	**0.349"**	**0.351"**	**0.351"**	**0.351"**				
H	**0.344"**	**0.346"**	**0.345"**	**0.344"**				
I								
J	**0.235"**	**0.238"**	**0.239"**	**0.232"**				
K		**0.236"**	**0.238"**					
L	**0.233"**	**0.232"**	**0.231"**	**0.232"**				
M								
N	**0.232"**	**0.234"**	**0.235"**	**0.233"**				
O		**0.237"**	**0.238"**					
P								
Q	**0.229"**	**0.231"**	**0.232"**	**0.232"**				
R		**0.240"**	**0.240"**	**0.239"**				

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

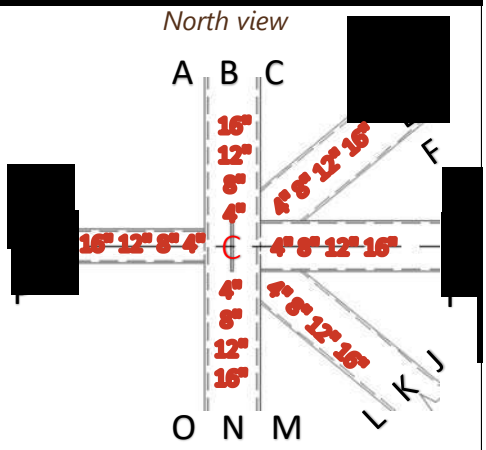
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-9-T1-1*** ***Center:*** ***0.348"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		**0.347"**	**0.358"**	**0.345"**				
B	**0.349"**	**0.349"**	**0.349"**	**0.349"**				
C								
D		**0.236"**	**0.230"**	**0.231"**				
E	**0.239"**	**0.231"**	**0.232"**	**0.230"**				
F		**0.230"**		**0.230"**				
G		**0.236"**	**0.234"**					
H	**0.226"**	**0.231"**	**0.230"**	**0.231"**				
I			**0.234"**					
J								
K	**0.231"**	**0.231"**	**0.231"**	**0.231"**				
L		**0.238"**	**0.236"**	**0.237"**	**0.238"**			
M								
N	**0.349"**	**0.346"**	**0.348"**	**0.348"**				
O		**0.358"**	**0.352"**	**0.351"**				
P	**0.345"**	**0.355"**	**0.350"**	**0.345"**				
Q	**0.302"**	**0.340"**	**0.341"**	**0.340"**				
R								

North view



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

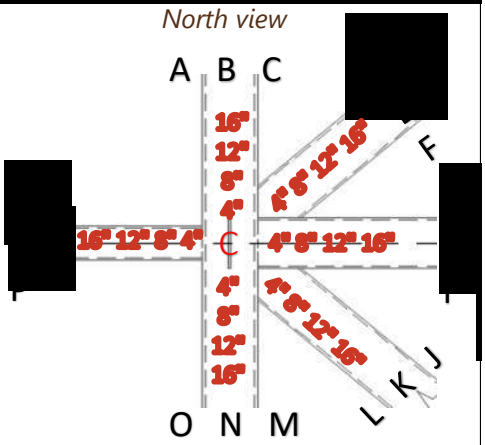
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-9-T1-2*** ***Center:*** ***0.350"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		0.359"	0..361"	0.360"				
B	0.350"	0.350"	0.350"	0.350"				
C								
D		0.237"	0.235"	0.236"				
E	0.239"	0.230"	0.230"	0.230"				
F		0.235"		0.233"				
G								
H	0.234"	0.234"	0.233"	0.233"				
I		0.237"	0.238"					
J								
K	0.231"	0.229"	0.231"	0.231"				
L		0.238"	0.234"	0.238"				
M								
N	0.350"	0.348"	0.349"	0.351"				
O	0.360"	0.359"	0.359"	0.356"				
P								
Q	0.117"	0.341"	0.339"	0.340"	0.340"			
R		0.346"	0.346"	0.346"				

North view



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

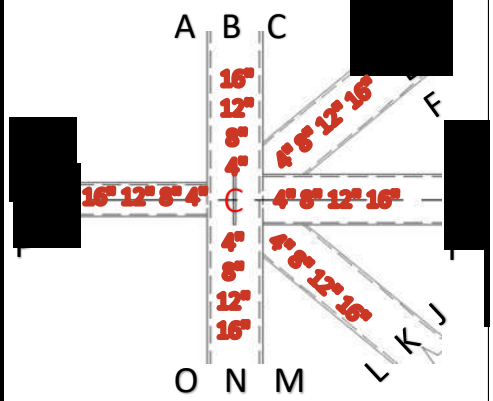
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-9-T1-3*** ***Center:*** ***0.350"***

	4"	8"	12"	16"	20"	24"	28"	32"
A		**0.354"**						
B	**0.348"**	**0.349"**	**0.349"**	**0.349**				
C			**0.349"**	**0.348"**				
D		**0.235"**	**0.235"**	**0.234"**				
E	**0.121"**	**0.232"**	**0.230"**	**0.232"**				
F								
G								
H	**0.230"**	**0.230"**	**0.235"**	**0.232"**				
I		**0.232"**	**0.232"**	**0.232"**				
J		**0.232"**	**0.232"**	**0.232"**				
K	**0.219"**	**0.231"**	**0.232"**	**0.232"**				
L		**0.233"**	**0.233"**	**0.232"**				
M								
N	**0.349"**	**0.349"**	**0.349"**	**0.349"**				
O	**0.358"**	**0.358"**	**0.354"**	**0.354"**				
P								
Q	**0.315"**	**0.333"**	**0.327"**	**0.326"**				
R								

North view



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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

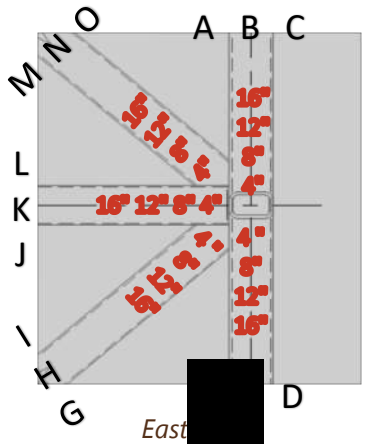
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

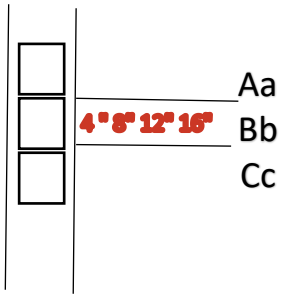
Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B-10.3-T2-1*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.359"**	**0.359"**	**0.359"**	**0.359"**				
C		**0.355"**						
D			**0.356"**	**0.356"**				
E	**0.354"**	**0.355"**	**0.356"**	**0.356"**				
F								
G		**0.222"**	**0.218"**	**0.223"**				
H	**0.215"**	**0.231"**	**0.231"**	**0.230"**				
I								
J		**0.235"**	**0.235"**	**0.235"**				
K	**0.235"**	**0.234"**	**0.234"**	**0.233"**				
L		**0.236"**	**0.235"**	**0.235"**				
M								
N	**0.232"**	**0.232"**	**0.232"**	**0.232"**				
O	**0.239"**	**0.239"**	**0.240"**	**0.240"**				
Aa								
Bb	**0.450"**	**0.450"**	**0.450"**	**0.442"**				
Cc	**0.455"**	**0.455"**	**0.455"**	**0.455"**				

South side view





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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

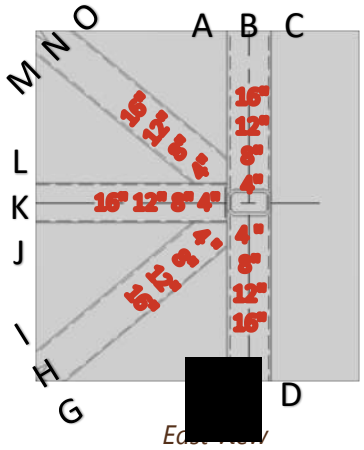
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

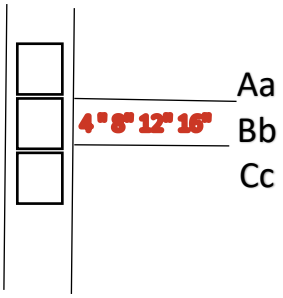
Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B-10.3-T2-2*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.341"**	**0.355"**	**0.357"**	**0.357"**				
C								
D								
E	**0.359"**	**0.359"**	**0.362"**	**0.359"**				
F			**0.359"**	**0.356"**				
G		**0.238"**	**0.238"**	**0.239"**				
H	**0.236"**	**0.236"**	**0.235"**	**0.235"**				
I								
J			**0.234"**	**0.234"**				
K	**0.229"**	**0.231"**	**0.230"**	**0.231"**				
L								
M								
N	**0.236"**	**0.233"**	**0.232"**	**0.232"**				
O		**0.239"**	**0.238"**	**0.239"**				
Aa								
Bb	**0.457"**	**0.460"**	**0.460"**	**0.459"**				
Cc								

North view





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Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

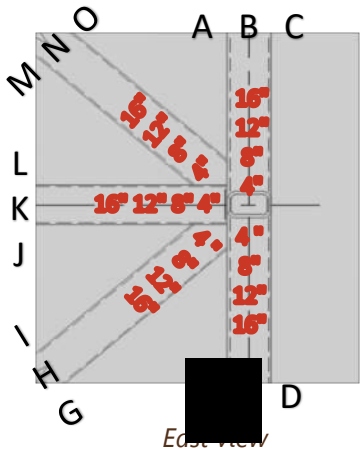
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

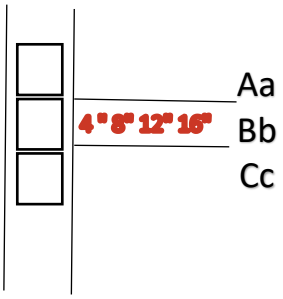
Location: ***B-10.3-T2-3*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.359"**	**0.359"**	**0.359"**	**0.359"**				
C								
D								
E	**0.366"**	**0.337"**	**0.336"**	**0.356"**				
F								
G								
H	**0.231"**	**0.231"**	**0.231"**	**0.230"**				
I		**0.231"**	**0.237"**	**0.235"**				
J		**0.231"**	**0.231"**	**0.233"**				
K	**0.227"**	**0.233"**	**0.232"**	**0.233"**				
L		**0.238"**	**0.232"**	**0.232"**				
M		**0.240"**	**0.241"**	**0.240"**				
N	**0.233"**	**0.233"**	**0.233"**	**0.233"**				
O								
Aa								
Bb	**0.422"**	**0.447"**	**0.466"**	**0.448"**				
Cc	**0.478"**	**0.478"**	**0.478"**	**0.476"**				

North view



East view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

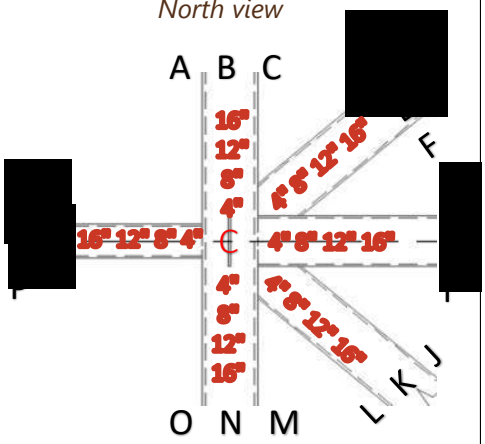
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B-10-T1-1*** ***Center:*** ***0.350"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.329"**	**0.350"**	**0.350"**	**0.350"**				
C		**0.354"**	**0.356"**	**0.354"**				
D			**0.238"**	**0.238"**				
E	**0.234"**	**0.239"**	**0.235"**	**0.235"**				
F								
G								
H	**0.233"**	**0.233"**	**0.233"**	**0.233"**				
I		**0.234"**	**0.234"**					
J								
K	**0.229"**	**0.232"**	**0.232"**	**0.232"**				
L	.	**0.233"**	**0.238"**	**0.235"**				
M								
N	**0.249"**	**0.250"**	**0.249"**	**0.248"**				
O	**0.251"**	**0.251"**	**0.252"**	**0.252"**				
P								
Q	**0.344"**	**0.344"**	**0.344"**	**0.344"**				
R	**0.345"**	**0.343"**	**0.346"**	**0.346"**				

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

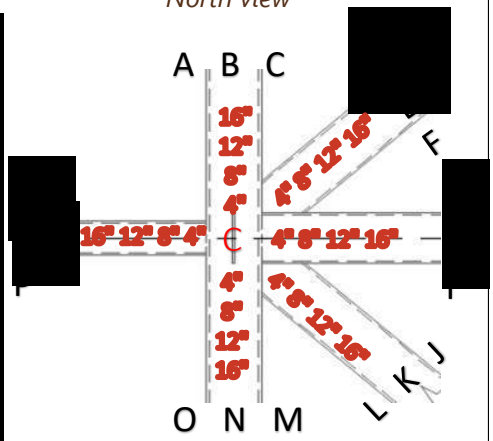
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***B-10-T1-2*** ***Center:*** ***0.347"***

	4"	8"	12"	16"	20"	24"	28"	32"
A			**0.354"**	**0.353"**				
B	**0.349"**	**0.350"**	**0.350"**	**0.350"**				
C			**0.354"**	**0.354"**				
D		**0.239"**	**0.238"**					
E	**0.228"**	**0.220"**	**0.231"**	**0.233"**				
F		**0.236"**	**0.236"**	**0.237"**				
G								
H	**0.229"**	**0.231"**	**0.231"**	**0.231"**				
I			**0.235"**	**0.234"**				
J			**0.230"**	**0.230"**				
K	**0.208"**	**0.234"**	**0.234"**	**0.232"**				
L	.	**0.240"**	**0.235"**	**0.238"**				
M								
N	**0.349"**	**0.348"**	**0.349"**	**0.349"**				
O		**0.353"**	**0.356"**	**0.354"**				
P								
Q	**0.330"**	**0.323"**	**0.329"**	**0.325"**				
R								

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

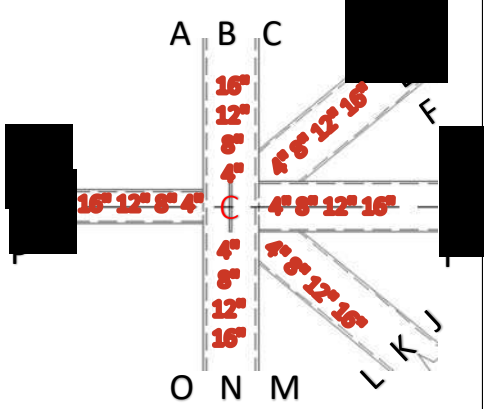
Project #:	23050318	Report Date:	10-12-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

Location: ***B-10-T1-3*** ***Center:*** ***0.347"***

	4"	8"	12"	16"	20"	24"	28"	32"
A			**0.354"**	**0.353"**				
B	**0.347"**	**0.347"**	**0.349"**	**0.349"**				
C								
D			**0.216"**	**0.244"**				
E	**0.234"**	**0.221"**	**0.233"**	**0.234"**				
F								
G								
H	**0.231"**	**0.233"**	**0.233"**	**0.233"**				
I			**0.231"**	**0.231"**				
J		**0.240"**	**0.240"**	**0.242"**				
K	**0.231"**	**0.232"**	**0.231"**	**0.232"**				
L	.		**0.234"**	**0.236"**				
M			**0.352"**	**0.354"**				
N	**0.347"**	**0.347"**	**0.347"**	**0.348"**				
O	**0.352"**							
P								
Q	**0.345"**	**0.342"**	**0.345"**	**0.345"**				
R								

North view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-12-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

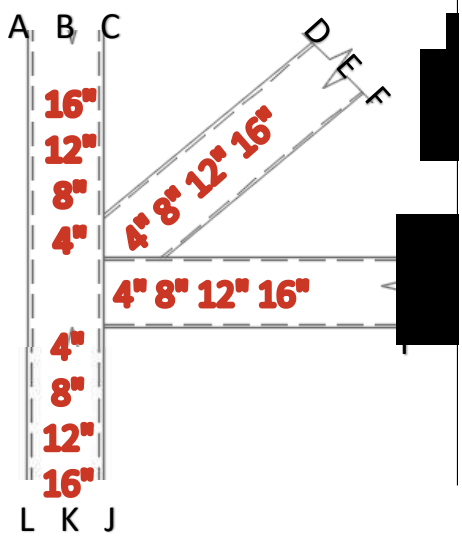
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***D-1.3-T1-1*** ***Center:*** ***(B)0.359"*** ***(A)0.371"***

	4"	8"	12"	16"	20"	24"	28"	32"
A	**0.356"**	**0.356"**	**0.355"**	**0.356"**				
B	**0.363"**	**0.353"**	**0.352"**	**0.353"**				
C		**0.371"**	**0.375"**					
D		**0.238"**	**0.235"**	**0.237"**				
E	**0.202"**	**0.202"**	**0.210"**	**0.243"**				
F								
G								
H	**0.249"**	**0.233"**	**0.233"**	**0.233"**				
I								
J								
K	**0.353"**	**0.357"**	**0.351"**	**0.351"**				
L	**0.356"**	**0.362"**	**0.363"**	**0.366"**				
M								
N								
O								
Aa								
Bb								
Cc								
Dd								

South side view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

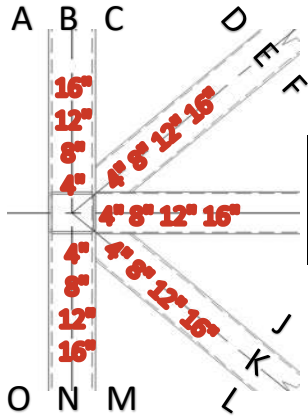
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629		**5**	0.500"
Cable Type:	N/A	Frequency:	7.5			
Cable Length:	48"	Size:	0.25"			

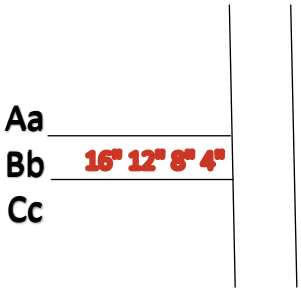
Location: ***D-1.3-T1-4*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.357"**	**0.355"**	**0.356"**	**0.355"**				
C								
D								
E	**0.239"**	**0.234"**	**0.236"**	**0.235"**				
F								
G								
H	**0.185"**	**0.231"**	**0.222"**	**0.224"**				
I								
J								
K	**0.227"**	**0.229"**	**0.228"**	**0.224"**				
L								
M								
N	**0.355"**	**0.356"**	**0.357"**	**0.356"**				
O								
Aa		**0.256"**	**0.302"**	**0.299"**				
Bb	**0.280"**	**0.299"**	**0.295"**	**0.328"**				
Cc	**0.294"**	**0.300"**	**0.315"**	**0.332"**				
Dd								

South side view



East side view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

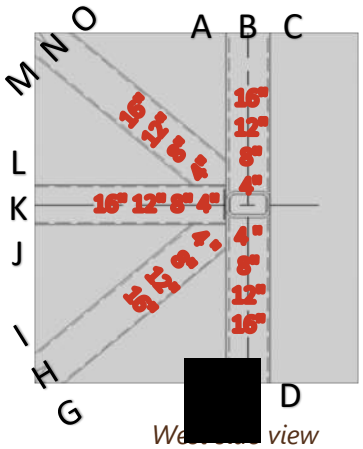
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

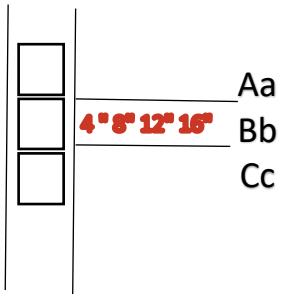
Location: ***D-1-T2-1*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B		**0.363"**	**0.365"**	**0.365"**				
C								
D								
E		**0.360"**	**0.356"**	**0.352"**				
F								
G								
H				**0.232"**	**0.245"**	**0.245"**	**0.241"**	**0.247"**
I								
J								
K			**0.232"**	**0.230"**	**0.229"**	**0.229"**		
L								
M								
N								
O								
Aa								
Bb			**0.436"**	**0.439"**	**0.439"**	**0.452"**		
Cc			**0.449"**	**0.449"**	**0.460"**	**0.460"**		
Dd								

South side view



We[redacted] view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Repiar plate present along the connection, plate thickness 0.375".

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

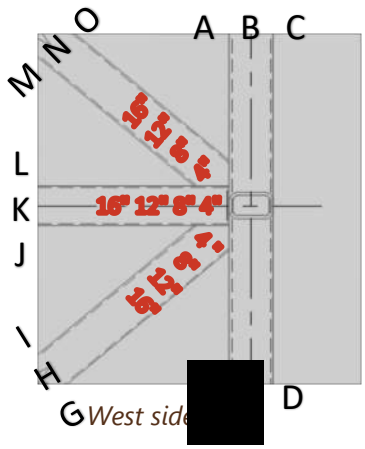
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

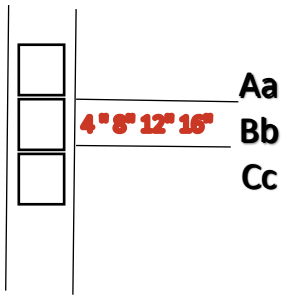
Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***D-1-T2-2*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B								
C								
D								
E								
F								
G								
H	**0.130"**	**0.232"**	**0.230"**	**0.227"**				
I								
J								
K	**0.112"**	**0.229"**	**0.228"**	**0.226"**				
L								
M								
N	**0.126"**	**0.198"**	**0.199"**	**0.198"**				
O								
Aa				**0.450"**				
Bb	**0.430"**	**0.448"**	**0.449"**	**0.450"**				
Cc								
Dd								

South side view





Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

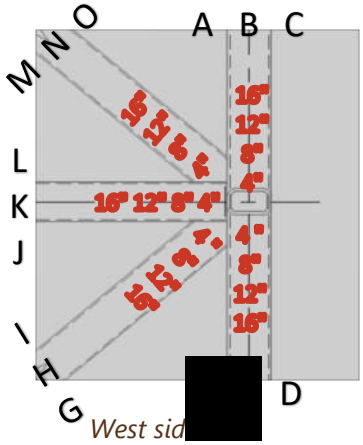
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

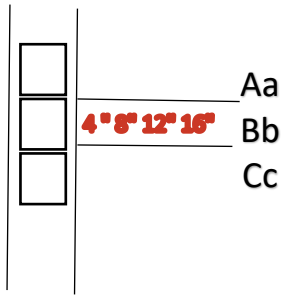
Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***D-1-T2-3*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B								
C								
D								
E								
F								
G								
H	**0.206"**	**0.230"**	**0.229"**	**0.230"**				
I								
J								
K	**0.205"**	**0.229"**	**0.237"**	**0.236"**				
L								
M								
N	**0.212"**	**0.220"**	**0.224"**	**0.223"**				
O								
Aa								
Bb	**0.381"**	**0.464"**	**0.444"**	**0.439"**				
Cc								
Dd								

South side view





Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

**** H&K surfaces has a 1"x3" thourgh wall hole along it corners.***

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

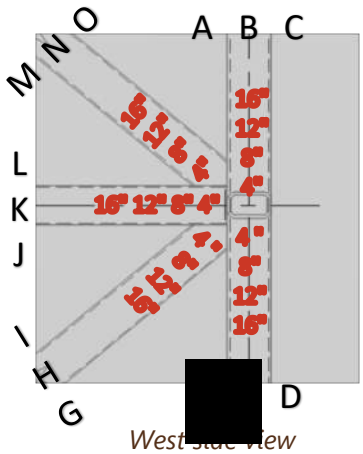
Project #:	23050318	Report Date:	10-9-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	bare

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D7908	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	1159629			**5**	0.500"
Cable Type:	N/A	Frequency:	7.5				
Cable Length:	48"	Size:	0.25"				

Location: ***D-1-T2-4*** ***Center:*** ***N/A***

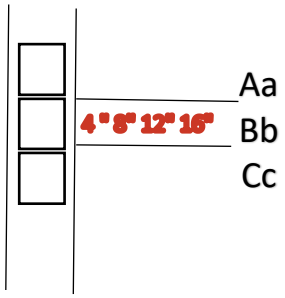
	4"	8"	12"	16"	20"	24"	28"	32"
A								
B								
C								
D								
E								
F								
G								
H	**0.162"**	**0.228"**	**0.228"**	**0.228"**				
I								
J								
K	**0.140"**	**0.208"**	**0.210"**	**0.199"**	**0.230"**	**0.230"**		
L								
M								
N	**0.125"**	**0.229"**	**0.229"**	**0.229"**				
O								
Aa								
Bb	**0.240"**	**0.293"**	**0.275"**	**0.326"**	**0.336"**			
Cc								
Dd								

South side view



[redacted]

West side view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the surface area.

Larry Jernigan	UT Level II		10-9-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

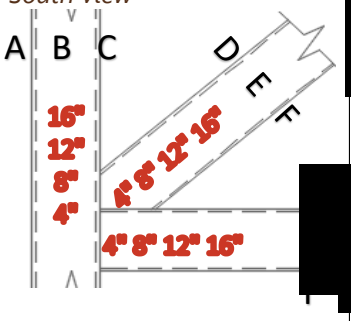
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

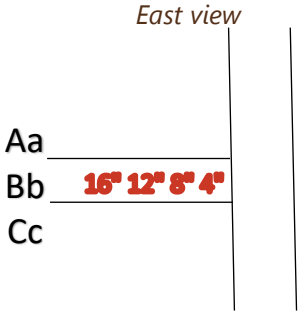
Location: ***D-10.3-T2-1*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B								
C		**0.354"**	**0.354"**	**0.355"**				
D		**0.241"**	**0.243"**	**0.242"**				
E	**0.236"**	**0.236"**	**0.235"**	**0.235"**				
F								
G								
H	**0.228"**	**0.231"**	**0.233"**	**0.232"**				
I	**0.231"**	**0.235"**	**0.230"**	**0.240"**				
J								
K								
L								
M								
N								
O								
Aa								
Bb	**0.460"**	**0.462"**	**0.461"**	**0.461"**				
Cc	**0.443"**	**0.433"**	**0.459"**	**0.447"**				

South view



East view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

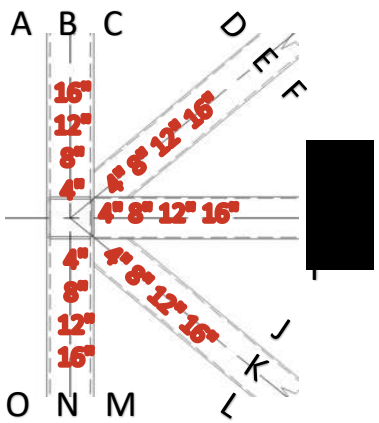
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

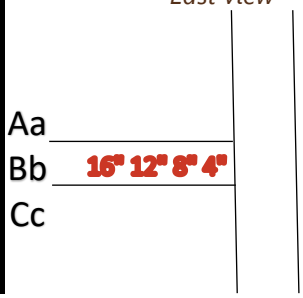
Location: ***D-10.3-T2-2*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B								
C		**0.361"**	**0.362"**	**0.364"**	**0.364"**			
D		**0.237"**	**0.238"**	**0.238"**				
E	**0.207"**	**0.230"**	**0.232"**	**0.232"**				
F								
G			**0.233"**	**0.233"**				
H	**0.232"**	**0.233"**	**0.233"**	**0.233"**				
I			**0.243"**	**0.242"**				
J		**0.233"**		**0.233"**				
K	**0.220"**	**0.231"**	**0.231"**	**0.231"**				
L		**0.234"**	**0.236"**	**0.236"**				
M								
N	**0.364"**		**0.362"**					
O	**0.358"**	**0.356"**	**0.357"**	**0.357"**				
Aa								
Bb	**0.463"**	**0.452"**	**0.463"**	**0.468"**				
Cc								

South view



East view



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Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

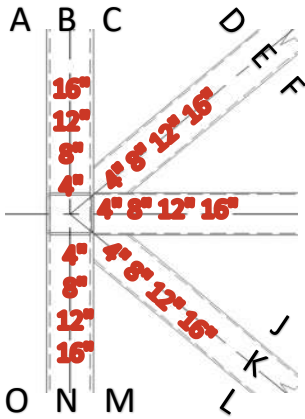
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***D-10.3-T2-3*** ***Center:*** ***N/A***

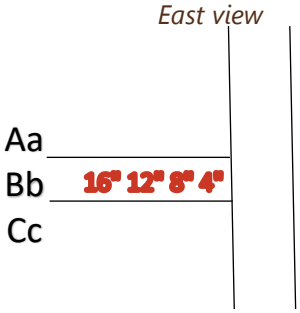
	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.358"**	**0.358"**	**0.358"**	**0.359"**				
C								
D		**0.243"**	**0.244"**	**0.231"**				
E	**0.237"**	**0.237"**	**0.237"**	**0.238"**				
F								
G								
H	**0.234"**	**0.233"**	**0.234"**	**0.234"**				
I		**0.238"**	**0.237"**	**0.236"**				
J								
K	**0.235"**	**0.236"**	**0.236"**	**0.235"**				
L			**0.242"**	**0.243"**	**0.247"**			
M								
N								
O								
Aa								
Bb	**0.456"**	**0.454"**	**0.461"**	**0.463"**				
Cc								

South view



[redacted]

East view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

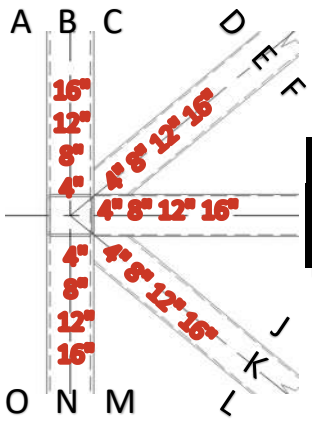
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

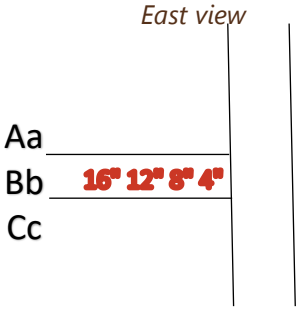
Location: ***D-10.3-T2-4*** ***Center:*** ***N/A***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.360"**	**0.360"**	**0.360"**	**0.360"**				
C								
D		**0.237"**						
E	**0.232"**	**0.233"**	**0.232"**	**0.234"**				
F								
G								
H	**0.232"**	**0.235"**	**0.235"**	**0.234"**				
I		**0.233"**	**0.233"**	**0.233"**				
J								
K	**0.239"**	**0.238"**	**0.239"**	**0.239"**				
L	**0.249"**	**0.239"**	**0.249"**	**0.246"**				
M								
N	**0.361"**	**0.363"**	**0.363"**	**0.359"**				
O								
Aa		**0.299"**	**0.298"**	**0.317"**	**0.322"**			
Bb	**0.294"**	**0.294"**	**0.295"**	**0.315"**	**0.313"**			
Cc								

South view



East view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

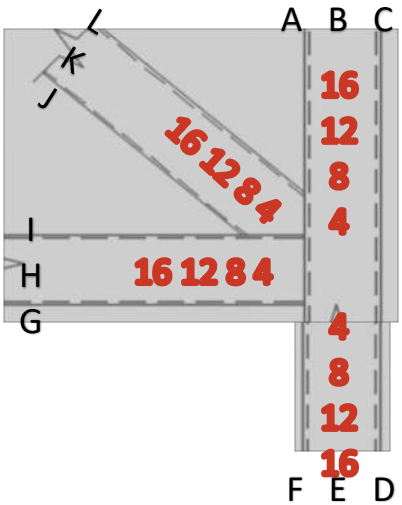
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***D-10-T1-1*** ***Center:*** ***0.347"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.348"**	**0.349"**	**0.349"**	**0.348"**				
C	**0.352"**	**0.351"**	**0.350"**	**0.350"**				
D								
E	**0.347"**	**0.348"**	**0.348"**	**0.349"**				
F	**0.349"**	**0.352"**	**0.352"**	**0.352"**				
G		**0.228"**	**0.232"**	**0.231"**				
H	**0.231"**	**0.231"**	**0.233"**	**0.232"**				
I								
J								
K	**0.283"**	**0.234"**	**0.232"**	**0.233"**				
L		**0.238"**	**0.235"**	**0.237"**				
M								
N								
O								
Aa								
Bb								
Cc								

South view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

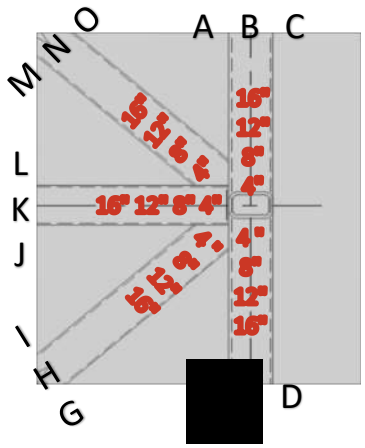
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***D-10-T1-2*** ***Center:*** ***0.347"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.348"**	**0.348"**	**0.349"**	**0.348"**				
C	**0.351"**	**0.351"**	**0.351"**	**0.352"**				
D	**0.349"**	**0.349"**	**0.350"**	**0.350"**				
E	**0.346"**	**0.347"**	**0.343"**	**0.348"**				
F								
G		**0.237"**	**0.236"**	**0.234"**				
H	**0.234"**	**0.236"**	**0.234"**	**0.234"**				
I								
J		**0.235"**	**0.235"**	**0.235"**				
K	**0.230"**	**0.231"**	**0.232"**	**0.232"**				
L		**0.242"**	**0.243"**	**0.243"**				
M								
N	**0.231"**	**0.218"**	**0.234"**	**0.232"**				
O		**0.237"**	**0.236"**	**0.235"**				
Aa								
Bb								
Cc								

South view



Notes: Some faces of the HSS members could not have thicknesses retrieved due to window framing covering the and/or due to thickness of epoxy coating along the surface areas.

Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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Form No TR-NDT-UT
Revision No. 0

ULTRASONIC EXAMINATION THICKNESS REPORT

ASME

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

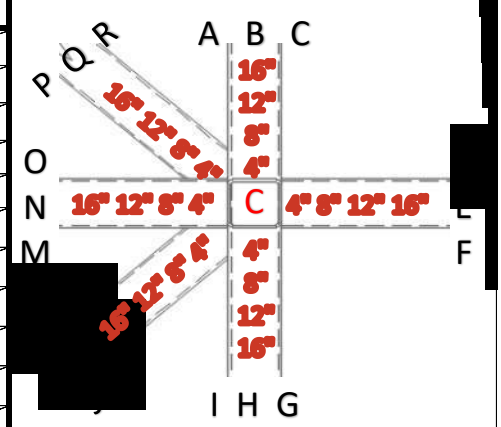
Project #:	23050318	Report Date:	10-13-23
Project Name:	Clearwater Natatorium UTT of structure framing	Procedure No.	TR-NDT-UT-2
Project Location:	Clearwater, FL	Material Type:	**CS**
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)			
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material:	CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No:	988285	1	0.100"
Serial No:	110194505	Serial No.:	754080			**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz				
Cable Length:	48"	Size:	7.9mm				

Location: ***D-10-T1-3*** ***Center:*** ***0.347"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B	**0.347"**	**0.347"**	**0.347"**	**0.347"**				
C	**0.348"**	**0.350"**	**0.352"**	**0.350"**				
D	**0.349"**	**0.350"**	**0.350"**	**0.351"**				
E	**0.348"**	**0.348"**	**0.349"**	**0.349"**				
F								
G		**0.231"**	**0.230"**	**0.230"**				
H	**0.224"**	**0.232"**	**0.235"**	**0.234"**				
I								
J		**0.237"**	**0.236"**	**0.236"**				
K	**0.232"**	**0.234"**	**0.234"**	**0.235"**				
L								
M								
N	**0.217"**	**0.234"**	**0.234"**	**0.232"**				
O		**0.245"**	**0.244"**	**0.239"**				
Aa								
Bb								
Cc								

South view



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Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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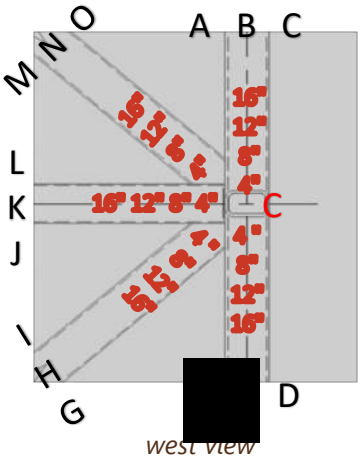
Client Name:	McKim & Creed	Surface Condition:	Painted

Ultrasonic Flaw Detector		Search Unit(s)		Calibration Standard(s)		
Manufacturer:	Olympus	Manufacturer:	Panmetric	Material: CS	Step #	Thickness
Model No.:	DL38	Model No.:	D790-SM	Serial No: 988285	1	0.100"
Serial No:	110194505	Serial No.:	754080		**5**	0.500"
Cable Type:	N/A	Frequency:	5 MHz			
Cable Length:	48"	Size:	7.9mm			

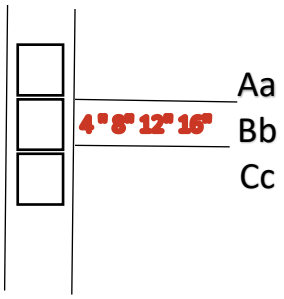
Location: ***D-10-T1-4*** ***Center:*** ***(C)0.352"***

	4"	8"	12"	16"	20"	24"	28"	32"
A								
B		0.348"	0.349"	0.349"	0.349"			
C	0.355"	0.352"	0.352"	0.352"				
D	0.352"	0.357"	0.352"	0.352"	0.352"			
E	0.347"	0.347"	0.348"	0.348"				
F								
G		0.245"	0.243"	0.244"				
H	0.240"	0.241"	0.241"	0.241"				
I								
J			0.235"	0.235"				
K	0.233"	0.233"	0.234"	0.234"				
L			0.235"					
M								
N	0.233"	0.233"	0.232"	0.232"				
O		0.241"	0.241"	0.240"				
Aa	0.292"	0.294"	0.287"	0.309"				
Bb	0.295"	0.294"	0.309"	0.306"				
Cc	0.282"	0.282"	0.304"	0.307"				

South view



west view



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Larry Jernigan	UT Level II		10-13-23
Technician Name	*Level/Certification*	*Signature*	*Date*

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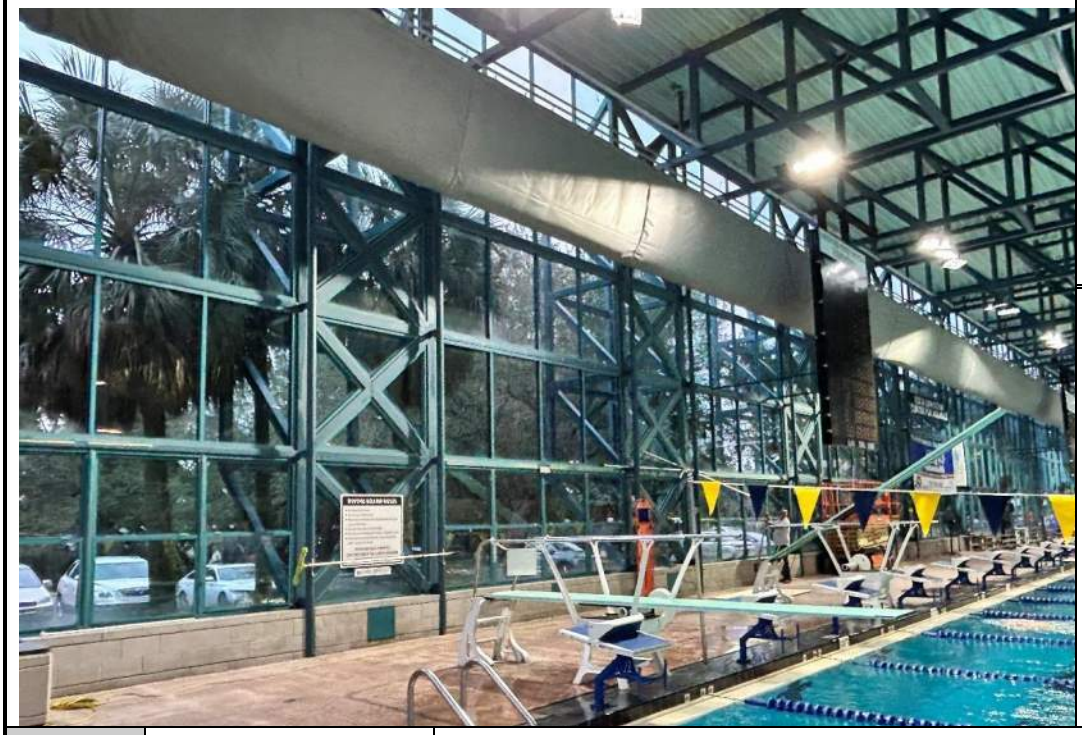
Appendix II– **Photolog**

Date: 10-11-23

Photographer: Larry Jernigan

1	**Location / Orientation**	West wall
	Remarks	



Date: 10-11-23

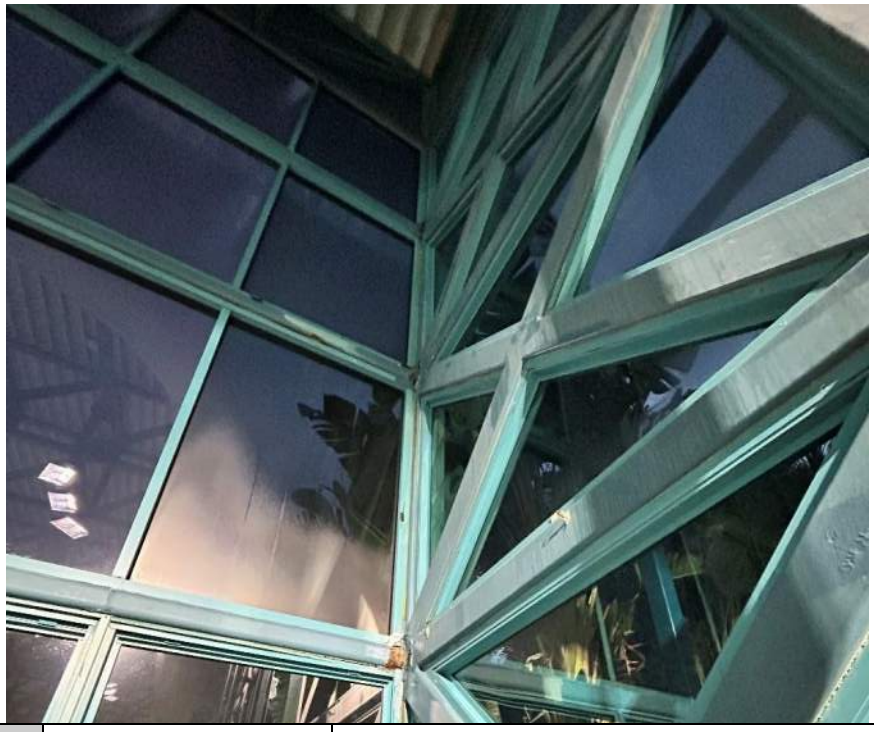
Photographer: Larry Jernigan

2	**Location / Orientation**	North wall
	Remarks	

Date: 10-11-23

Photographer: Larry Jernigan

3	**Location / Orientation**	East Wall
	Remarks	



Date: 10-9-23

Photographer: Larry Jernigan

4	**Location / Orientation**	B-1 corner
	Remarks	

Date: 10-9-23

Photographer: Larry Jernigan

5	**Location / Orientation**	B-1-T2-1
	Remarks	

Date: 10-9-23

Photographer: Larry Jernigan

6	**Location / Orientation**	D-1-T2-1
	Remarks	

Date: 10-9-23

Photographer: Larry Jernigan

7	**Location / Orientation**	D-1-T2-2
	Remarks	

Date: 10-9-23

Photographer: Larry Jernigan

8	**Location / Orientation**	D-1-T2-3
	Remarks	

Date: 10-9-23

Photographer: Larry Jernigan

9	**Location / Orientation**	D-1-T2-3
	Remarks	Hole

Date: 10-12-23

Photographer: Larry Jernigan

10	**Location / Orientation**	B-9.3-T1-1
	Remarks	

Date: 10-12-23

Photographer: Larry Jernigan

11	**Location / Orientation**	B-10_10.3 truss joints
	Remarks	

Date: 10-12-23

Photographer: Larry Jernigan

12	**Location / Orientation**	B-10_10.3 truss joints
	Remarks	

Appendix III– **Structural Frame Repair Drawings**

SHEET INDEX

SHEET #	SHEET DESCRIPTION
GENERAL	COVERSHEET
S0.00	GENERAL NOTES, DESIGN LOADS, DESIGN CRITERIA & LEGEND
S1.00	EXIST BLDG. A ROOF & EXTERIOR WALL FRAMING LAYOUT
S1.01	EXIST. BLDG. A ROOF & EXTR. WALL FRMG. ELEVATIONS (SHT. 1 OF 2)
S1.02	EXIST. BLDG. A ROOF & EXTR. WALL FRMG. ELEVATIONS (SHT. 2 OF 2)
S1.03	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 1 OF 11)
S1.04	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 2 OF 11)
S1.05	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 3 OF 11)
S1.06	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 4 OF 11)
S1.07	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 5 OF 11)
S1.08	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 6 OF 11)
S1.09	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 7 OF 11)
S1.10	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 8 OF 11)
S1.11	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 9 OF 11)
S1.12	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 10 OF 11)
S1.13	EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 11 OF 11)

CLEARWATER

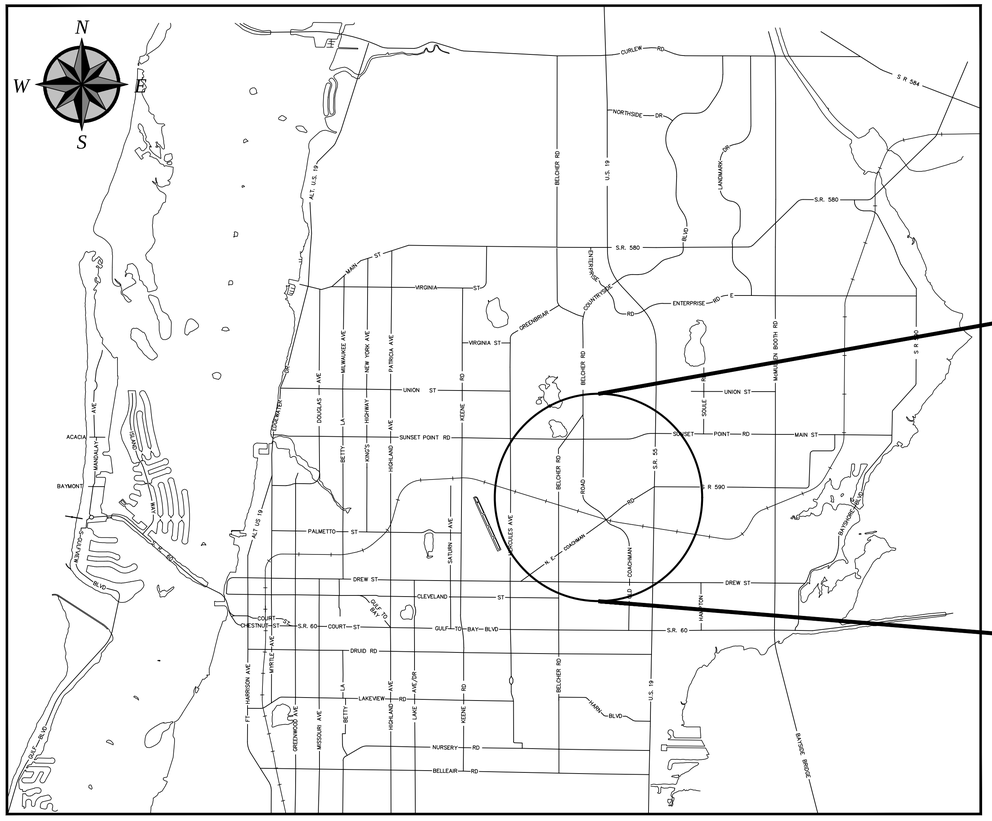
BRIGHT AND BEAUTIFUL • BAY TO BEACH

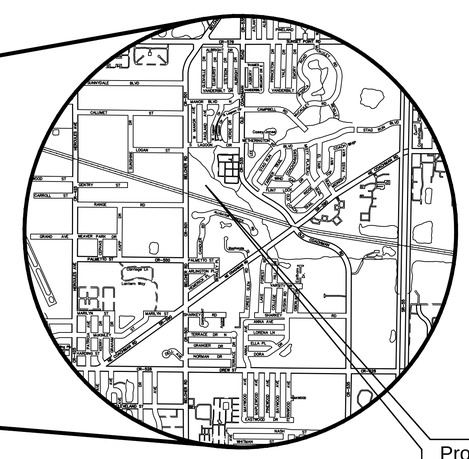
CITY OF CLEARWATER, FLORIDA

ESTABLISHED 1915

WILLIAM F. BAND LICENSE No 67838 STATE OF FLORIDA PROFESSIONAL ENGINEER

LONG CENTER NATATORIUM
STRUCTURAL FRAME REPAIRS





Project Location

CITY OFFICIALS

Frank Hibbard	Mayor
Mark Bunker	Councilmember
Kathleen Beckman	Councilmember
David Allbritton	Councilmember
Lina Teixeira	Councilmember
Jon Jennings	City Manager

Tara L. Kivett, P.E.
City Engineer

Approved For Construction _____

CITY ENGINEER Tara L. Kivett, P.E. #86611

Date Approved _____

FINAL DESIGN
RELEASED FOR BID

City Project No. 21-0026-PR
City Plan Set No. 2021017

1 GENERAL NOTES

1.1 ALL WORK IS TO BE PERFORMED IN A GOOD, WORKMANLIKE AND PROFESSIONAL MANNER.

1.2 ALL CONSTRUCTION SHALL BE IN STRICT COMPLIANCE w/ THE REQUIREMENTS OF THE FLORIDA STATE BUILDING CODE (FBC), 2020 EDITION, OR LOCAL BUILDING CODE REQUIREMENTS IF MORE STRINGENT.

1.3 THESE DRAWINGS DO NOT SHOW PROVISIONS FOR SAFETY DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THE REQUIRED BRACING, SHORING, AND SAFETY DEVICES THROUGHOUT THE CONSTRUCTION OF THIS PROJECT.

2 COORDINATION

2.1 STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION w/ & COORDINATED w/ EXISTING ARCHITECTURAL, CIVIL, ELECTRICAL, MECHANICAL AND PLUMBING DRAWINGS, INCLUDING VENDOR SUBMITTAL DRAWINGS AND OTHER CONTRACT DOCUMENTS.

2.2 ANY DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE SHOWN ON THESE DRAWINGS ARE TO BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER BEFORE WORK PROCEEDS, INCLUDING ORDERING AND FABRICATING MATERIALS.

2.3 INDEPENDENT TESTING / REVIEW OF MATERIALS SHALL BE PROVIDED AS DEFINED IN PROJECT SPECIFICATIONS IF APPLICABLE. IN GENERAL PROJECT INVOLVES THE FOLLOWING:
A. STRUCTURAL STEEL.
B. FIELD WELDING.

2.4 IF COORDINATION OF INFORMATION PRESENTED CONFLICTS w/ THE PROJECT SPECIFICATIONS, THE DRAWINGS WILL TAKE PRECEDENCE.

2.5 IN GENERAL CALL-OUTS ARE FOR NEW CONSTRUCTION U.N.O.. EXISTING CONSTRUCTION CALL-OUTS, ELEVATIONS AND DIMENSIONS OF EXISTING STRUCTURES ARE BASED ON EXISTING RECORD DRAWINGS PROVIDED TO McKIM & CREED. THE (*) SYMBOL ON INDIVIDUAL FACILITY "STRUCTURAL" DRAWINGS INDICATES EXISTING CONSTRUCTION CALL-OUTS, CONDITIONS, ELEVATIONS AND DIMENSIONS TO BE FIELD VERIFIED BY THE GENERAL CONTRACTOR U.N.O. PRIOR TO CONSTRUCTION, INCLUDING ORDERING AND FABRICATING MATERIALS. RECORD DRAWINGS PROVIDED BY THE CITY OF CLEARWATER UTILIZED INCLUDES:
A. "CENTER FOUNDATION, INC. FOR EDUCATION, TRAINING AND, RECREATION" BY MUDANO ASSOCIATES ARCHITECTS, INC. (DTD. MARCH 1989).

2.6 SPECIAL INSPECTIONS (IF APPLICABLE): STRUCTURAL STEEL WORK SHALL BE REVIEWED AS STATED IN CONJUNCTION w/ THEIR RESPECTIVE NOTES BELOW.

2.7 CONTRACTOR SHALL COORDINATE ALL DEMOLITION ACTIVITIES OF EXISTING CONSTRUCTION IN PLACE w/ THE OWNER. CONTRACTOR TO NOTE THE OWNER HAS THE RIGHT OF FIRST REFUSAL FOR ALL REMOVED AND / OR SCRAPPED MATERIALS AND EQUIPMENT.

3 FOUNDATIONS

NOT APPLICABLE.

4 REINFORCING STEEL

NOT APPLICABLE.

5 CONCRETE

NOT APPLICABLE.

6 GROUT

6.1 GROUT WHERE REQUIRED SHALL BE NON-SHRINK GROUT IN CONFORMANCE TO ASTM C1107.

6.2 GROUT SHALL BE NON-METALLIC AND NON-STAINING AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI.

7 MASONRY

NOT APPLICABLE.

8 STRUCTURAL STEEL

8.1 STEEL SHALL CONFORM TO "STANDARD SPECIFICATION FOR STRUCTURAL STEEL," ASTM A36 (Fy=36 ksi) FOR ANGLES, PLATES & CHANNELS. WIDE FLANGE SECTIONS SHALL CONFORM TO ASTM A992 (Fy=50 ksi). HOLLOW STEEL SECTIONS (HSS) SHALL CONFORM TO ASTM A500, GRADE B (Fy=46 ksi). STEEL PIPE SHALL CONFORM TO ASTM A53, GRADE B, (Fy=35 ksi).

8.2 STEEL WORK SHALL CONFORM TO "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL BUILDINGS", OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC., (2016 EDITION), INCLUDING ALL SUPPLEMENTS AND THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", (LATEST EDITION).

8.3 CONNECTION BOLTS SHALL BE 3/4 INCH DIAMETER CONFORMING TO "STANDARD SPECIFICATION FOR HIGH-STRENGTH BOLTS FOR STRUCTURAL STEEL JOINTS", ASTM F3125, GRADE A325, GROUP A CRITERIA. UNLESS NOTED OTHERWISE CONNECTIONS ARE BEARING TYPE WITH THREADS EXCLUDED FROM SHEAR PLANES.

8.4 WELDING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN WELDING SOCIETY AWS D1.1 "STRUCTURAL WELDING CODE". WELDING SHALL BE PERFORMED BY CERTIFIED PERSONNEL WHO HAVE BEEN PREVIOUSLY QUALIFIED BY TEST PRESCRIBED IN THE AWS "STRUCTURAL WELDING CODE". ELECTRODES SHALL CONFORM TO AWS 5.5, E7018 CRITERIA.

8.5 THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY BRACING, SHORING, AND GUYING OF STEEL FRAMING AGAINST WIND, CONSTRUCTION LOADS, AND OTHER TEMPORARY FORCES UNTIL SUCH PROTECTION IS NO LONGER REQUIRED FOR THE SAFE SUPPORT OF THE FRAMING.

8.6 ALL COPES, BLOCKS, CUTS, CUT-OFFS AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, AND NOTCH-FREE TO A RADIUS OF AT LEAST 1/2 INCH. THE FILLET AND ITS CONTIGUOUS CUTS SHALL MEET WITHOUT OFFSET OR CUTTING PAST THE POINT OF TANGENCY.

8.7 ANCHOR BOLTS SHALL BE ASTM F1554 OR ASTM A36 & SHALL BE EITHER HEADED w/ NUTS TACK WELDED TO BOLTS OR NON-HEADED w/ HOOKS AS REQUIRED BY THE DRAWINGS. PROVIDE (2) NUTS AND WASHERS WITH EACH ANCHOR BOLT AT COLUMNS UNLESS NOTED OTHERWISE. ANCHOR BOLTS FOR EQUIPMENT & OTHER ASSEMBLIES MAY BE POST APPLIED ANCHOR ASSEMBLIES AS INDICATED ON THE DRAWINGS.

8.8 OVERSIZED AND SLOTTED HOLES SHALL NOT BE USED FOR BOLTED CONNECTIONS ON THIS PROJECT EXCEPT AT LOCATIONS NOTED ON DRAWINGS.

8.9 SPLICING OF STRUCTURAL STEEL MEMBERS IS PROHIBITED WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER, AS TO LOCATION AND TYPE OF SPLICE. ANY MEMBER HAVING A SPLICE NOT SHOWN AND DETAILED ON THE SHOP DRAWINGS WILL BE REPLACED.

8.10 PRE-GROUTING BASE PLATES IS NOT PERMITTED.

8.11 ALL HOLES IN STRUCTURAL STEEL ARE TO BE PUNCHED OR DRILLED. FLAME CUTTING OF STEEL IS STRICTLY PROHIBITED.

8.12 ALL DESIGN, DETAILING, FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION.

8.14 FABRICATOR / CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR OWNER / ENGINEER APPROVAL PRIOR TO FABRICATION. ALL SHOP DRAWINGS MAY BE EXPEDITED IF THE FABRICATOR ADHERES CLOSELY TO THE DETAILS, NOTES, AND INSTRUCTIONS, SHOWN ON THE DRAWINGS.

8.15 ALL GALVANIZED MATERIALS THAT ARE FIELD CUT, FIELD WELDED OR DAMAGED IN SURFACE FINISH SHALL BE CLEANED AND RE-COATED w/ A 98% ZINC RICH OXIDE AND IN CONFORMANCE w/ THE PROJECT SPECIFICATIONS.

8.16 STRUCTURAL STEEL FRAMING ERECTION TO BE REVIEWED BY THE THE OWNER'S CONSTRUCTION REPRESENTATIVE THROUGHOUT STEEL CONSTRUCTION OF THE PROJECT.

9 ALUMINUM

NOT APPLICABLE.

10 PRECAST CONCRETE

NOT APPLICABLE.

11 PRE-ENGR. TIMBER TRUSS

NOT APPLICABLE.

12 PRE-ENGR. METAL BLDGS.

NOT APPLICABLE.

13 MISC. BUILDING MATERIALS

13.1 ALL MISCELLANEOUS MATERIALS ARE TO BE DELIVERED TO SITE & STAGED ON SITE PRIOR TO INSTALLATION. STORE ON SITE AS REQUIRED BY THE MATERIAL MANUFACTURER TO AVOID DAMAGE PRIOR TO INSTALLATION.

13.2 CAULK & SEALANT MATERIAL SHALL BE MASTERSEAL "NP 1" ONE COMPONENT, MOISTURE CURING HIGH PERFORMANCE POLY-URETHANE SEALANT, OR AN APPROVED EQUAL.

13.3 FINISH COATING SYSTEM SHALL UTILIZE PRODUCTS MANUFACTURED BY PPG INDUSTRIES & TO INCLUDE THE FOLLOWING:
a.) PRIMER COAT = SPEEDHIDE 6-208 SERIES 2.0 MIL DFT THK.
b.) INTERMEDIATE COAT = 7-LINE 7-282 SERIES INDUSTRIAL GLASS OIL ALKYD 3.0 MIL DFT. THK. (MIN.).
c.) TOP COAT = 7-LINE 7-282 SERIES INDUSTRIAL GLASS OIL ALKYD 3.0 MIL DFT. THK. (MIN.).

14 ABBREVIATIONS

14.1 THE FOLLOWING LIST OF ABBREVIATIONS IS NOT INTENDED TO REPRESENT ALL THOSE USED ON THE DRAWINGS, BUT TO SUPPLEMENT THE MORE COMMON ABBREVIATIONS USED.

ADD'L	=	ADDITIONAL
AL	=	ALUMINUM
ALT.	=	ALTERNATE
BLDG.	=	BUILDING
BLK.	=	BLOCK
BM.	=	BEAM
B.O.	=	BOTTOM OF
BRG.	=	BEARING
C.I.P.	=	CAST-IN-PLACE
CLR.	=	CLEAR
CMU	=	CONC. MAS. UNIT
C.O.	=	CLEAN OUT
COL.	=	COLUMN
CONC.	=	CONCRETE
CONN.	=	CONNECTION
CONST.	=	CONSTRUCTION
CONT.	=	CONTINUOUS
COORD.	=	COORDINATE
CTR.	=	CENTER
CTR'D.	=	CENTERED
DBL.	=	DOUBLE
DIR.	=	DIRECTION
DWG.	=	DRAWING
DWG.'s.	=	DRAWINGS
EA.	=	EACH
EL	=	ELEVATION
E.O.	=	EDGE OF
EQ.	=	EQUAL
EQUIP.	=	EQUIPMENT
EXIST.	=	EXISTING
EXP.	=	EXPANSION
FLG.	=	FLANGE
FDN.	=	FOUNDATION
F.S.	=	FAR SIDE
FT.	=	FEET
FTG.	=	FOOTING
GA.	=	GAGE
GALV.	=	GALVANIZED
GALV'D	=	GALVANIZED
HORZ.	=	HORIZONTAL
H.P.	=	HIGH POINT
HRS.	=	HOURS
I/F	=	INSIDE FACE
INFO.	=	INFORMATION
INTR.	=	INTERIOR
JST.	=	JOIST
JT.	=	JOINT
KB	=	KNEE BRACE
LCS	=	LIQUID CONTAINMENT STRUCTURES
LLH	=	LONG LEG HORIZONTAL
LLV	=	LONG LEG VERTICAL
L.P.	=	LOW POINT
LSL	=	LONG SLOTTED
MAS.	=	MASONRY
MAT'L.	=	MATERIAL
MFG.	=	MANUFACTURER
MIN.	=	MINIMUM
MTL.	=	METAL
N/A	=	NOT APPLICABLE
NA	=	NOT APPLICABLE
NOM.	=	NOMINAL
N.S.	=	NEAR SIDE
N.T.S.	=	NOT TO SCALE
O.C.	=	ON CENTER
O/F	=	OUTSIDE FACE
O/H	=	OVERHANG
O/O	=	OUT TO OUT
OPNG.	=	OPENING
OPP.	=	OPPOSITE
ORIENT.	=	ORIENTATION
PLCS.	=	PLACES
P.P.	=	PUMP PAD
RAD.	=	RADIUS
REF.	=	REFERENCE
REINF.	=	REINFORCING
REQ'D.	=	REQUIRED
RET.	=	RETAINING
ROT.	=	ROTATE
SIM.	=	SIMILAR
SPA.	=	SPACED
SPECS.	=	SPECIFICATIONS
S.S.	=	STAINLESS STEEL
SSL	=	SHORT SLOTTED
STD.	=	STANDARD
STL.	=	STEEL
T&B	=	TOP & BOTTOM
T/D	=	TURN DOWN
THK.	=	THICK
THK'D	=	THICKENED
T.O.	=	TOP OF
T.O.S	=	TOP OF STEEL
TYP.	=	TYPICAL
U.N.O.	=	UNLESS NOTED OTHERWISE
XB	=	CROSS OR "X"-BRACE
VERT.	=	VERTICAL
W.P.	=	WORK POINT

15 DESIGN LOADS

DESIGN LOADS BASIS OF DESIGN:
FLORIDA BUILDING CODE (FBC) - EDITION
MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES - ASCE 7-88

EQUIP. LOAD: N/A
LIVE LOAD: N/A
ROOF LOAD: 20 PSF
SNOW LOAD: N/A
WIND LOAD: 110 mi/hr, EXPOSURE C, OCCUPANCY / RISK CATEGORY III

CALCULATED WIND BASE SHEARS:
Vx = N/A & Vy = N/A

COMPONENTS & CLADDING WIND PRESSURES:
ZONE 1, ZONE 2 & ZONE 3 ROOF PRESSURES = N/A
ZONE 4 & ZONE 5 WALL PRESSURES = N/A

SEISMIC: N/A

SOIL BEARING: FIELD TEST PER PROJECT GEOTECH REPORT = N/A
REF. "FOUNDATIONS" NOTE 3.1 DWG. S0.00 ... N/A

16 DESIGN CRITERIA

CONCRETE 28 DAY COMPRESSIVE STRENGTH:	
SLABS-ON-GRADE & NON LCS SLABS	f'c = 4,000 PSI ... N/A
PIPE ENCASEMENTS:	f'c = 3,000 PSI ... N/A
SLABS & WALLS OF LCS:	f'c = 4,500 PSI ... N/A
BEAMS & COLUMNS OF LCS:	f'c = 4,500 PSI ... N/A
NON-LCS FOOTINGS & PIERS:	f'c = 4,000 PSI ... N/A
BELOW GRADE & RETAINING WALLS:	f'c = 4,000 PSI ... N/A
SIDEWALK, DRIVEWAY, CURB & GUTTER:	f'c = 3,000 PSI ... N/A
REINFORCING STEEL:	ASTM A615, GRADE 60 ... N/A
WELDED WIRE FABRIC:	ASTM A1064 ... N/A
STRUCTURAL STEEL:	REF. STRUCTURAL NOTE 8.1
ALUMINUM:	REF. STRUCTURAL NOTE 9.2 ... N/A
BOLTS SHALL BE 3/4"Ø ASTM A325 OR TYPE 316 S.S.:	REF. STRUCTURAL NOTES 8.3 & 9.2.d ... N/A
ANCHOR BOLTS SHALL BE 3/4"Ø ASTM F-1554 OR ASTM A36 (STEEL); TYPE 316 S.S. (ALUMINUM):	
STEEL ELECTRODES SHALL CONFORM TO:	AWS 5.5 E7018
ALUMINUM WELD FILLERS ALLOYS SHALL CONFORM TO:	AWS AS.10 ... N/A
SOIL BEARING CAPACITY:	REF. "DESIGN LOADS" TABLE

17 LEGEND

ENLARGED PLAN AREA, DETAIL	=		
CONC. MASONRY BLOCK	=		(EXISTING)
BRICK VENEER	=		(EXISTING)
CONC. WALL, SLAB, ETC.	=		(EXISTING)
GROUT	=		(EXISTING)
GRATING	=		(EXISTING)
DETAIL OR SECTION NO./SHEET NO. REFERENCE	=	X-SY.YY	X-SY.YY
PROJECT NORTH	=	NORTH	
ELEVATION DATUM	=		
ELEVATION NO./SHEET NO. REFERENCE	=	X-SY.YY	
ELEVATIONS X'-X" (Y.YY')	=	X'-X" = DISTANCE TO / FROM FACILITY REFERENCE EL 0'-0" Y.YY' = EQUIVALENT SITE EL VERTICAL DATUM	
STEP IN FOOTING ELEVATION	=	$	
STL. FRAMING COL./BM. MOMENT CONNECTION	=	▶	

REV.NO.	DESCRIPTION	DATE
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LONG CENTER NATATORIUM
STRUCTURAL FRAME REPAIRS

STRUCTURAL

GENERAL NOTES, DESIGN LOADS, DESIGN CRITERIA & LEGEND

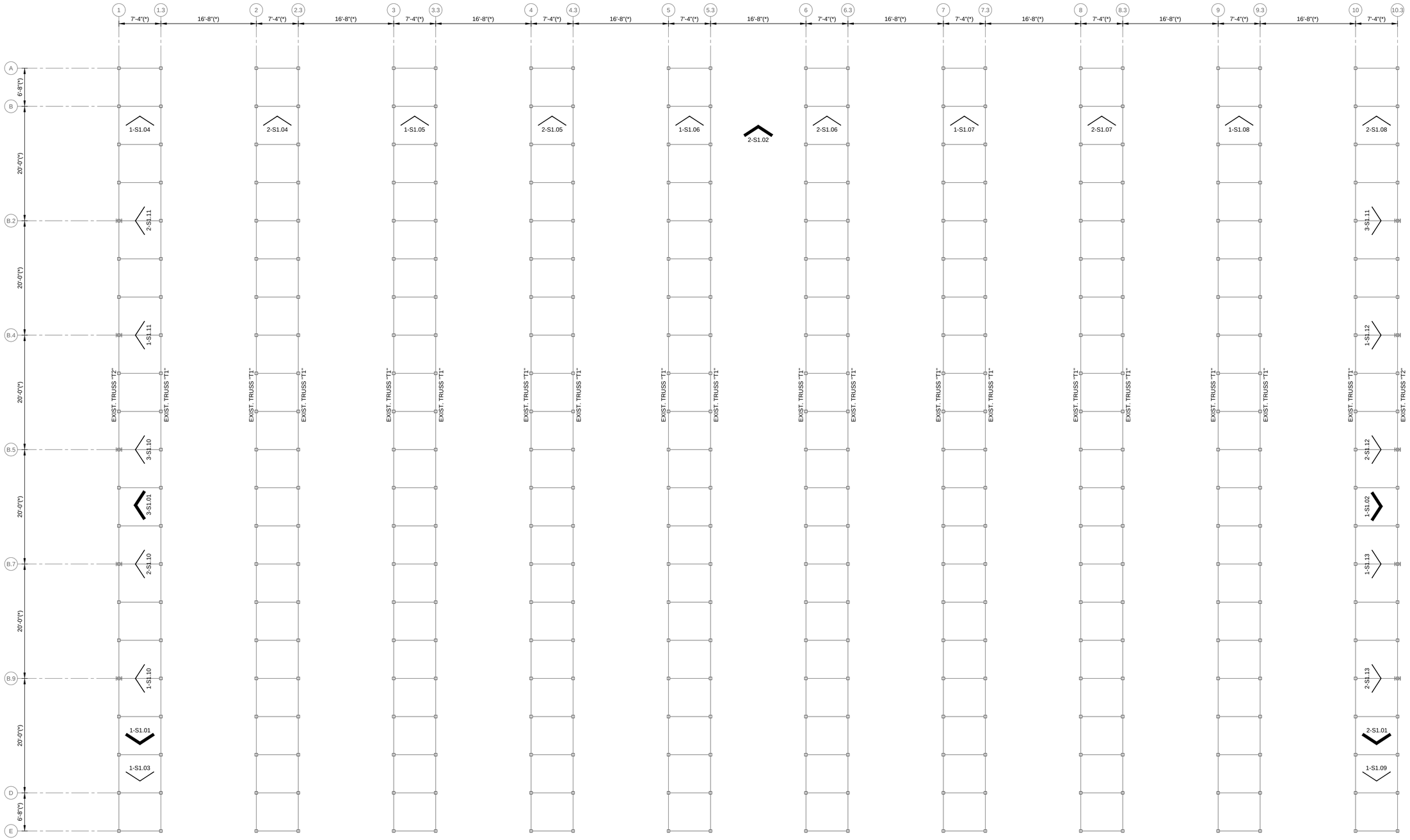
PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: NA
VERTICAL: NA

S0.00
DRAWING NUMBER

D
REVISION

STATUS: **FINAL DESIGN SUBMITTAL RELEASED FOR BID**



FRAMING PLAN NOTES:

1. TRUE NORTH VARIES FROM PLAN NORTH INDICATED. COORDINATE w/ CIVIL & SITE RECORD DWG.'s AS REQUIRED FOR THE DIRECTION OF TRUE NORTH
2. REFERENCE ELEVATION FOR BUILDING "A" OF THE LONG CENTER FACILITY IS THE POOL DECK SLAB T.O. CONC. "H.P." EL 0'-0" = EL 43'-0" (43.00'). CONTRACTOR SHALL VERIFY THE CORRESPONDING N.A.V.D. INDICATED AS REQUIRED. REFERENCE CIVIL AND / OR SITE RECORD DRAWINGS FOR ADDITIONAL INFORMATION.
3. GRADE ELEVATION AROUND THIS STRUCTURE IS 42.50'(±)[*]. REFERENCE CIVIL AND / OR SITE RECORD DRAWINGS FOR ADDITIONAL INFORMATION.

CTD. ...

4. EXISTING RECORD DRAWING's REVIEWED INDICATED & SITE VISITS CONFIRMED THE EXISTING TRUSS ASSEMBLIES CONSTRUCTED OF HSS 6x6 STRUCTURAL STEEL & NOTE THE FOLLOWING:
   a.) DWG.'s INDICATED HSS's ARE EITHER $\frac{3}{8}$", $\frac{5}{16}$" OR $\frac{1}{4}$" THICK SECTIONS.
   b.) BASED UPON YEAR CONSTRUCTED IT IS ESTIMATED STEEL SECTIONS IN CONFORMANCE w/ ASTM A500.
5. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

NORTH
(PLAN)
[REF. NOTE 1]

1 - PLAN - EXIST. BUILDING "A" ROOF & EXTERIOR WALL FRAMING LAYOUT

SCALE: 1/8" = 1'-0"

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STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST BLDG. A ROOF & EXTERIOR WALL FRAMING LAYOUT

PROJ. START DATE:	2021.NOV.
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.00
DRAWING NUMBER

D
REVISION

STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

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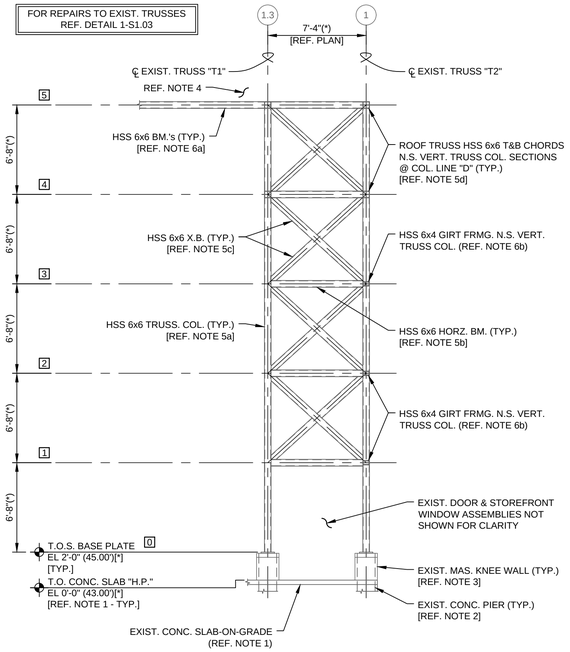
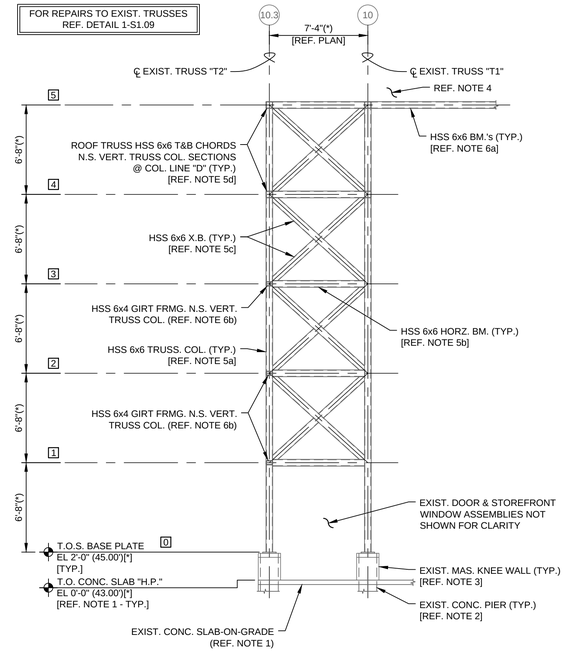


1 - ELEVATION - TRUSS "T1" & "T2" SUPPT. FRMG. @ COL. LINE "D"

SCALE: 3/16" = 1'-0"

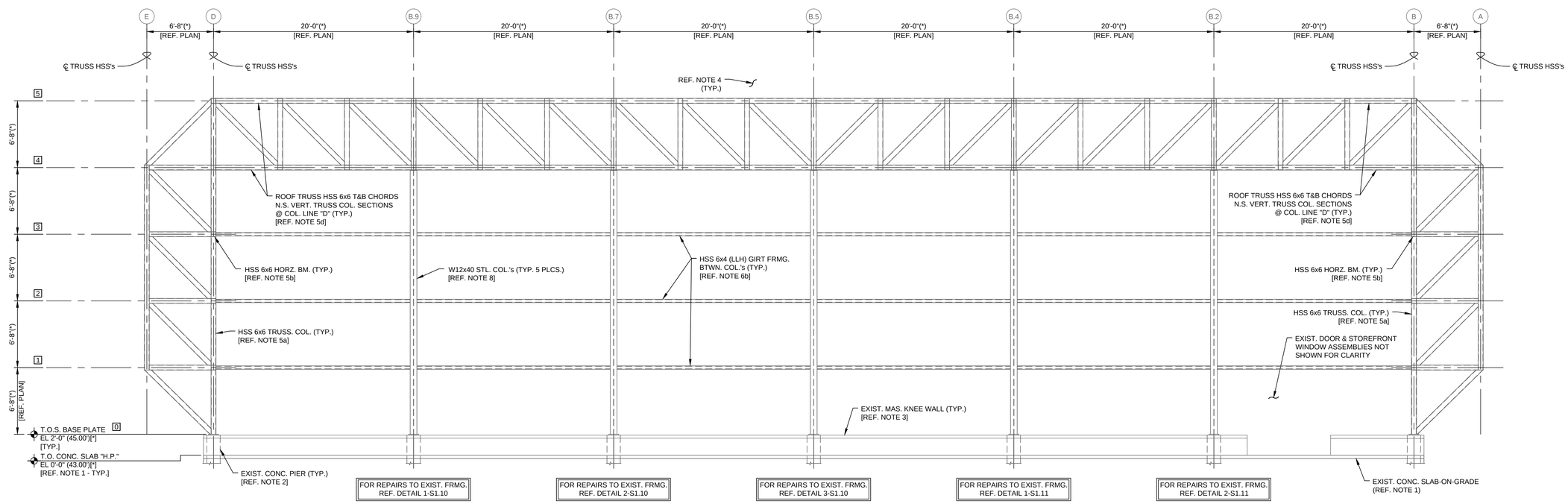


2 - ELEVATION - TRUSS "T1" & "T2" SUPPT. FRMG. @ COL. LINE "D"

SCALE: 3/16" = 1'-0"

NOTES:

1. REGARDING THE EXISTING SLAB-ON-GRADE FLOOR CONSTRUCTION RECORD DRAWING's REVIEWED INDICATED THE FOLLOWING:
   a.) SLAB CONSTRUCTED 4" THK. (MIN.).
   b.) SLAB REINFORCED w/ 6x6 - W1.4 x W1.4 WELDED WIRE FABRIC @ MID-DEPTH OF THE SLAB.
2. RECORD DRAWINGS REVIEWED INDICATED EXISTING C.I.P. REINFORCED CONCRETE PIER ASSEMBLIES TRANSFER LOADS FROM THE THE EXISTING VERTICAL TRUSS COLUMNS TO EXISTING SHALLOW FOUNDATION C.I.P. REINFORCED CONCRETE FOOTINGS. REGARDING THE EXISTING PIER ASSEMBLIES CONSTRUCTION NOTE THE FOLLOWING:
   a.) PIER DIM.'s = 1'-4" SQUARE.
   b.) PIER REINF. = (8) #7 VERT. BARS INSTALLED (3) EA. FACE & #3 TIES SPA. @ 1'-0" O.C..
3. REGARDING THE EXISTING MASONRY KNEE WALL AROUND THE NORTH, SOUTH & WEST SIDE EXTERIOR WALLS, RECORD DRAWINGS REVIEWED INDICATED THE FOLLOWING:
   a.) EXTERIOR SIDE FINISHES = 4" THK. SPLIT-FACE TYPE CMU.
   b.) INTERIOR SIDE FINISHES = 4" THK. SMOOTH FACED TYPE CMU.
   c.) TOP FINISHES = 4" THK. SOLID CMU COPING BLOCK.
   d.) WALL THK. = 1'-8"(*) THK. ASSEMBLY CONSISTING OF (1) 12" THK. INTERIOR COURSE BLOCK, (1) INTERIOR COURSE BLOCK & (1) EXTERIOR COURSE BLOCK AS PREVIOUSLY NOTED.
   e.) MASONRY THICKNESS DIM.'s INDICATED ARE NOMINAL.
4. EXISTING ROOF DECK & ROOFING ASSEMBLIES NOT SHOWN FOR CLARITY. FIELD COORDINATE EXISTING MATERIALS AND DIMENSIONAL INFORMATION AS REQUIRED.
5. REGARDING THE EXISTING STRUCTURAL STEEL TRUSS ASSEMBLIES RECORD DWG.'s REVIEWED INDICATED THE FOLLOWING:
   a.) VERTICAL COLUMN SECTIONS @ COL. LINES "B" & "D" = HSS 6x6x$\frac{3}{8}$.
   b.) HORIZONTAL BEAM SECTIONS BTWN. TRUSSES = HSS 6x6x$\frac{1}{4}$.
   c.) DIAGONAL X-BRACE SECTIONS = HSS 6x6x$\frac{1}{2}$.
   d.) ROOF TRUSS CHORD SECTIONS = HSS 6x6x$\frac{5}{16}$.
6. REGARDING THE EXISTING STRUCTURAL STEEL SECONDARY FRAMING SPANNING BETWEEN THE TRUSSES AND THE BUILDING COL.'s AT THE EAST AND WEST WALLS, RECORD DRAWINGS REVIEWED INDICATED THE FOLLOWING:
   a.) HSS BEAM SECTIONS BETWEEN THE TRUSS PAIRINGS = HSS 6x6x$\frac{5}{16}$.
   b.) HSS BEAM SECTIONS BETWEEN THE TRUSSES / COLUMNS = HSS 6x4x$\frac{1}{4}$ (LLH).
7. " $\boxed{X}$ " SYMBOL ON STEEL FRAMING ELEVATIONS INDICATES THE HEIGHT LEVEL IN THE REPAIR MARK #'s TO BE COORDINATED w/ THE REPAIR PROCEDURES ON DWG.'s S-1.03 TO S1.13.
8. REGARDING THE STRUCTURAL STEEL W12 COL. ASSEMBLIES RECORD DWG.'s DID NOT APPEAR TO INDICATE A SEPARATE STEEL SECTION CONNECTING TO THE O/F OF THE EXTR. FLANGE OF THE W12. SITE REVIEWS APPEARED TO INDICATE THIS SECTION MAY BE AN HSS. FIELD COORDINATE AS REQUIRED FOR REPAIRING STEEL SECTIONS AT THESE COLUMN LOCATIONS.
9. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.



3 - ELEVATION - TRUSS "T2" SUPPT. FRMG. @ COL. LINE "1"

SCALE: 3/16" = 1'-0"

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STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A ROOF & EXTR. WALL FRMG. ELEVATIONS (SHT. 1 OF 2)

PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.01
DRAWING NUMBER

D
REVISION

STATUS: **FINAL DESIGN SUBMITTAL RELEASED FOR BID**

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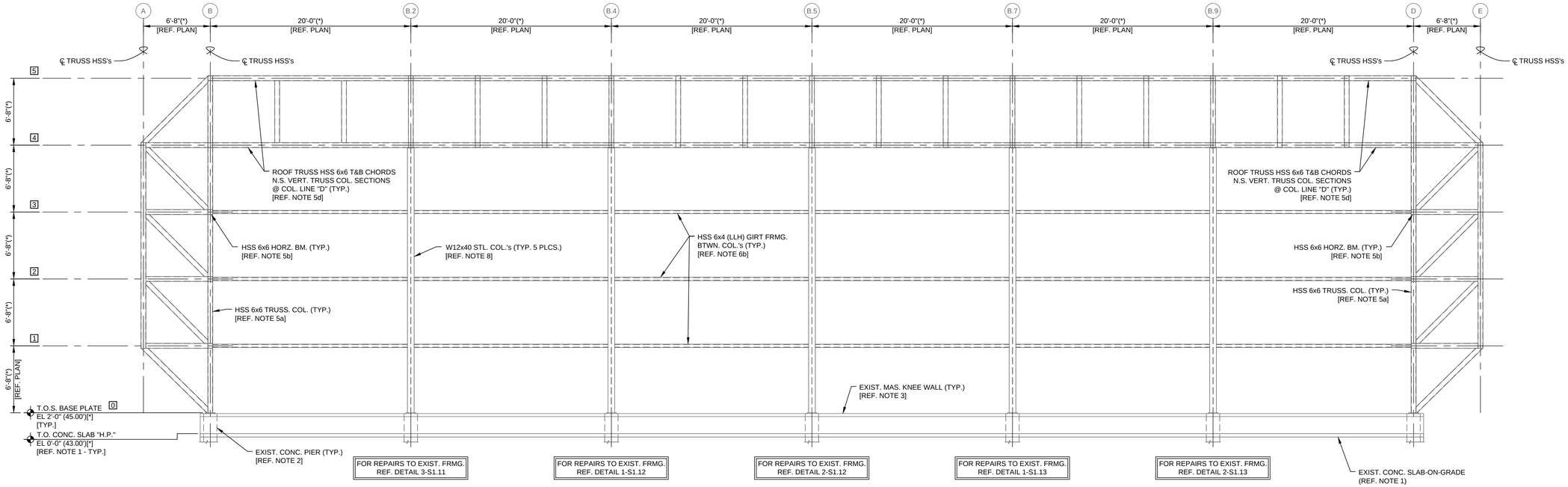
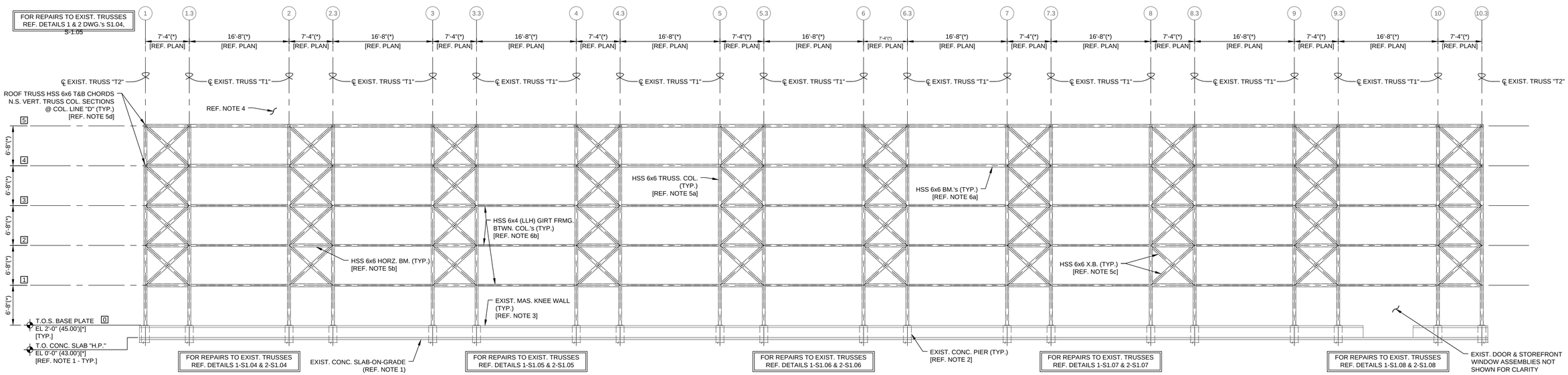


1 - ELEVATION - TRUSS "T2" SUPPT. FRMG. @ COL. LINE "10.3"

SCALE: 3/16" = 1'-0"



2 - ELEVATION - TRUSS "T1" & TRUSS "T2" SUPPT. FRMG. @ COL. LINE "B"

SCALE: 1/8" = 1'-0"

NOTES:

1. FOR ELEVATION CALL-OUTS REFERENCING NOTES COORDINATE w/ THE DRAWING NOTES ON DRAWING S-1.01 FOR INFORMATION.
2. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

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LONG CENTER NATATORIUM STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A ROOF & EXTR. WALL FRMG. ELEVATIONS (SHT. 2 OF 2)

PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.02
DRAWING NUMBER
D
REVISION

STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

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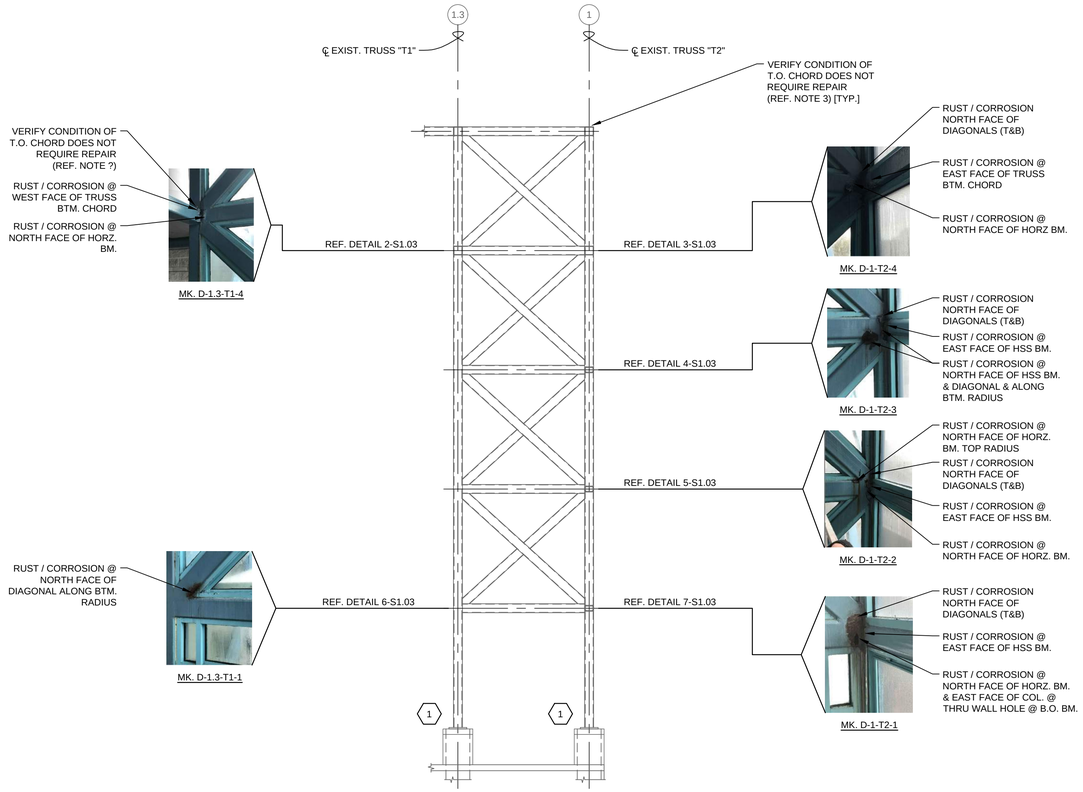
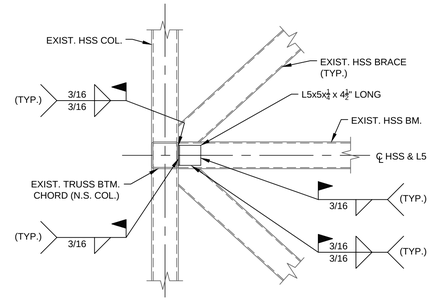


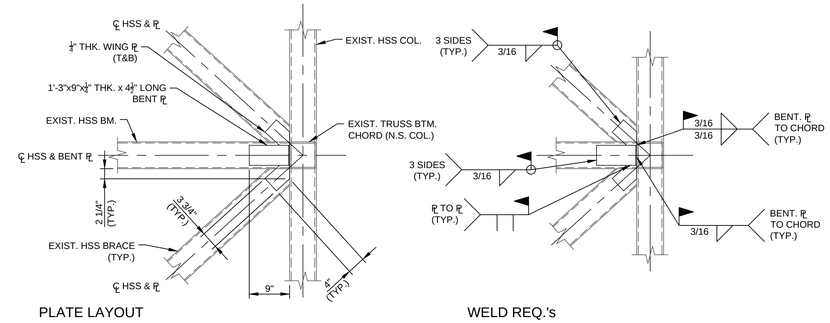
1 - DETAIL - TRUSS "T1" & "T2" @ COL. LINE "D"

SCALE: 1/4" = 1'-0"



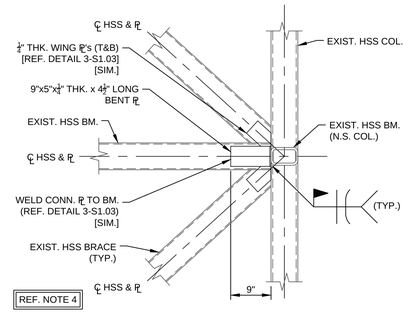
2 - DETAIL - D-1.3-T1-4 REPAIR

SCALE: 3/4" = 1'-0"



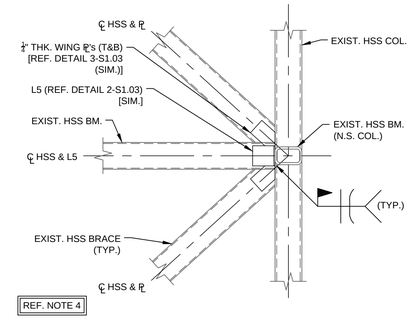
3 - DETAIL - D-1-T2-4 REPAIR

SCALE: 3/4" = 1'-0"



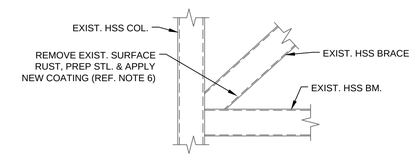
4 - DETAIL - D-1-T2-3 REPAIR

SCALE: 3/4" = 1'-0"



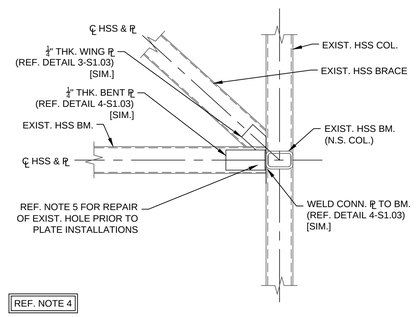
5 - DETAIL - D-1-T2-2 REPAIR

SCALE: 3/4" = 1'-0"



6 - DETAIL - D-1.3-T1-1 REPAIR

SCALE: 3/4" = 1'-0"



7 - DETAIL - D-1-T2-1 REPAIR

SCALE: 3/4" = 1'-0"

TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE:

TRUSS CONNECTION LOCATION MK. # = D-1.3-T1-4

D	= EAST / WEST ORIENTED COLUMN LINE DIRECTION ON PLAN 1-S1.00.
1.3	= NORTH / SOUTH ORIENTED COLUMN LINE DIRECTION ON PLAN 1-S1.00.
T1	= EXISTING TRUSS TYPE T1 OR T2 AS NOTED ON PLAN 1-S1.00 & TRUSS DETAIL ELEVATIONS.
4	= ELEVATION ABOVE THE EXISTING SLAB-ON-GRADE AS INDICATED w/ "X" SYMBOL ON DWG.'s S1.01 & S1.02.
S / N	= SOUTH / NORTH SIDE OF THE EXISTING COLUMN.

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE U.N.O.. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" THIS DWG. FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING TOP CHORDS EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IN GENERAL REPAIR THE EXISTING HOLE BY PREPARING THE HOLE EDGES TO NON-CORRODED STEEL, FILLING THE INTERNAL VOLUME OF THE HSS w/ GROUT & INSTALLING STEEL PLATE REPAIRS. NOTE THE FOLLOWING:
   a.) REMOVE ALL LOOSE SURFACE RUST & CORROSION FROM THE HSS BEAM.
   b.) ENLARGE EXISTING HOLE BY GRINDING EXIST. HSS WALL BACK TO FULL THK. OF THE HSS WALL.
   c.) CUT CARDBOARD GROUT DAM SECTIONS TO THE INTERIOR PROFILE OF THE HSS BEAMS & COLUMN RESPECTIVELY. USE THE CARDBOARD GROUT DAMS w/ EXPANSION FOAM TO SEAL THE INTERNAL VOLUME OF THE BEAMS & COLUMN TO BE GROUTED. POSITION DAMS TO 4" (MIN.) FROM THE EDGE OF THE HOLE. FILL THE INTERNAL VOLUME BETWEEN THE DAMS w/ NON-SHRINK GROUT, CURE & FINISH SMOOTH TO THE O/F OF THE HSS STEEL WALLS.
   d.) INSTALL THE PLATE REPAIRS INDICATED.

NOTES CTD. ...

6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. "X" SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
8. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.03

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	ANGLE SECTION	L5x5x½" x 4½"	2	
02	BENT PLATE	1'-3"x9"x¾" x 4½"	1	
03	BENT PLATE	0'-9"x5"x¾" x 4½"	2	
04	WING PLATE	0'-4"x0'-3¾"x¾"	7	
05	FILLET WELD	3/16" EFF. THROAT	225"	
06	BUTT WELD	COMPLETE PEN.	20"	
07	FLARE BEVEL WELD	PARTIAL PEN.	30"	

REV.NO.	DESCRIPTION	DATE
D	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
C	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
B	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022
A	90% DESIGN - NOT FOR CONSTRUCTION	02 MAR 2022

REVISIONS

WILLIAM F. BAND, P.E.
No. 67838

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Clearwater, Florida 33756-3331
Phone: (727) 442-7196, Fax: (727) 461-3827

CA Lic. No. 29588
www.mckimcreed.com

CLEARWATER
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LONG CENTER NATATORIUM STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 1 OF 11)

PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

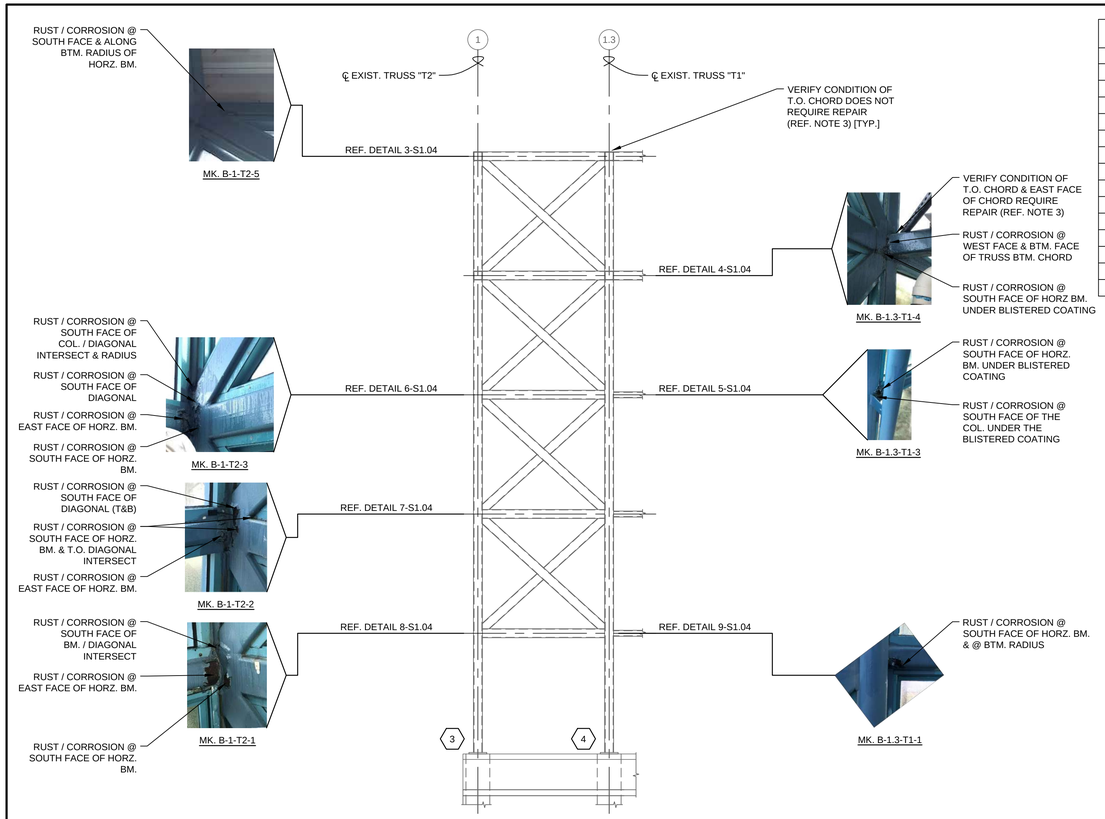
S1.03
DRAWING NUMBER
D
REVISION

STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

I:\00992\0261\ENG\80-DRAWINGS\STRUCTURAL\S103-SD401-09920261.DWG 05/23/2022 17:58:14 BILL BAND

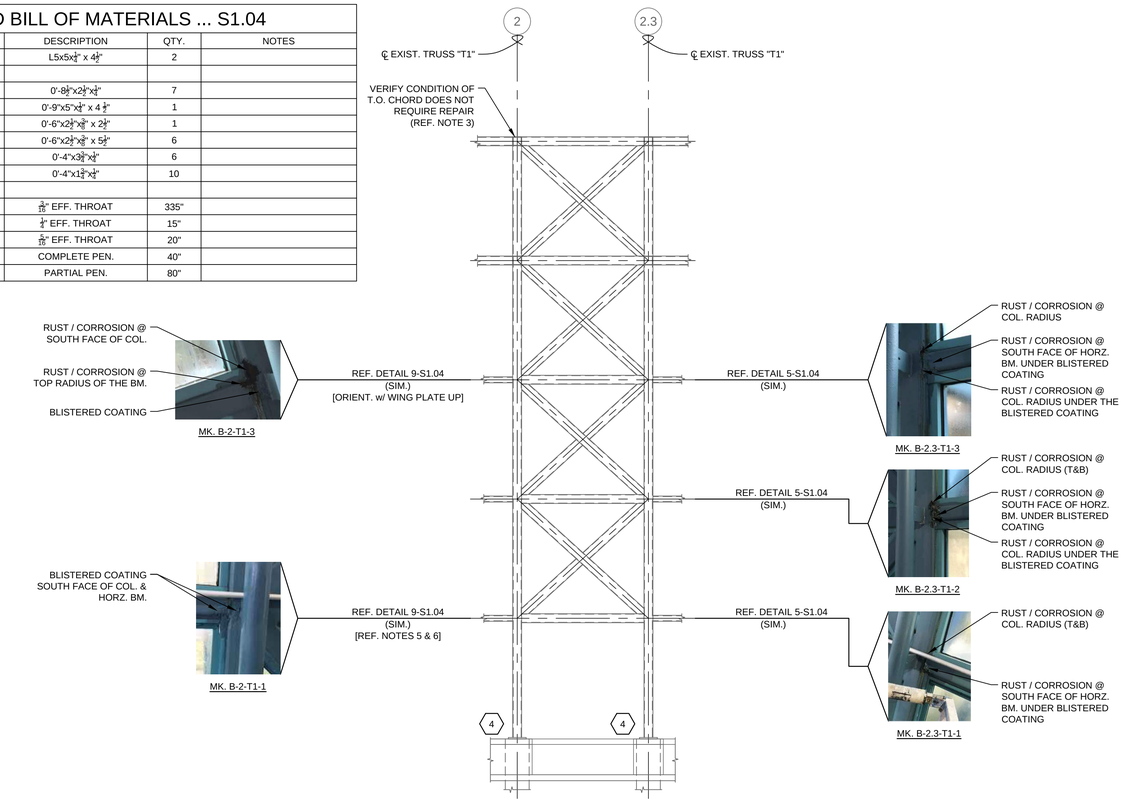
ESTIMATED BILL OF MATERIALS ... S1.04

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	ANGLE SECTION	L5x5x$\frac{3}{8}$" x 4$\frac{1}{2}$"	2	
02	PLATE	0'-8$\frac{1}{2}$"x2$\frac{1}{4}$"x$\frac{1}{4}$"	7	
03	BENT PLATE	0'-9"x5"x$\frac{1}{4}$" x 4 $\frac{1}{2}$"	1	
04	BENT PLATE	0'-6"x2$\frac{1}{2}$"x$\frac{3}{8}$" x 2$\frac{1}{2}$"	1	
05	BENT PLATE	0'-6"x2$\frac{1}{2}$"x$\frac{3}{8}$" x 5$\frac{1}{2}$"	6	
06	WING PLATE	0'-4"x3$\frac{3}{4}$"x$\frac{1}{4}$"	6	
07	WING PLATE	0'-4"x1$\frac{3}{4}$"x$\frac{1}{4}$"	10	
08	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	335"	
09	FILLET WELD	$\frac{1}{4}$" EFF. THROAT	15"	
10	FILLET WELD	$\frac{5}{16}$" EFF. THROAT	20"	
11	BUTT WELD	COMPLETE PEN.	40"	
12	FLARE BEVEL WELD	PARTIAL PEN.	80"	



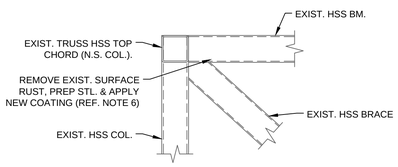
1 - DETAIL - TRUSS "T1" & "T2" @ COL. LINE "B"

SCALE: 1/4" = 1'-0"



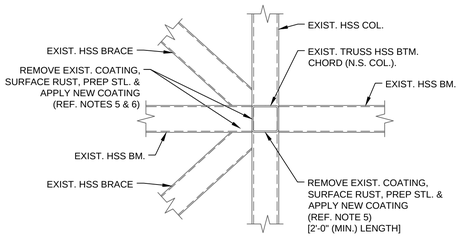
2 - DETAIL - TRUSS "T1" @ COL. LINE "B"

SCALE: 1/4" = 1'-0"



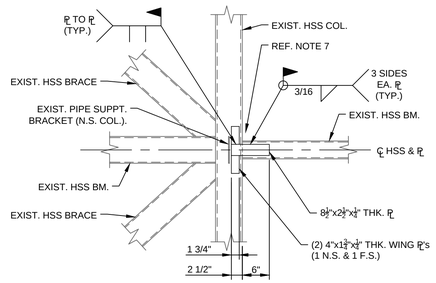
3 - DETAIL - B-1-T2-5 REPAIR

SCALE: 3/4" = 1'-0"



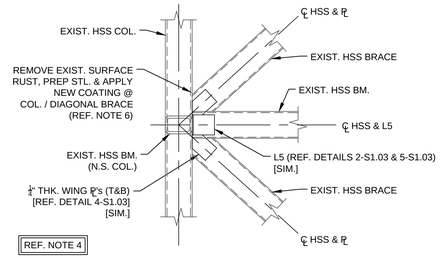
4 - DETAIL - B-1.3-T1-4 REPAIR

SCALE: 3/4" = 1'-0"



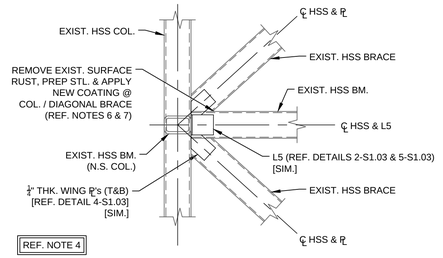
5 - DETAIL - B-1.3-T1-3 REPAIR

SCALE: 3/4" = 1'-0"



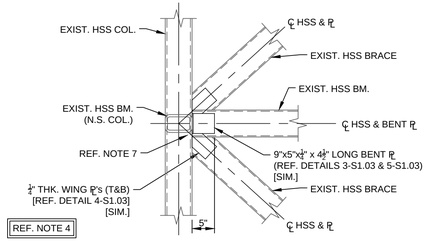
6 - DETAIL - B-1-T2-3 REPAIR

SCALE: 3/4" = 1'-0"



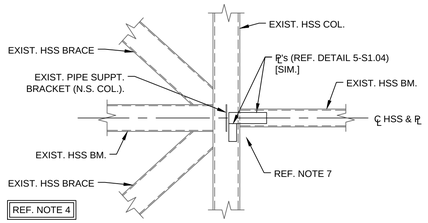
7 - DETAIL - B-1-T2-2 REPAIR

SCALE: 3/4" = 1'-0"



8 - DETAIL - B-1-T2-1 REPAIR

SCALE: 3/4" = 1'-0"



9 - DETAIL - B-1.3-T1-1 REPAIR

SCALE: 3/4" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE U.N.O.. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.03 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING TOP CHORDS EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. REFERENCE DWG. S1.09 FOR "ESTIMATED BILL OF MATERIALS" TABLE.
9. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
10. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

REV.NO.	DESCRIPTION	DATE
D	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
C	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
B	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022
A	90% DESIGN - NOT FOR CONSTRUCTION	02 MAR 2022

REVISIONS

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LONG CENTER NATATORIUM STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 2 OF 11)

PROJ. START DATE:	2021.NOV.
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

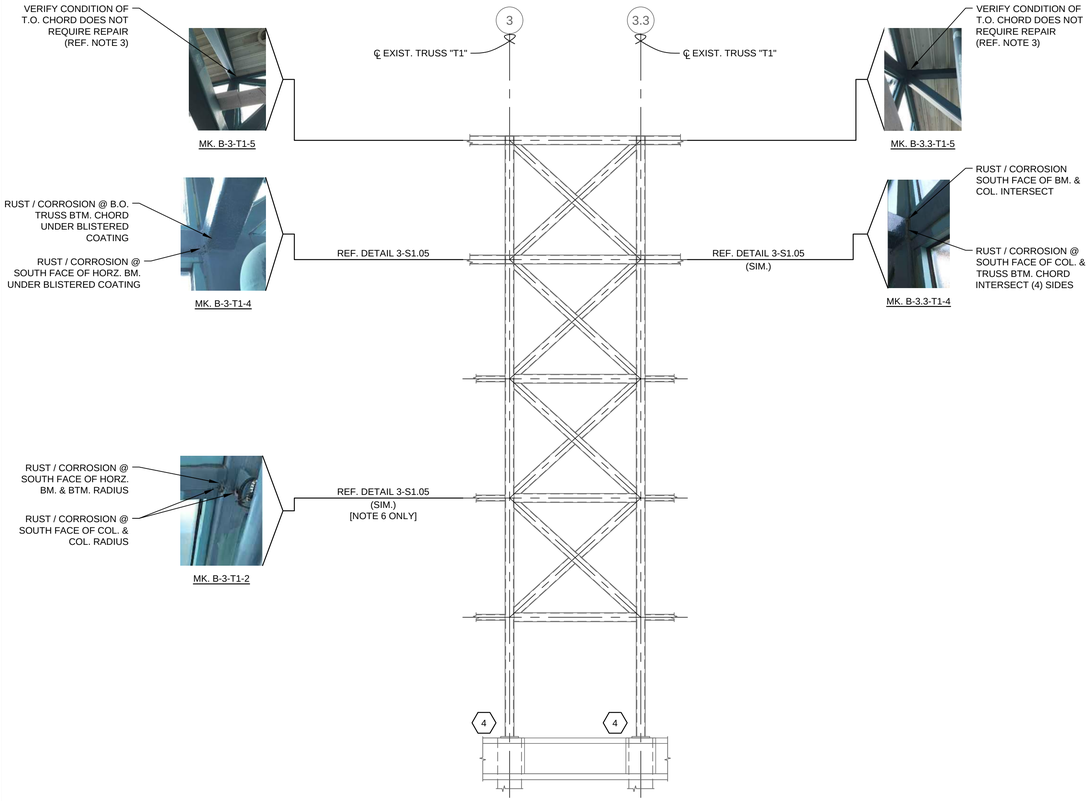
SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.04
DRAWING NUMBER

D
REVISION

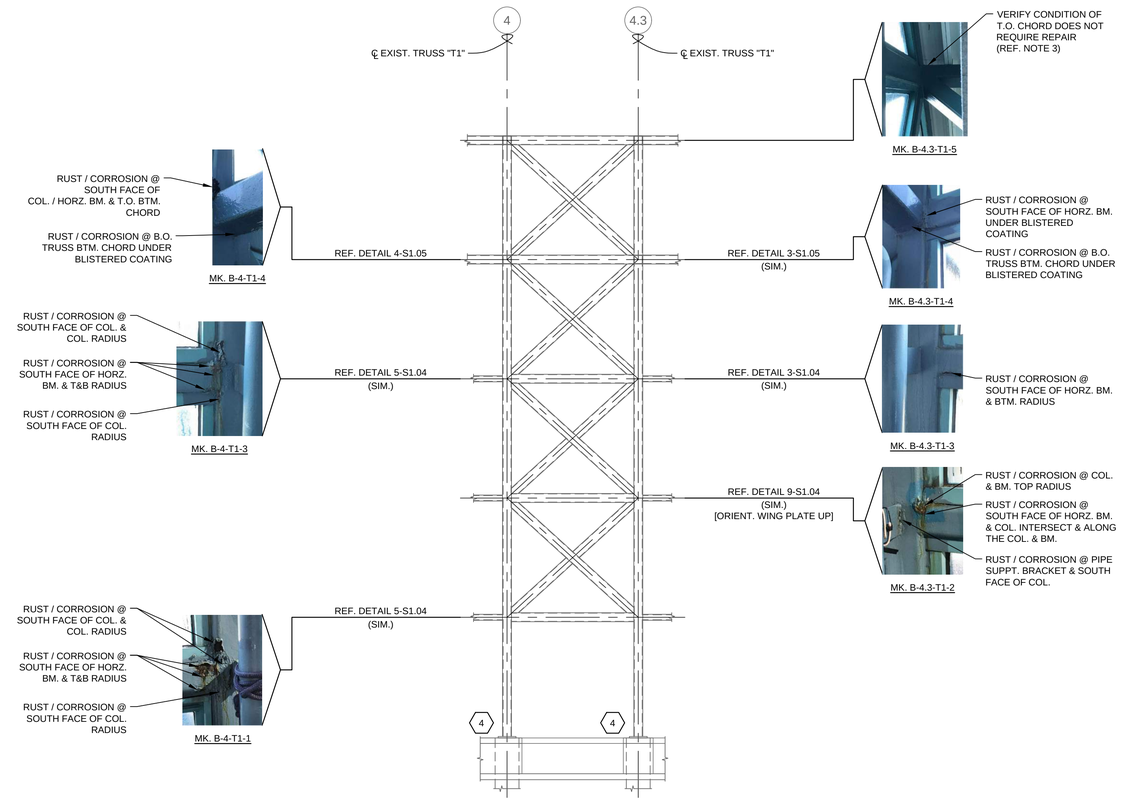
STATUS: **FINAL DESIGN SUBMITTAL RELEASED FOR BID**

I:\00992\0261\ENG\80-DRAWINGS\STRUCTURAL\S104-SD402-09920261.DWG 05/23/2022 17:16:16 BILL BAND



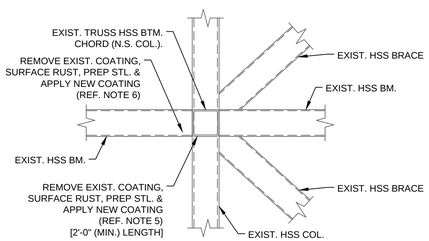
1 - DETAIL - TRUSS "T1" COL. LINE "B"

SCALE: 1/4" = 1'-0"



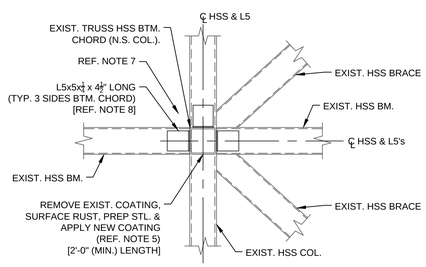
2 - DETAIL - TRUSS "T1" @ COL. LINE "B"

SCALE: 1/4" = 1'-0"



3 - DETAIL - B-3-T1-4 REPAIR

SCALE: 3/4" = 1'-0"



4 - DETAIL - B-4-T1-4 REPAIR

SCALE: 3/4" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.03 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING TOP CHORDS EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. WELD L5's TO HSS TRUSS CHORD, COL. & HORZ. BM. REF. DETAIL 2-S1.03 FOR WELD REQ.'s & INFO.
9. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

NOTES CTD. ...

9. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
10. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.05

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	ANGLE SECTION	L5x5x$\frac{1}{2}$" x 4$\frac{1}{2}$"	3	
02	PLATE	0'-8$\frac{1}{2}$"x2$\frac{1}{2}$"x$\frac{1}{4}$"	3	
03	BENT PLATE	0'-6"x2$\frac{1}{2}$"x$\frac{3}{8}$" x 5$\frac{1}{2}$"	8	
04	WING PLATE	0'-4"x11$\frac{3}{4}$"x$\frac{1}{4}$"	5	
05	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	195"	
06	FILLET WELD	$\frac{1}{4}$" EFF. THROAT	210"	
07	FILLET WELD	$\frac{5}{16}$" EFF. THROAT	20"	
08	BUTT WELD	COMPLETE PEN.	10"	
09	FLARE BEVEL WELD	PARTIAL PEN.	50"	

REV.NO.	DESCRIPTION	DATE
D	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
C	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
B	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022
A	90% DESIGN - NOT FOR CONSTRUCTION	02 MAR 2022

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LONG CENTER NATATORIUM STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 3 OF 11)

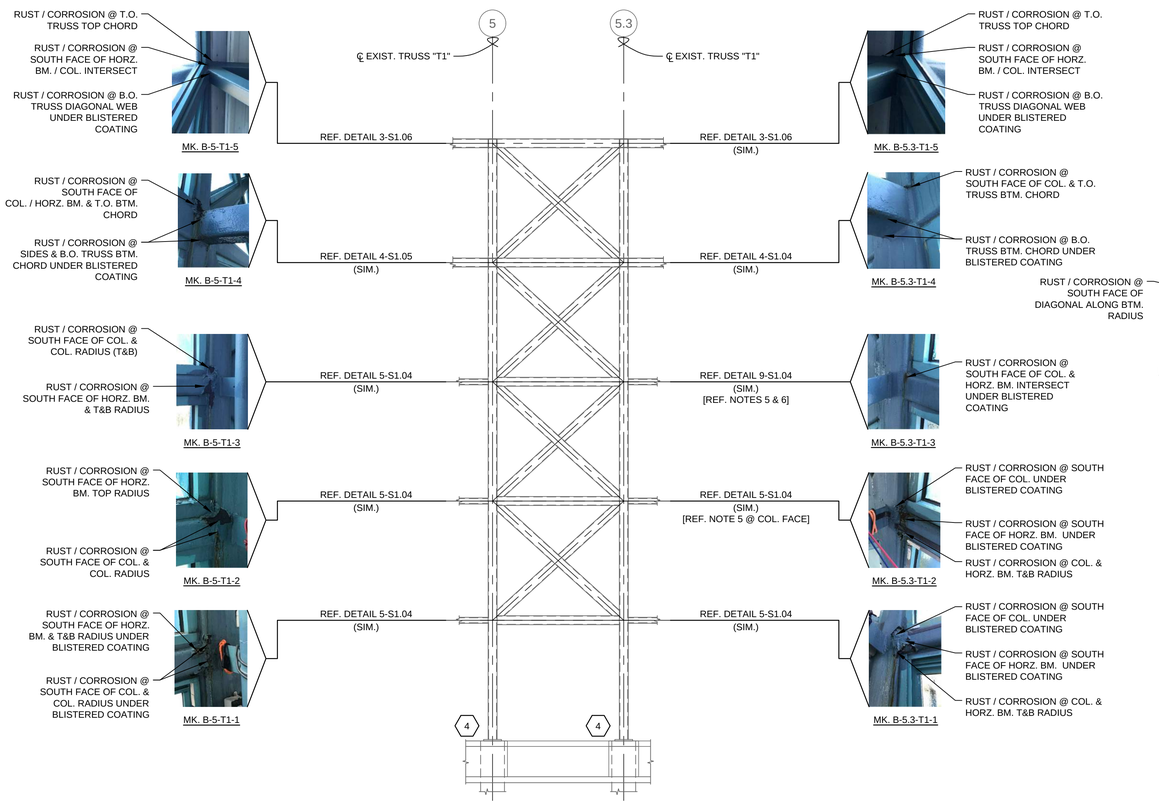
PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR:	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.05
DRAWING NUMBER
D
REVISION

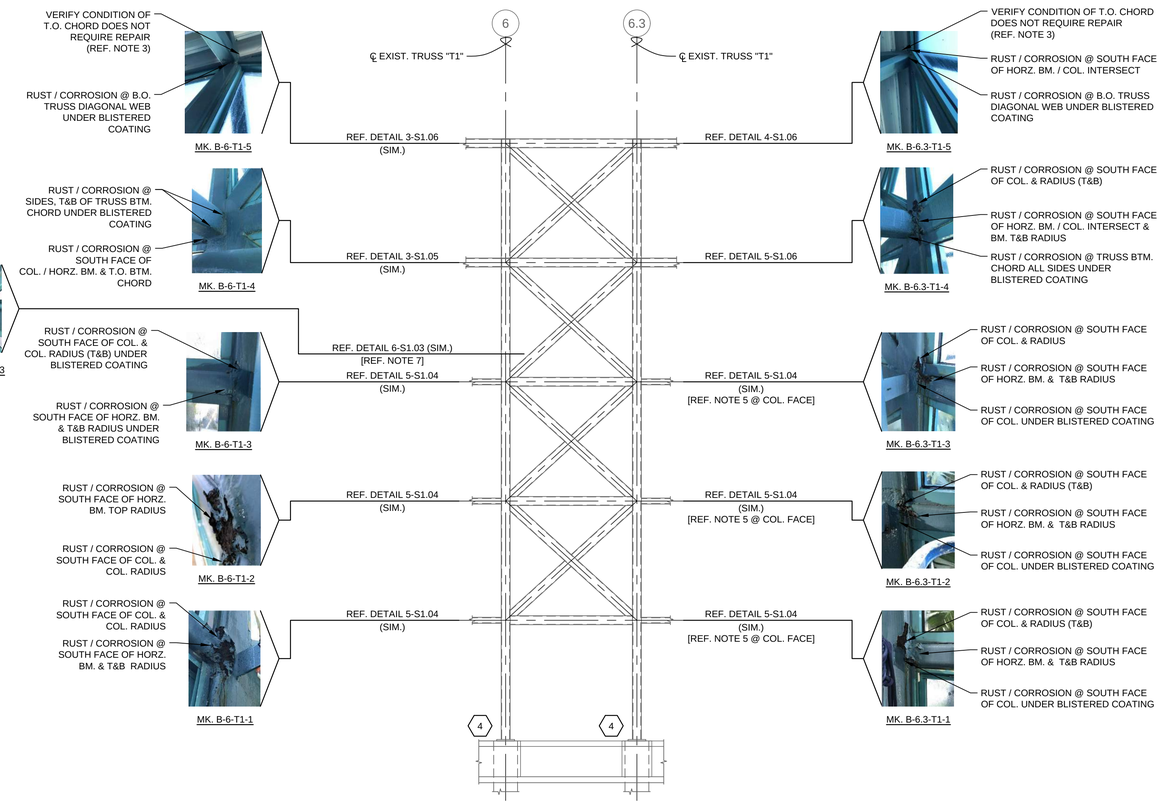
STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

I:\00992\0261\ENG\80-DRAWINGS\STRUCTURAL\S105-SD403-09920261.DWG 05/23/2022 17:21:12 BILL BAND



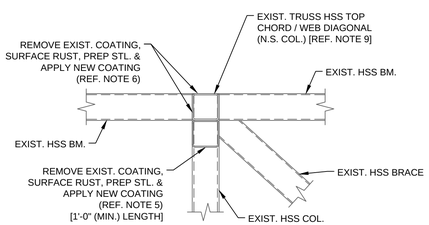
1 - DETAIL - TRUSS "T1" COL. LINE "B"

SCALE: 1/4" = 1'-0"



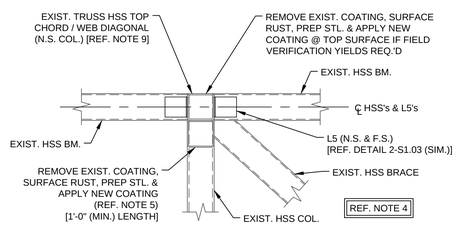
2 - DETAIL - TRUSS "T1" @ COL. LINE "B"

SCALE: 1/4" = 1'-0"



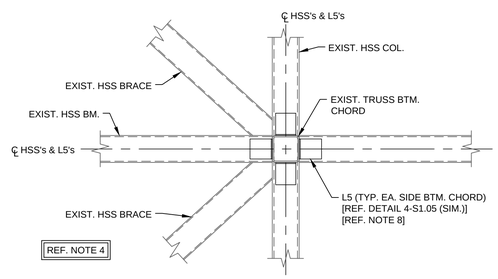
3 - DETAIL - B-5-T1-5 REPAIR

SCALE: 3/4" = 1'-0"



4 - DETAIL - B-6.3-T1-5 REPAIR

SCALE: 3/4" = 1'-0"



5 - DETAIL - B-6.3-T1-4 REPAIR

SCALE: 3/4" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.03 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING TOP CHORDS EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. WELD L5's TO HSS TRUSS CHORD, COL. & HORZ. BM. REF. DETAIL 2-S1.03 FOR WELD REQ.'s & INFO.
9. TRUSS WEB DIAGONAL SHOWN UNDERSIDE OF TOP CHORD FOR CLARITY.

NOTES CTD. ...

10. "(X)" SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
11. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.06

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	ANGLE SECTION	L5x5x$\frac{3}{4}$" x 4$\frac{1}{2}$"	9	
02	PLATE	0'-8$\frac{1}{2}$"x2$\frac{1}{2}$"x$\frac{1}{4}$"	12	
03	BENT PLATE	0'-6"x2$\frac{1}{2}$"x$\frac{3}{8}$" x 5$\frac{1}{2}$"	8	
04	WING PLATE	0'-4"x1$\frac{3}{4}$"x$\frac{1}{4}$"	22	
05	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	675"	
06	FILLET WELD	$\frac{1}{4}$" EFF. THROAT	210"	
07	FILLET WELD	$\frac{5}{16}$" EFF. THROAT	20"	
08	BUTT WELD	COMPLETE PEN.	40"	
09	FLARE BEVEL WELD	PARTIAL PEN.	50"	

REV.NO.	DESCRIPTION	DATE
D	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
C	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
B	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022
A	90% DESIGN - NOT FOR CONSTRUCTION	02 MAR 2022

REVISIONS

WILLIAM F. BAND, P.E.
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LONG CENTER NATATORIUM
STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 4 OF 11)

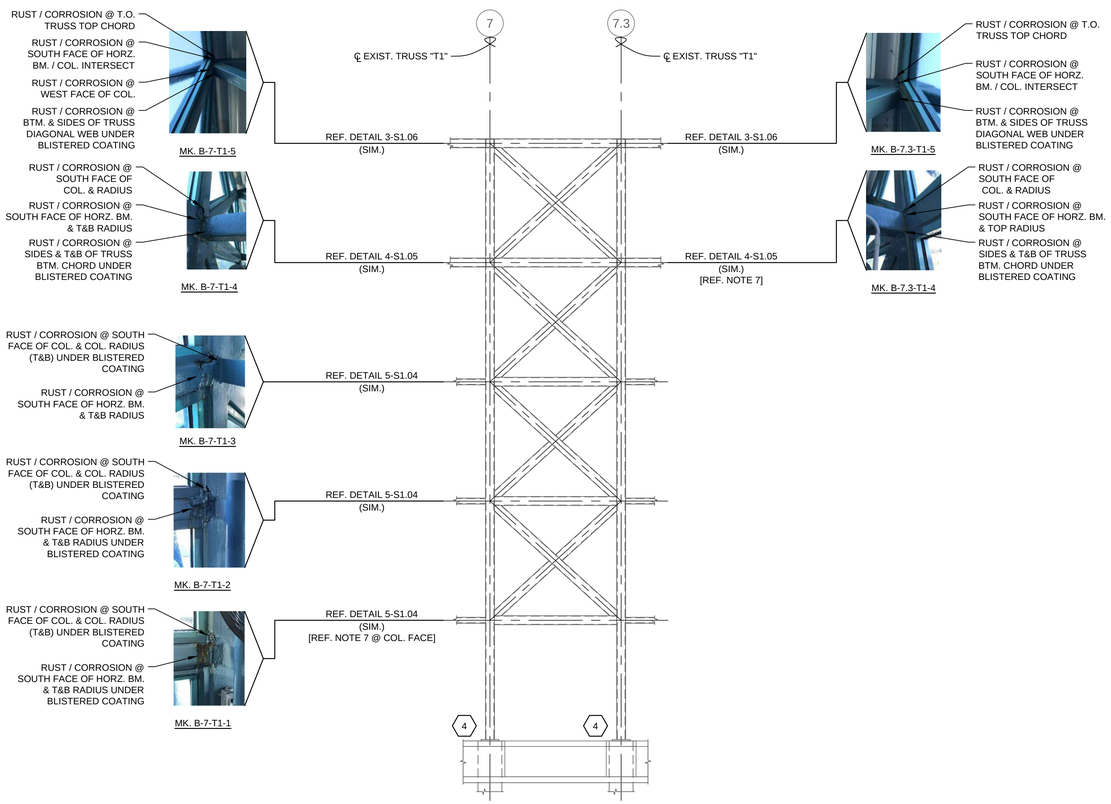
PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.06
DRAWING NUMBER
D
REVISION

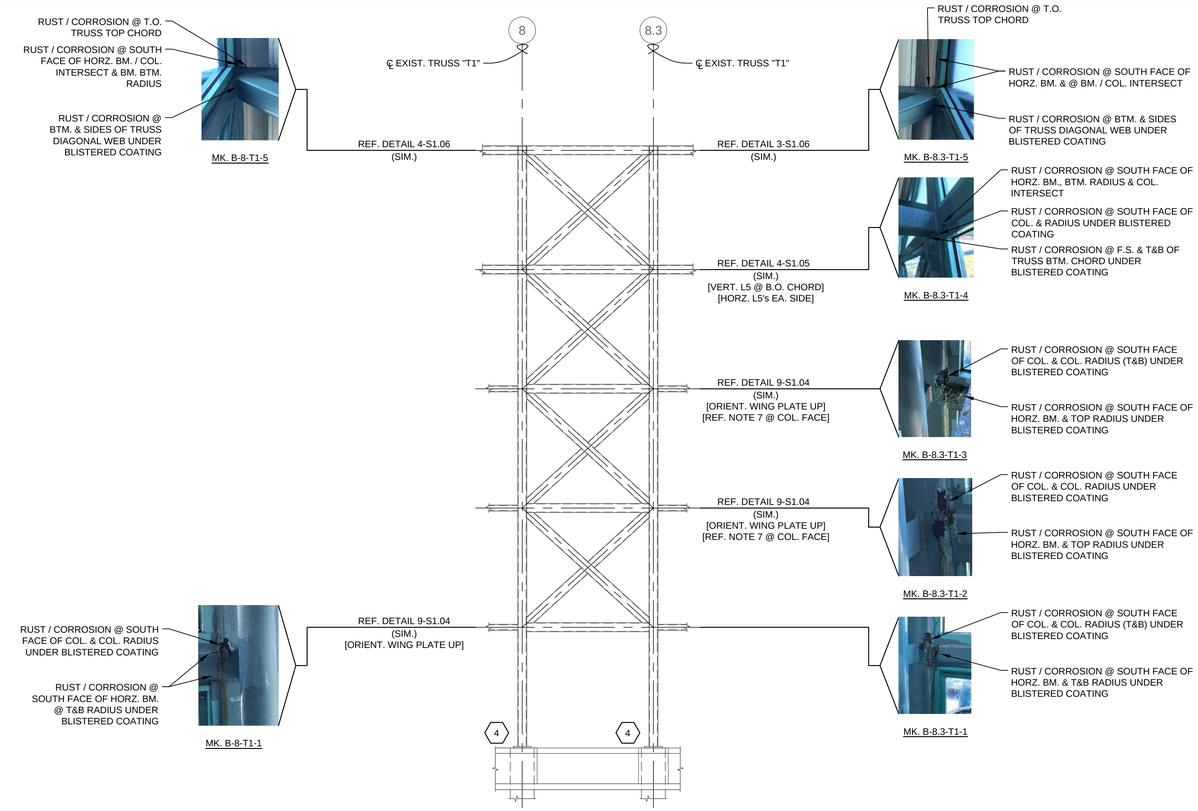
STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

I:\00992\0261\ENG\80-DRAWINGS\STRUCTURAL\S106-SD404-09920261.DWG 05/23/2022 18:05:20 BILL BAND



1 - DETAIL - TRUSS "T1" COL. LINE "B"

SCALE: 1/4" = 1'-0"



2 - DETAIL - TRUSS "T1" @ COL. LINE "B"

SCALE: 1/4" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.03 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING TOP CHORDS EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. WELD L5's TO HSS TRUSS CHORD, COL. & HORZ. BM. REF. DETAIL 2-S1.03 FOR WELD REQ.'s & INFO.
9. TRUSS WEB DIAGONAL SHOWN UNDERSIDE OF TOP CHORD FOR CLARITY.

NOTES CTD. ...

10. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
11. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.07

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	ANGLE SECTION	L5x5x$\frac{3}{4}$" x $4\frac{1}{2}$"	11	
02	PLATE	0'-$8\frac{3}{4}$"x$2\frac{1}{2}$"x$\frac{1}{4}$"	12	
03	BENT PLATE	0'-6"x$2\frac{1}{2}$"x$\frac{3}{8}$" x $5\frac{1}{2}$"	8	
04	WING PLATE	0'-4"x$11\frac{3}{4}$"x$\frac{1}{4}$"	9	
05	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	520"	
06	FILLET WELD	$\frac{1}{4}$" EFF. THROAT	210"	
07	FILLET WELD	$\frac{5}{16}$" EFF. THROAT	20"	
08	BUTT WELD	COMPLETE PEN.	20"	
09	FLARE BEVEL WELD	PARTIAL PEN.	50"	

REV.NO.	DESCRIPTION	DATE
D	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
C	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
B	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022
A	90% DESIGN - NOT FOR CONSTRUCTION	02 MAR 2022

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STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 5 OF 11)

PROJ. START DATE:	2021.NOV.
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR:	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.07
DRAWING NUMBER
D
REVISION

STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

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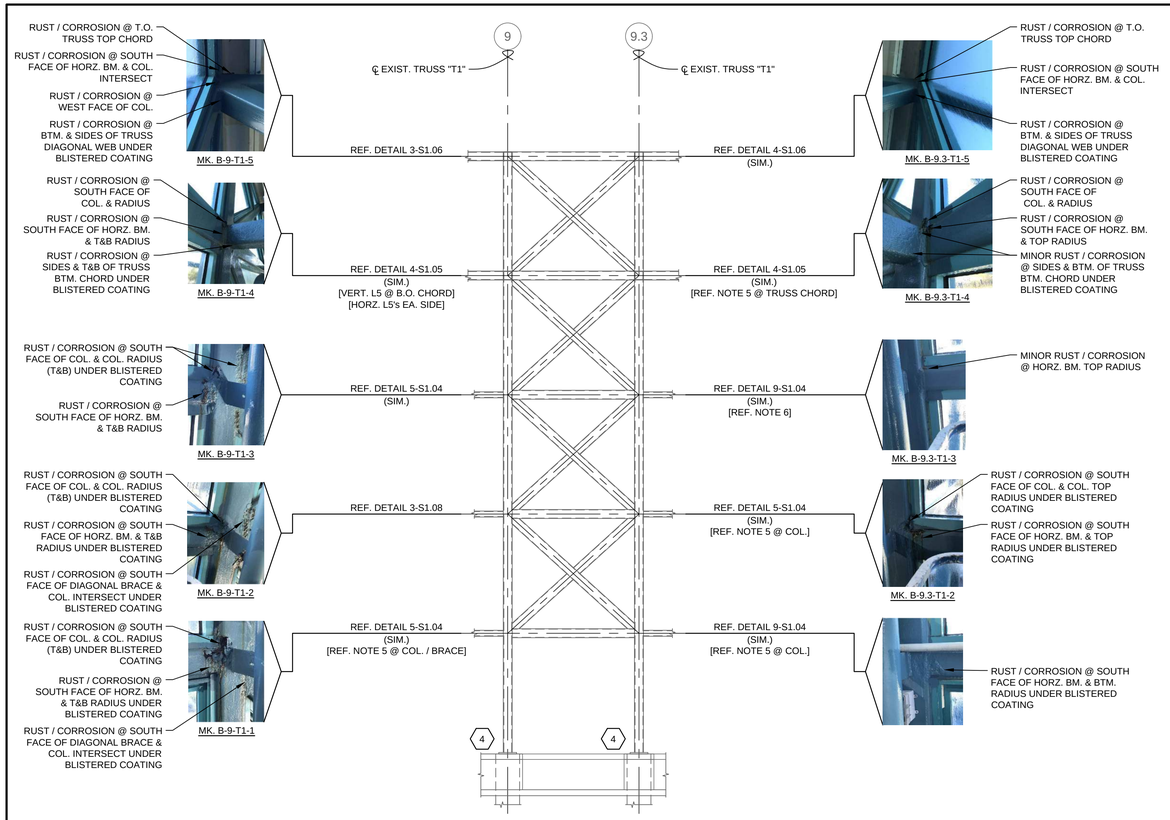
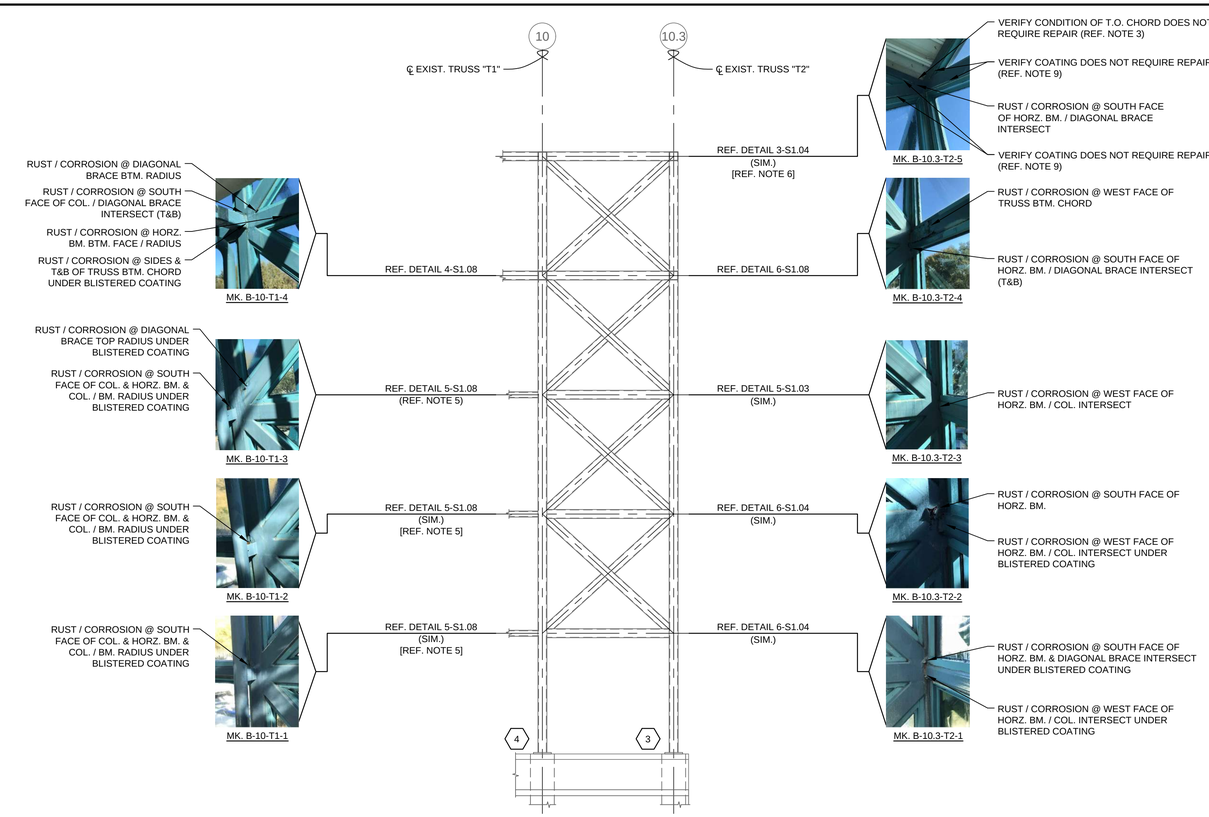


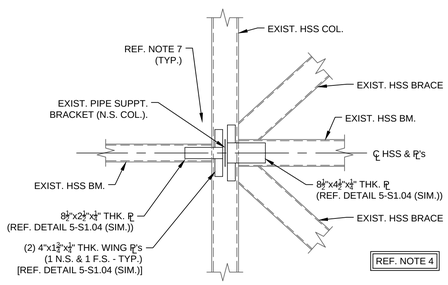
1 - DETAIL - TRUSS "T1" COL. LINE "B"

SCALE: 1/4" = 1'-0"



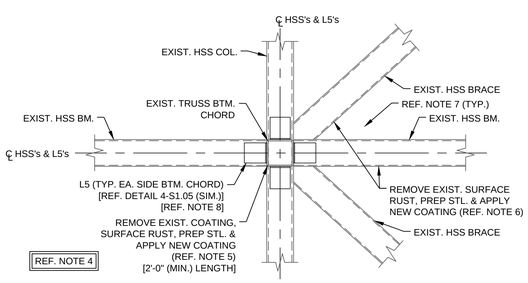
2 - DETAIL - TRUSS "T1" & "T2" @ COL. LINE "B"

SCALE: 1/4" = 1'-0"



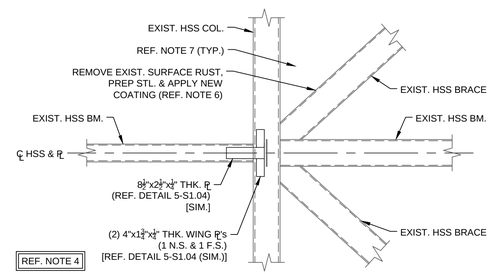
3 - DETAIL - B-9-T1-2 REPAIR

SCALE: 3/4" = 1'-0"



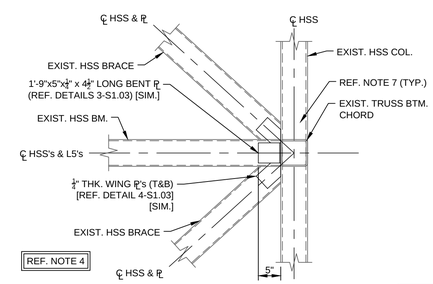
4 - DETAIL - B-10-T1-4 REPAIR

SCALE: 3/4" = 1'-0"



5 - DETAIL - B-10-T1-3 REPAIR

SCALE: 3/4" = 1'-0"



6 - DETAIL - B-10.3-T2-4 REPAIR

SCALE: 3/4" = 1'-0"

ESTIMATED BILL OF MATERIALS ... S1.08

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	ANGLE SECTION	L5x5x¾" x 4½"	15	
02	PLATE	0'-8½"x2½"x¾"	8	
03	PLATE	0'-8½"x4½"x¾"	1	
04	BENT PLATE	1'-9"x5"x¾" x 4½"	1	
05	BENT PLATE	0'-6"x2½"x¾" x 5½"	6	
06	BENT PLATE	0'-6"x2½"x¾" x 2½"	1	
07	WING PLATE	0'-4"x1¾"x¼"	17	
08	WING PLATE	0'-4"x3¾"x¼"	6	
09	FILLET WELD	3/16" EFF. THROAT	870"	
10	FILLET WELD	¼" EFF. THROAT	180"	
11	FILLET WELD	5/16" EFF. THROAT	25"	
12	BUTT WELD	COMPLETE PEN.	50"	
13	FLARE BEVEL WELD	PARTIAL PEN.	70"	

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.03 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING TOP CHORDS EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. WELD L5's TO HSS TRUSS CHORD, COL. & HORZ. BM. REF. DETAIL 2-S1.03 FOR WELD REQ.'s & INFO.

NOTES CTD. ...

9. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
10. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

REV.NO.	DESCRIPTION	DATE
D	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
C	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
B	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022
A	90% DESIGN - NOT FOR CONSTRUCTION	02 MAR 2022

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STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 6 OF 11)

PROJ. START DATE:	2021.NOV.
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.08
DRAWING NUMBER
D
REVISION

STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

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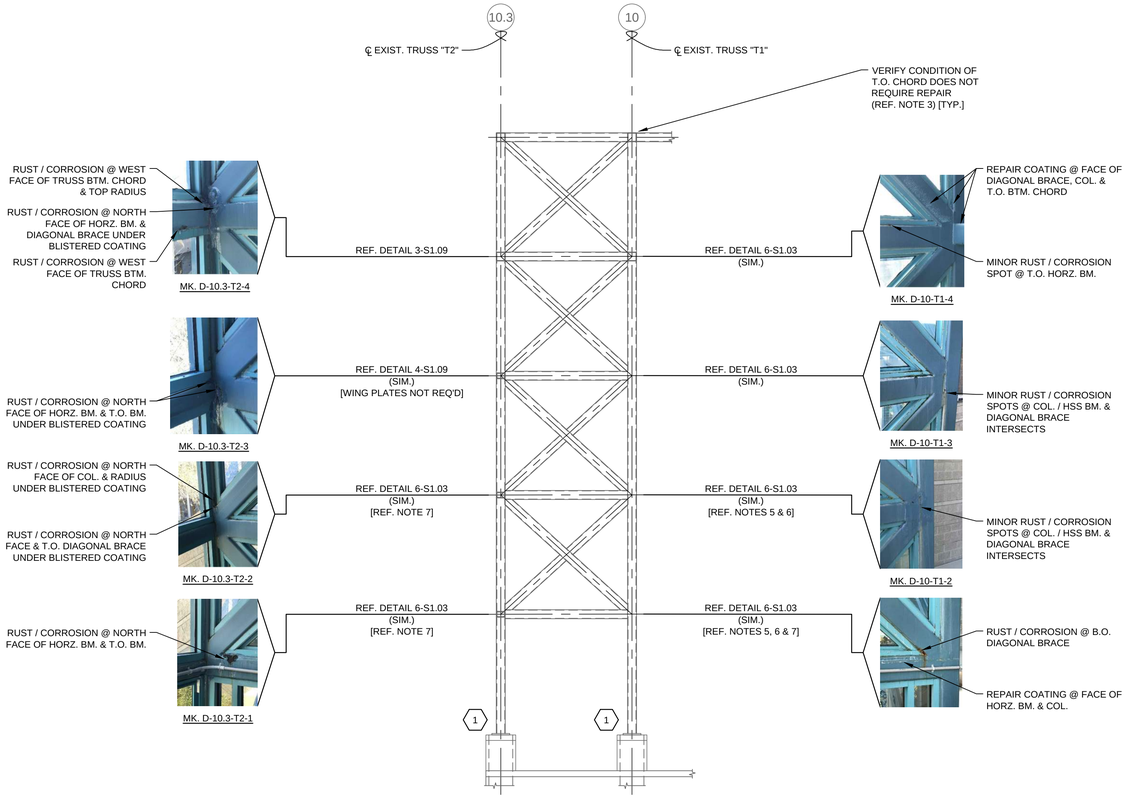


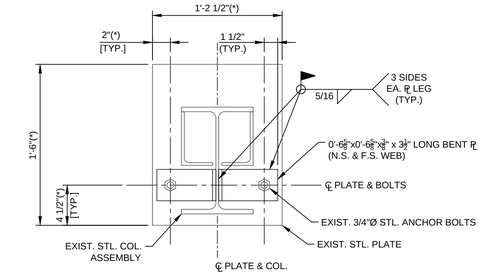
1 - DETAIL - TRUSS "T1" & "T2" @ COL. LINE "D"

SCALE: 1/4" = 1'-0"

2 - KEYNOTES - COL. BASE PLATE REPAIRS

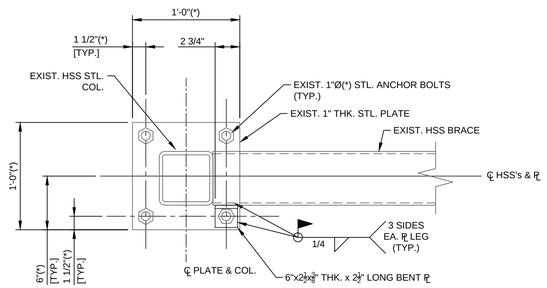
SCALE: N/A

1. REMOVE EXISTING COATING FROM EXPOSED PLATE TOP & SIDE SURFACES.
   REMOVE ALL RUST FROM PLATE & ANCHOR BOLTS & HARDWARE SURFACES TO BARE METAL.
   REMOVE & REPLACE SEVERELY CORRODED NUTS & WASHERS.
   PREP ALL PLATE, COLUMN, BOLTS & HARDWARE STEEL SURFACES AS REQUIRED.
   REPAIR ANCHOR BOLTS PER DETAIL 8-S1.09 IF BOLT OR THREADS DAMAGED BEYOND REPAIR.
   INSTALL NEW COATING SYSTEM.
2. REFERENCE KEYNOTE 1 FOR REMOVING EXISTING RUST, COATING & BOLT HARDWARE.
   REFERENCE KEYNOTE 1 FOR PREP OF EXISTING STEEL.
   REINFORCE PLATE AS INDICATED DETAIL 5-S1.09.
   REPAIR ANCHOR BOLTS PER DETAIL 8-S1.09 IF BOLT OR THREADS DAMAGED BEYOND REPAIR.
   INSTALL NEW COATING SYSTEM.
3. REFERENCE KEYNOTE 1 FOR REMOVING EXISTING RUST, COATING & BOLT HARDWARE.
   REFERENCE KEYNOTE 1 FOR PREP OF EXISTING STEEL.
   REINFORCE PLATE AS INDICATED DETAIL 6-S1.09.
   REPAIR ANCHOR BOLTS PER DETAIL 8-S1.09 IF BOLT OR THREADS DAMAGED BEYOND REPAIR.
   INSTALL NEW COATING SYSTEM.
4. REFERENCE KEYNOTE 1 FOR REMOVING EXISTING RUST, COATING & BOLT HARDWARE.
   REFERENCE KEYNOTE 1 FOR PREP OF EXISTING STEEL.
   REINFORCE PLATE AS INDICATED DETAIL 7-S1.09.
   REPAIR ANCHOR BOLTS PER DETAIL 8-S1.09 IF BOLT OR THREADS DAMAGED BEYOND REPAIR.
   INSTALL NEW COATING SYSTEM.



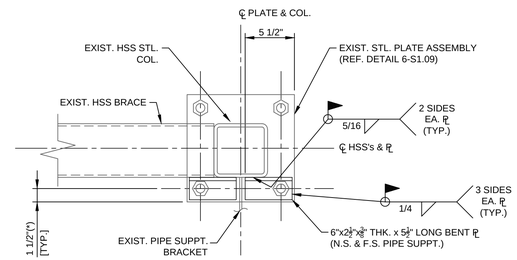
5 - DETAIL - EXIST. BASE PLATE MOD KEY NOTE 2

SCALE: 1 1/2" = 1'-0"



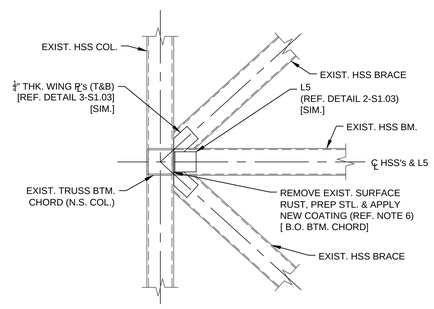
6 - DETAIL - EXIST. BASE PLATE MOD KEY NOTE 3

SCALE: 1 1/2" = 1'-0"



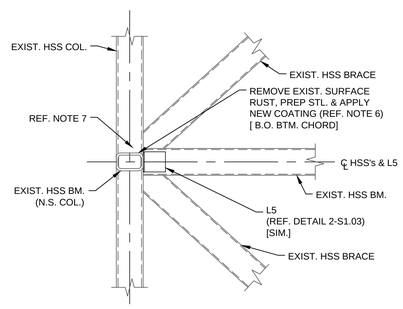
7 - DETAIL - EXIST. BASE PLATE MOD KEY NOTE 4

SCALE: 1 1/2" = 1'-0"



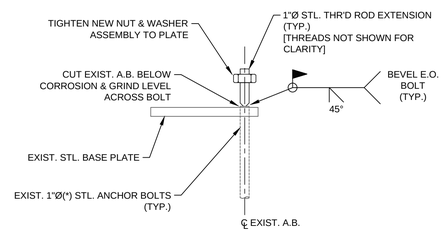
3 - DETAIL - D-10.3-T2-4 REPAIR

SCALE: 3/4" = 1'-0"



4 - DETAIL - D-10.3-T2-3 REPAIR

SCALE: 3/4" = 1'-0"



8 - DETAIL - EXIST. BASE PLATE A.B. MOD

SCALE: 3" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.03 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING TOP CHORDS EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.

NOTES CTD. ...

8. " ⟨X⟩ " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
9. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.09

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	ANGLE SECTION	L5x5x3/4" x 4 1/2"	2	
02	WING PLATE	0'-4"x3 3/8"x3/4"	2	
03	FILLET WELD	3/16" EFF. THROAT	70"	
04	BUTT WELD	COMPLETE PEN.	5"	
05	FLARE BEVEL WELD	PARTIAL PEN.	10"	

REV.NO.	DESCRIPTION	DATE
D	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
C	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
B	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022
A	90% DESIGN - NOT FOR CONSTRUCTION	02 MAR 2022

REVISIONS

WILLIAM F. BAND, P.E.
No. 67838

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LONG CENTER NATATORIUM STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 7 OF 11)

PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.09
DRAWING NUMBER
D
REVISION

STATUS: **FINAL DESIGN SUBMITTAL RELEASED FOR BID**

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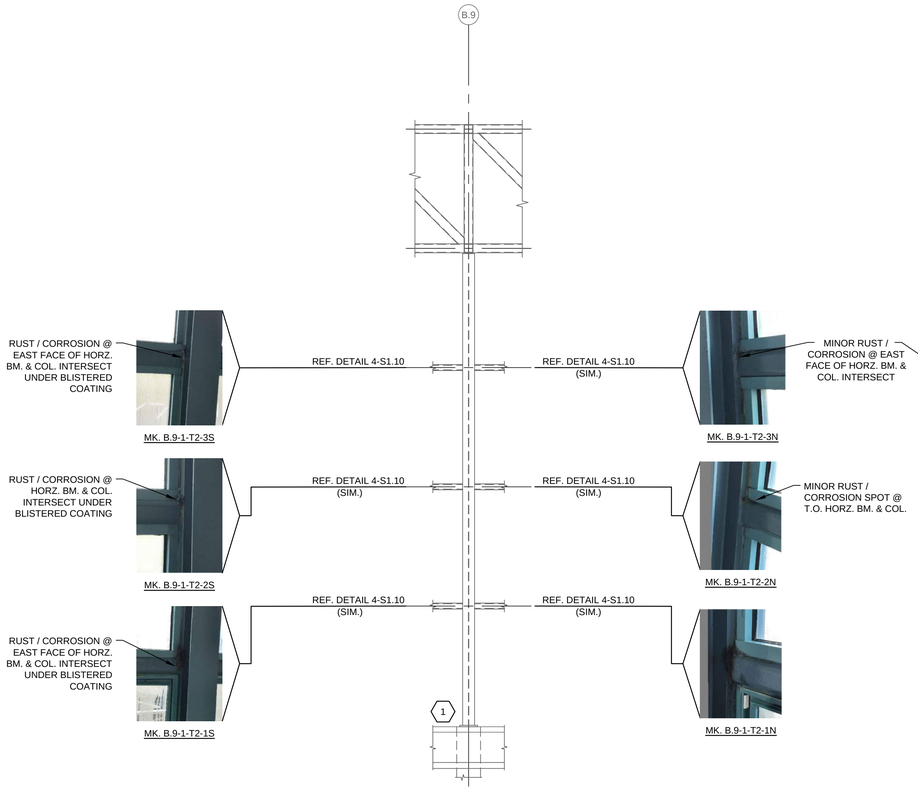
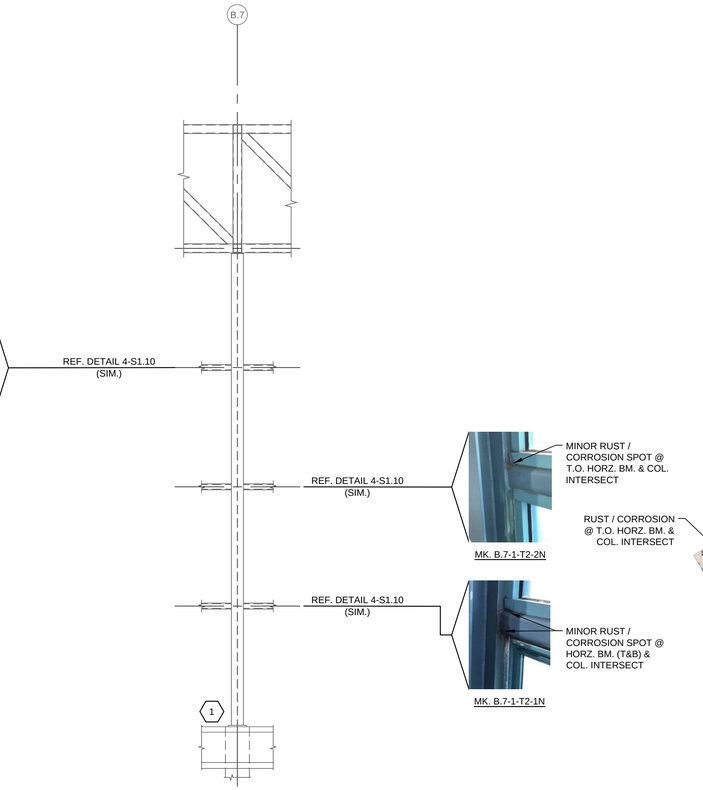


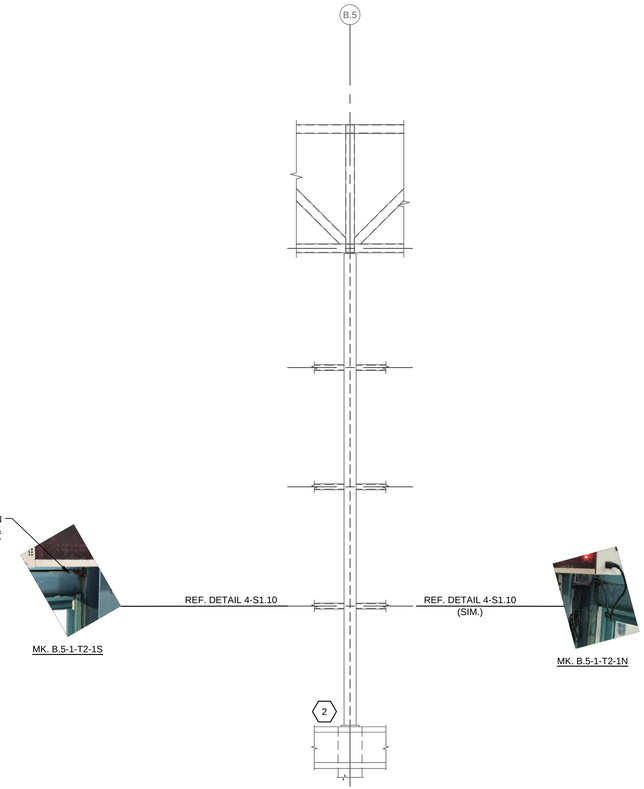
1 - DETAIL - TRUSS "2" & COL. LINE "1" FRMG.

SCALE: 1/4" = 1'-0"



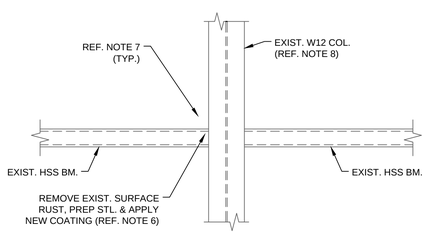
2 - DETAIL - TRUSS "2" & COL. LINE "1" FRMG.

SCALE: 1/4" = 1'-0"



3 - DETAIL - TRUSS "2" & COL. LINE "1" FRMG.

SCALE: 1/4" = 1'-0"



4 - DETAIL - B.9-1-T2-3 REPAIR

SCALE: 3/4" = 1'-0"

TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE:

TRUSS CONNECTION LOCATION MK. # = B.9-1-T2-3S

B.9	= EAST / WEST ORIENTED COLUMN LINE DIRECTION ON PLAN 1-S1.00.
1	= NORTH / SOUTH ORIENTED COLUMN LINE DIRECTION ON PLAN 1-S1.00.
T1	= EXISTING TRUSS TYPE T1 OR T2 AS NOTED ON PLAN 1-S1.00 & TRUSS DETAIL ELEVATIONS.
3	= ELEVATION ABOVE THE EXISTING SLAB-ON-GRADE AS INDICATED w/ " X " SYMBOL ON DWG.'s S1.01 & S1.02.
S	= SOUTH / NORTH SIDE OF THE EXISTING COLUMN.

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" THIS DWG. FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) CONDITIONS OF STEEL MAY HAVE CHANGED SINCE SITE REVIEWS. NOTIFY THE ENGINEER OF SITE CONDITIONS THAT MAY BE DIFFERENT THAN INDICATED. IN ADDITION NOTIFY THE ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. THE W12 COL.'s INSTALLED w/ ADDITIONAL STEEL SECTION @ THE O/F OF THE W12 FLANGE. RECORD DWG.'s REVIEWED COULD NOT CONFIRM THE SECTION. SITE VISIT REVIEW APPEARED TO INDICATE (2) L6x3 SECTIONS INSTALLED w/ (1) L6x3 EACH SIDE OF THE WEB. FIELD VERIFY AS REQ.'D & NOT SHOWN ELEVATIONS FOR CLARITY. REFERENCE DETAIL 5-S1.11 FOR CLARITY.

NOTES CTD. ...

9. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
10. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.10

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	BENT PLATE	0'-6$\frac{3}{8}$"x6$\frac{5}{8}$"x $\frac{3}{8}$" x 3$\frac{1}{4}$"	2	
02	FILLET WELD	$\frac{5}{16}$" EFF. THROAT	70"	

REV.NO.	DESCRIPTION	DATE
C	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
B	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
A	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022

REVISIONS

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STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 8 OF 11)

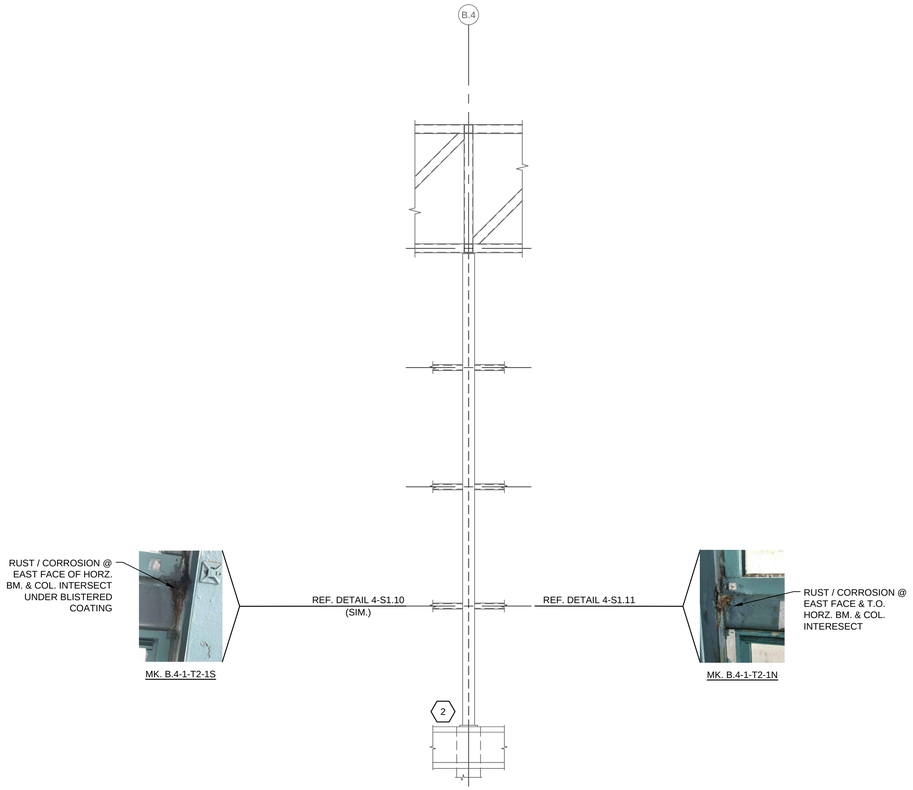
PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR:	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.10
DRAWING NUMBER
C
REVISION

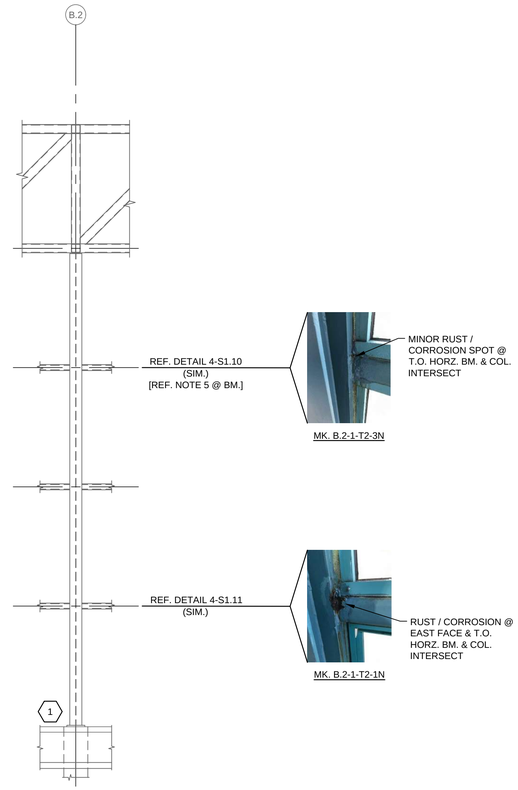
STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

I:\00992\0261\ENG\80-DRAWINGS\STRUCTURAL\S110-SD408-09920261.DWG 05/23/2022 18:29:57 BILL BAND



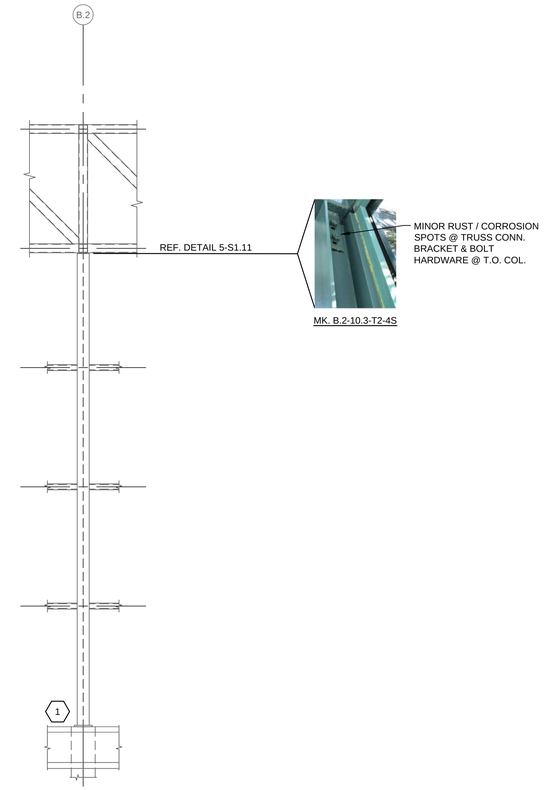
1 - DETAIL - TRUSS "2" & COL. LINE "1" FRMG.

SCALE: 1/4" = 1'-0"



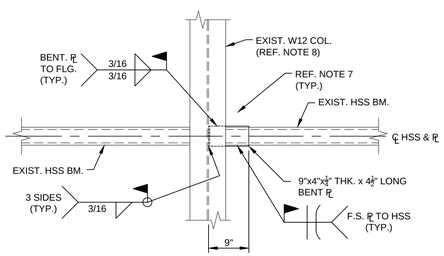
2 - DETAIL - TRUSS "2" & COL. LINE "1" FRMG.

SCALE: 1/4" = 1'-0"



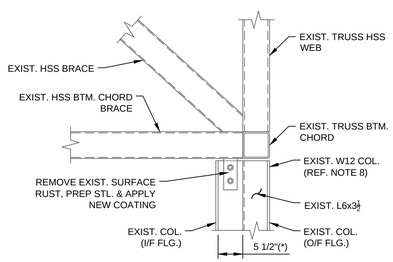
3 - DETAIL - TRUSS "2" & COL. LINE "10.3" FRMG.

SCALE: 1/4" = 1'-0"



4 - DETAIL - B.4-1-T2-1 REPAIR

SCALE: 3/4" = 1'-0"



5 - DETAIL - B.2-10.3-T2-4 REPAIR

SCALE: 3/4" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.10 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) CONDITIONS OF STEEL MAY HAVE CHANGED SINCE SITE REVIEWS. NOTIFY THE ENGINEER OF SITE CONDITIONS THAT MAY BE DIFFERENT THAN INDICATED. IN ADDITION NOTIFY THE ENGINEER OF AREAS THAT ARE NOT CURRENTLY INDICATED BUT MAY DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. THE W12 COL.'s INSTALLED w/ ADDITIONAL STEEL SECTION @ THE I/F OF THE W12 EXTR. FLANGE. RECORD DWG.'s REVIEWED COULD NOT CONFIRM THE SECTION. SITE VISIT REVIEW APPEARED TO INDICATE (2) L6x3 SECTIONS INSTALLED w/ (1) L6x3 EACH SIDE OF THE WEB. FIELD VERIFY AS REQ.'D & NOT SHOWN ELEVATIONS FOR CLARITY. REFERENCE DETAIL 5-S1.11 FOR CLARITY.

NOTES CTD. ....

9. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
10. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.11

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	BENT PLATE	0'-6 5/8"x6 5/8"x 3/8" x 3 3/4"	2	
02	BENT PLATE	0'-9"x4"x1/4" x 4 1/2"	2	
03	FILLET WELD	3/16" EFF. THROAT	50"	
04	FILLET WELD	3/16" EFF. THROAT	70"	
05	FLARE BEVEL WELD	PARTIAL PEN.	20"	

REV.NO.	DESCRIPTION	DATE
C	FINAL DESIGN - RELEASED FOR BID	23 MAY 2022
B	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
A	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022

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STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 9 OF 11)

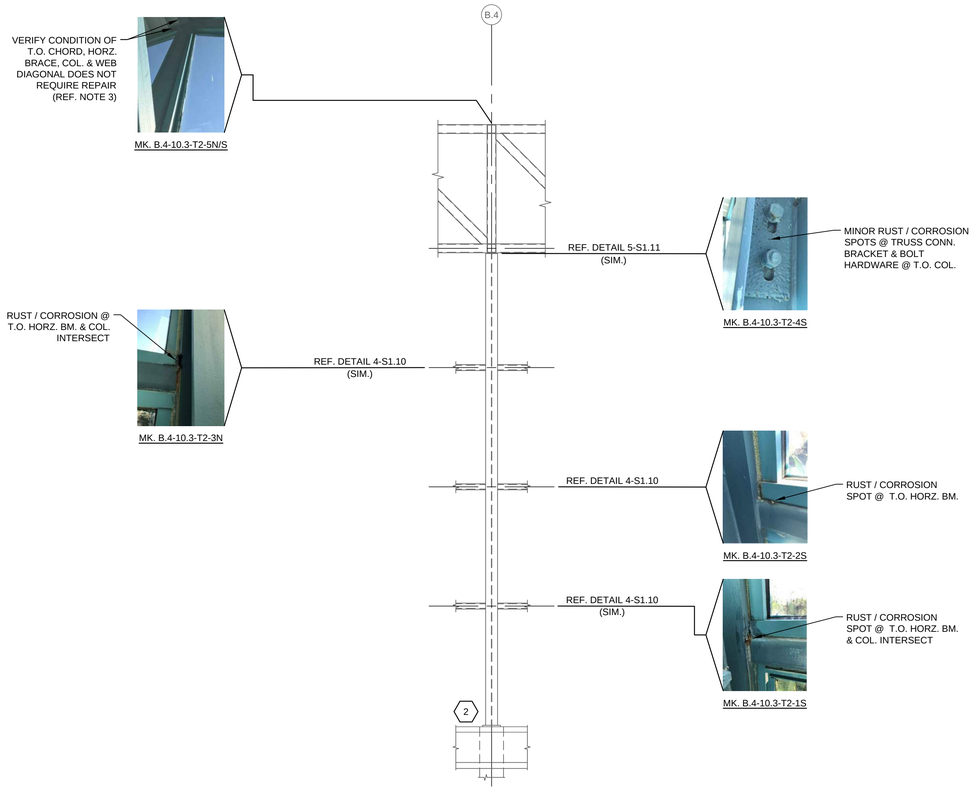
PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR.	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.11
DRAWING NUMBER
C
REVISION

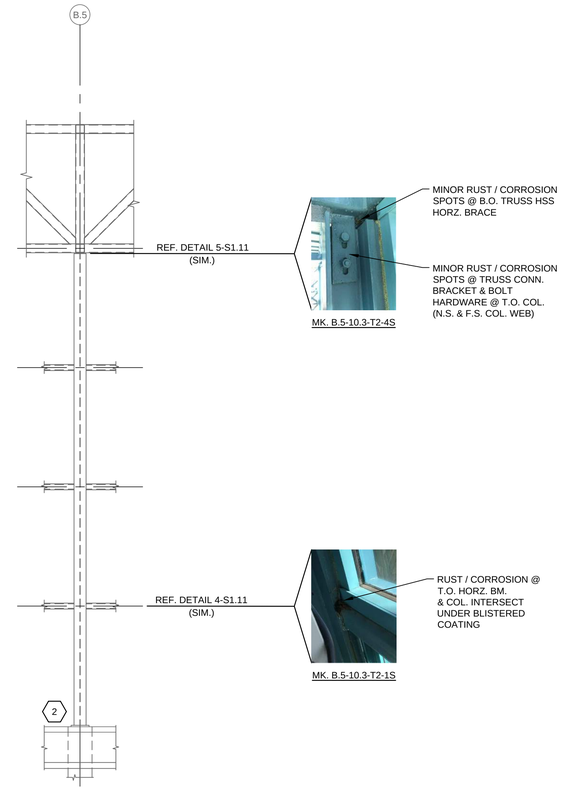
STATUS: FINAL DESIGN SUBMITTAL RELEASED FOR BID

I:\00992\0261\ENG\80-DRAWINGS\STRUCTURAL\S111-SD409-09920261.DWG 05/23/2022 18:32:49 BILL BAND



1 - DETAIL - TRUSS "2" & COL. LINE "10.3" FRMG.

SCALE: 1/4" = 1'-0"



2 - DETAIL - TRUSS "2" & COL. LINE "10.3" FRMG.

SCALE: 1/4" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
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   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.10 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING STEEL SECTIONS NOTED EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE CURRENTLY INDICATED BUT MAY DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. THE W12 COL.'s INSTALLED w/ ADDITIONAL STEEL SECTION @ THE I/F OF THE W12 EXTR. FLANGE. RECORD DWG.'s REVIEWED COULD NOT CONFIRM THE SECTION. SITE VISIT REVIEW APPEARED TO INDICATE (2) L6x3 SECTIONS INSTALLED w/ (1) L6x3 EACH SIDE OF THE WEB. FIELD VERIFY AS REQ.'D & NOT SHOWN ELEVATIONS FOR CLARITY. REFERENCE DETAIL 5-S1.11 FOR CLARITY.

NOTES CTD. ...

9. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
10. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.12

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	BENT PLATE	0'-6$\frac{5}{8}$"x6$\frac{5}{8}$"x$\frac{3}{8}$" x 3$\frac{1}{4}$"	4	
02	BENT PLATE	0'-9"x4"x$\frac{1}{2}$" x 4$\frac{1}{2}$"	1	
03	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	25"	
04	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	140"	
05	FLARE BEVEL WELD	PARTIAL PEN.	10"	

REV.NO.	DESCRIPTION	DATE
C	FINAL DESIGN -RELEASED FOR BID	23 MAY 2022
B	FINAL DESIGN - FINAL REVIEW NOT FOR CONSTRUCTION	09 MAY 2022
A	100% DESIGN - NOT FOR CONSTRUCTION	18 MAR 2022

REVISIONS

WILLIAM F. BAND, P.E.
No. 67838

McKIM&CREED
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CLEARWATER
BRIGHT AND BEAUTIFUL · BAY TO BEACH

LONG CENTER NATATORIUM STRUCTURAL FRAME REPAIRS

STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 10 OF 11)

PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
CHECKED	WFB / AEA
PROJ. MGR:	AAH

SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.12
DRAWING NUMBER
C
REVISION

STATUS: **FINAL DESIGN SUBMITTAL RELEASED FOR BID**

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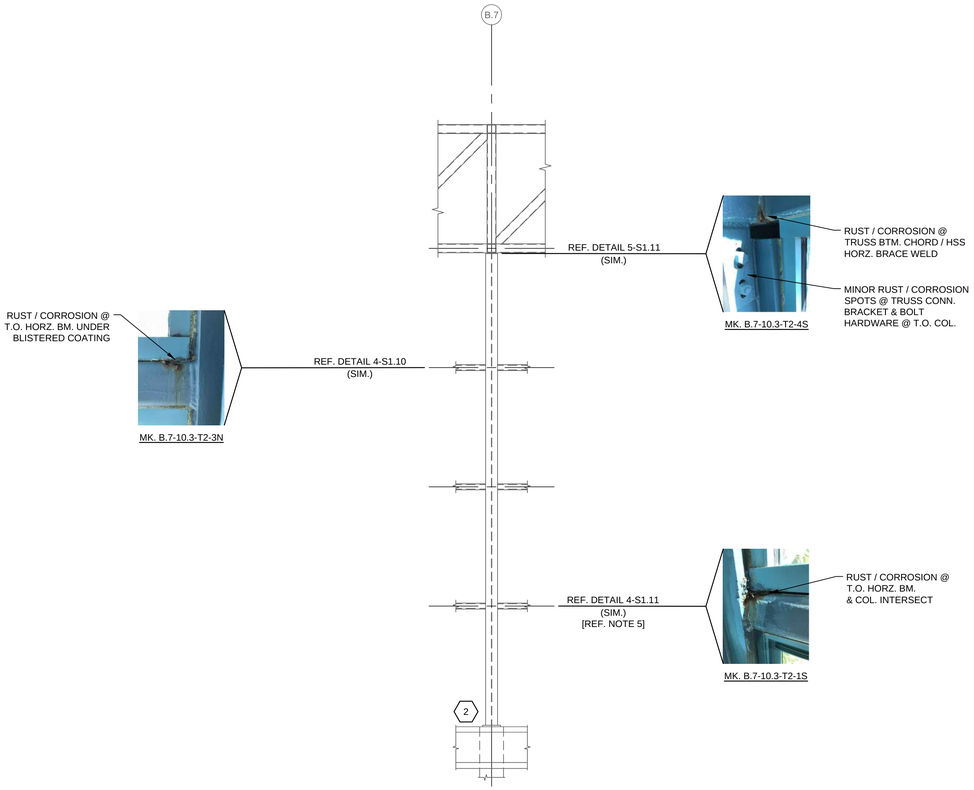
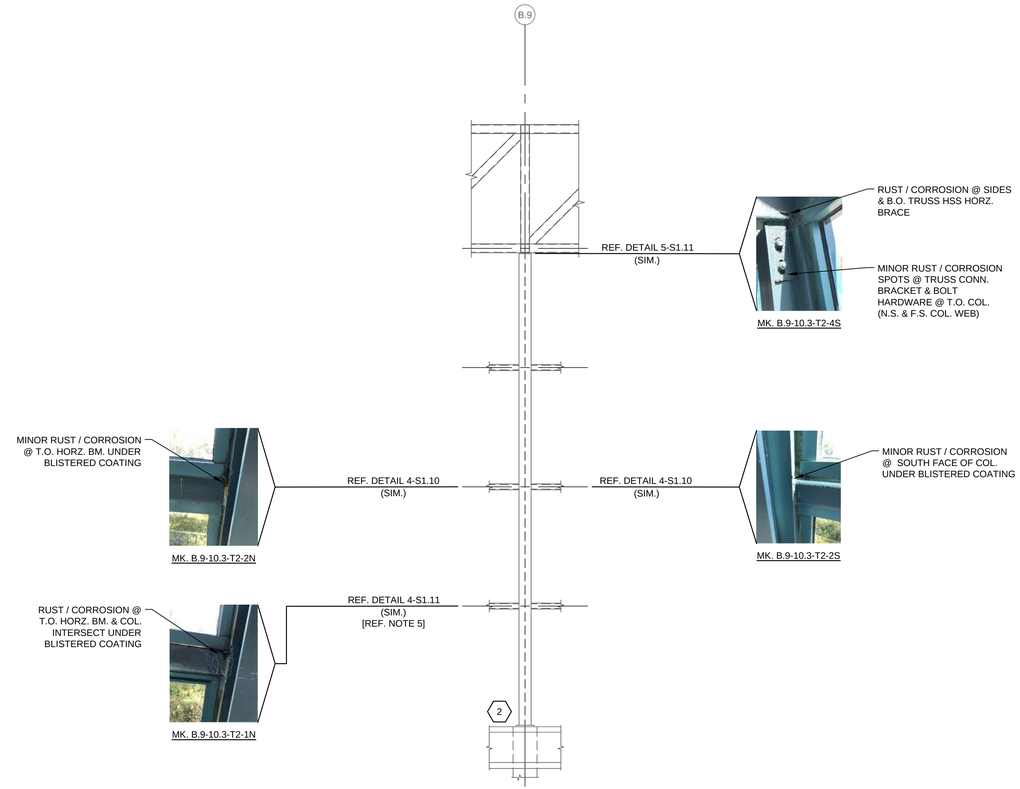


1 - DETAIL - TRUSS "2" & COL. LINE "10.3" FRMG.

SCALE: 1/4" = 1'-0"



2 - DETAIL - TRUSS "2" & COL. LINE "10.3" FRMG.

SCALE: 1/4" = 1'-0"

NOTES:

1. IN GENERAL REPAIR OF THE EXISTING STRUCTURAL STEEL TRUSSES AND THE SECONDARY EXTERIOR WALL BEAMS INVOLVES REPAIRS TO INTERIOR VERTICAL, HORIZONTAL & DIAGONAL SURFACES OF THE TRUSSES, COLUMNS, CONNECTION PLATES OR ANGLES, BASE PLATES AND ANCHOR BOLTS AND HARDWARE. IN GENERAL REPAIR WORK INCLUDES THE FOLLOWING:
   a.) REMOVING EXISTING COATINGS TO BARE METAL.
   b.) REMOVING SURFACE RUST OR THRU WALL RUST AND CLEANING SURFACES TO BARE METAL.
   c.) PREPARING BARE METAL SURFACES TO SSPC-SP6 "COMMERCIAL BLAST CLEANING" CRITERIA.
   d.) WELDING NEW STEEL PLATE OR ANGLE SECTIONS TO THE EXISTING STEEL SECTIONS. REGARDING FIELD WELDING AND PREPARATION TO SSPC-SP6 CRITERIA, THE MAXIMUM BASE METAL TEMPERATURE AT DEMARCATION BETWEEN BRIGHT METAL AND THE EXISTING COATINGS TO BE CONFIRMED w/ THE USE OF 182° F TEMPILSTIK's BETWEEN WELD PASSES.
   e.) INSTALL NEW COATING SYSTEM ON THE REPAIRED AREAS TO MATCH
2. CODE FOR UTILIZING TRUSS CONNECTION LOCATIONS MARK NUMBERS AS FOLLOWS:
   a.) COL. ID E/W DIRECTION - COL. ID N/S DIRECTION - TRUSS TYPE - ELEVATION ABOVE BASE PLATE.
   b.) COORDINATE w/ TRUSS ELEVATIONS DWG.'s S-1.01 & S-1.02 FOR HEIGHT CODES 0 TO 5.
   c.) COORDINATE w/ THE "TRUSS CONN. LOCATION MK. # LEGEND EXAMPLE" DWG. S1.10 FOR ADDITIONAL INFORMATION.

NOTES CTD. ...

3. REGARDING VERIFYING CONDITION OF EXISTING STEEL, NOTE THE FOLLOWING:
   a.) DURING SITE VISITS NOT ALL AREAS OF THE EXISTING FACILITY COULD BE EASILY ACCESSED SAFELY w/ THE LIFT.
   b.) CONTRACTOR TO VERIFY IF EXISTING STEEL SECTIONS NOTED EXHIBITING SIGNS OF RUST, CORROSION OR LOSS OF COATING.
   c.) NOTIFY ENGINEER OF AREAS THAT ARE CURRENTLY INDICATED BUT DISPLAY RUST, CORROSION, AND / OR COATING PEELING OR LOSS FOR DIRECTIONS HOW TO PROCEED.
4. COORDINATE w/ DETAILS REFERENCED FOR ANGLE / PLATE LAYOUT DIM.'s & WELD REQ.'s. U.N.O..
5. IF COATING REMOVAL YIELDS SURFACE PITTING GRIND SMOOTH & TO SURFACE PREP. REQ.'s.
6. PLATE OR ANGLE ASSEMBLIES NOT REQUIRED PROVIDED REMOVAL OF THE EXISTING COATING / CORROSION & SURFACE PREP DOES NOT YIELD UNEXPECTED RESULTS & REPAIRS CANNOT BE INSTALLED AS NOTED.
7. REMOVE & REINSTALL EXIST. WINDOW GLASS & FRAME TO REPAIR IF REQ'D.
8. THE W12 COL.'s INSTALLED w/ ADDITIONAL STEEL SECTION @ THE I/F OF THE W12 EXTR. FLANGE. RECORD DWG.'s REVIEWED COULD NOT CONFIRM THE SECTION. SITE VISIT REVIEW APPEARED TO INDICATE (2) L6x3 SECTIONS INSTALLED w/ (1) L6x3 EACH SIDE OF THE WEB. FIELD VERIFY AS REQ.'D & NOT SHOWN ELEVATIONS FOR CLARITY. REFERENCE DETAIL 5-S1.11 FOR CLARITY.

NOTES CTD. ...

9. " (X) " SYMBOL ON DRAWING INDICATES MARK NO. FOR BASE PLATE REPAIRS. REFERENCE DRAWING S-1.09 "KEY NOTES - COLUMN BASE PLATE REPAIRS" AND APPLICABLE SECTIONS & DETAILS AS REQUIRED.
10. REFERENCE DWG. S0.00 FOR ADDITIONAL GENERAL NOTES, MATERIAL SPECIFICATIONS & REQUIREMENTS, DESIGN CRITERIA AND LEGEND.

ESTIMATED BILL OF MATERIALS ... S1.13

ITEM #	COMPONENT	DESCRIPTION	QTY.	NOTES
01	BENT PLATE	0'-6$\frac{5}{8}$"x6$\frac{5}{8}$"x$\frac{3}{8}$" x 3$\frac{1}{4}$"	4	
02	BENT PLATE	0'-9"x4"x$\frac{1}{2}$" x 4$\frac{1}{2}$"	2	
03	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	50"	
04	FILLET WELD	$\frac{3}{16}$" EFF. THROAT	135"	
05	FLARE BEVEL WELD	PARTIAL PEN.	20"	

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STRUCTURAL

EXIST. BLDG. A TRUSS CONDITIONS & REPAIRS (SHT. 11 OF 11)

PROJ. START DATE:	2021.NOV
MCE PROJ. #	00992-0261
DRAWN	WFB
DESIGNED	WFB
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SCALE
HORIZONTAL: AS NOTED
VERTICAL: NA

S1.13
DRAWING NUMBER
C
REVISION

STATUS: **FINAL DESIGN SUBMITTAL RELEASED FOR BID**

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Appendix #4

EMERALD ENGINEERING INC.

9942 Currie Davis Dr., Ste. H
Tampa, FL 33619
813.995.0300
emeraldmep.com
FL EB # 0027845

LONG CENTER NATATORIUM
1501 N BELCHER RD, CLEARWATER, FL 33765

HVAC DESIGN REPORT

DECEMBER 12, 2023

1.0 Purpose

The existing Long Center Natatorium is in need of a renovation. The existing HVAC systems have surpassed their life span and are not operating properly. Recurring condensation on the interior of the glass walls is corroding the exterior wall steel frame structure. The Owner, the City of Clearwater, is considering two renovation options:

Option 1: Remove the existing window glass, rehab the existing steel frame structure, build a new thermally-broke glass curtain wall structure on the exterior side of the existing steel frame, and provide all new HVAC systems.

Option 2: Remove the existing window glass, rehab the existing steel frame structure, build new solid exterior walls with reduced glass area on the exterior side of the existing steel frame, and provide all new HVAC systems.

Emerald Engineering, Inc. has been commissioned by Wannemacher Jensen Architects, Inc. to provide a preliminary HVAC design and run an energy model for both options. This information will then be used in a life cycle cost analysis to determine which option is the most economical over the anticipated life span of the building.

This report documents our analysis and findings.

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2.0 Option 1 HVAC Design

Below is a brief rendering of the architectural design for Option 1. Please refer to Wannemacher Jensen Architect's reports and drawings for more information. We understand the new glass curtain wall structure will be completely thermally-broke from the existing steel structure, so that the outside temperature will not transfer to the inside steel and cause condensation (and eventually corrosion of the steel). The new glass values are Winter U-Value 0.24, Summer U-value 0.20, and Solar Heat Gain Coefficient 0.22.

The following are our HVAC design considerations:

- Large pool is kept at 80 degrees F
- Small pool is kept at 90 degrees F
- Interior design temperature of 82 degrees F (two degrees above large pool temperature)
- Interior design humidity of 55% RH
- Provide a minimum of 6 air changes per hour (ACH)
- 400 people in the pool area
- Additional 100 people in the spectator area

According to our HVAC load calculations, Option 1 will require two roof mounted de-humidifiers (approximately 70 tons each, 35,000 CFM of supply air each, and 19,000 CFM of outside air each) and two supply fan recirculating units (20,000 CFM each). The supply fan units do not contain cooling or heating elements; they are only used to provide the additional recirculation of air to achieve 6 ACH.

Refer to **Appendix A** for cut sheets and schedules of these four HVAC systems.

EMERALD ENGINEERING INC.
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FL EB # 0027845

All four HVAC systems shall be mounted on the roof of the natatorium on a steel structure that is isolated to restrict transfer of vibration and noise from the units to the building. Main ductwork shall be roof mounted and drop down into the natatorium. Interior ductwork wrapping around the perimeter of the pool shall be exposed ductsox, to avoid corrosion.

Refer to **Appendix B** for a sketch of the HVAC system layout.

The equipment budget for the HVAC system is $1.3 million. This only includes the equipment and not installation, ductwork, piping, controls, etc.

3.0 Option 2 HVAC Design

Above is an architectural rendering of Option 2 provided by Wannemacher Jensen Architects. See their documentation for more information. The exterior glass area has been reduced.

We have modeled this Option 2 building in our HVAC load calculation software and determined that it will not reduce the HVAC equipment sizes from Option 1. The tonnage of the equipment is based largely on the pool's latent heat load (moisture removal load) and air exchanges. Both of those are the same in Option 1 and Option 2. A reduction of the exterior glass only reduces the sensible load (radiated heat load), and not by enough to reduce the overall tonnage of the equipment. The glass being specified has excellent insulation performance.

Therefore the HVAC systems for Option 2 match that of Option 1. Please refer to **Appendix A** for cut sheets and schedules of the four HVAC systems and **Appendix B** for a sketch of the HVAC system layout.

The equipment budget for the Option 2 HVAC systems is $1.3 million. This only includes the equipment and not installation, ductwork, piping, controls, etc.

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4.0 Energy Model Results

Separate energy models were completed for Option 1 and Option 2 using the same HVAC system, but different architectural building designs (the reduction in exterior glass). Refer to **Appendix C** for Option 1 and **Appendix D** for Option 2.

The comparison shows that the HVAC system in Option 2 used about 15% less energy than the HVAC system in Option 1 over the course of a year. This equates to about $20,000 per year in energy cost savings.

It should be noted that these energy models include many assumptions, such as a blended energy rate, operating hours, lighting load, occupancy, etc. They also do not include plug loads (such as receptacles, computers, etc.), pool equipment loads (pumps, pool lights, etc.), or any other portion of the building except for the natatorium. Therefore, these energy costs cannot be compared to current energy bills or be used to predict future energy bills. The energy models have been constructed solely to determine the difference in energy consumption due to the difference in glass areas between the two options.

Please feel free to call me if you have any questions.

Sincerely,

Michael Costello, PE
Director of Mechanical Division

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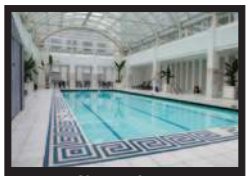
APPENDIX A

DH-1&2

SELECTAIRE PLUS™ by Desert Aire

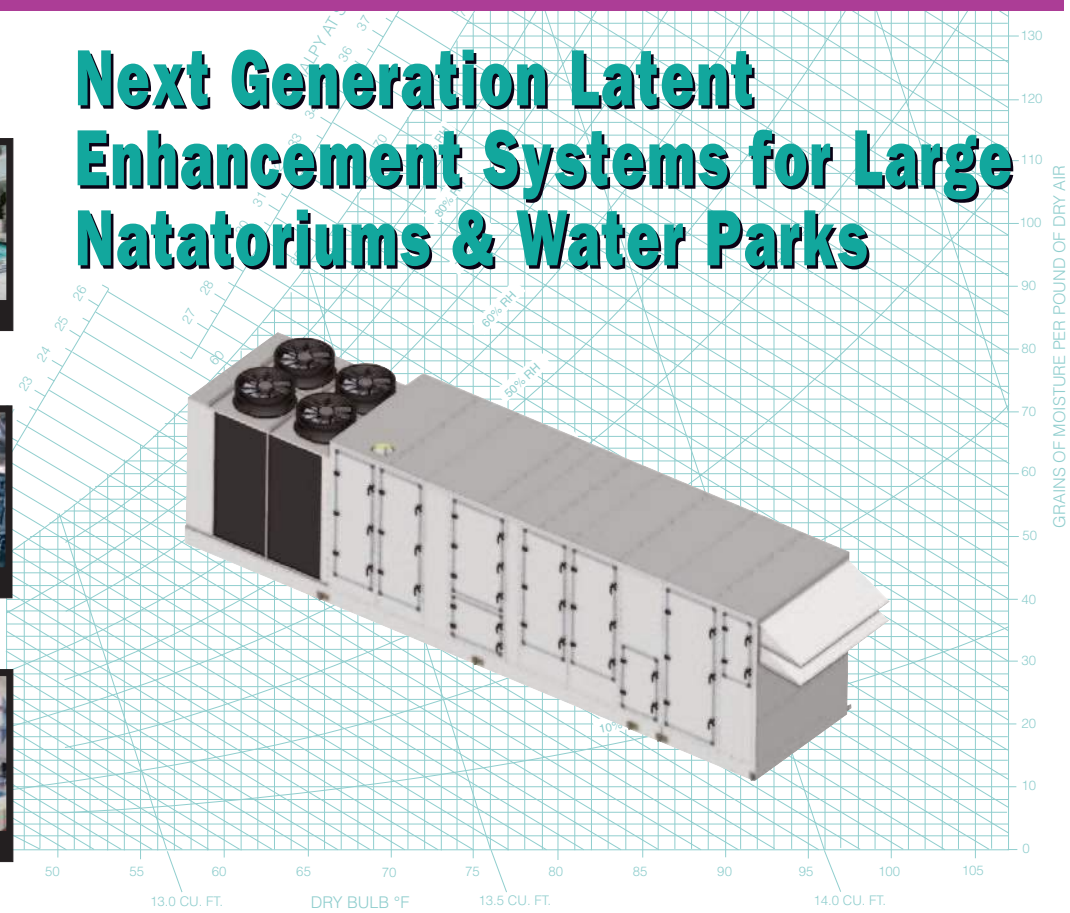
SELECTAIRE PLUS™ SERIES DEHUMIDIFIERS

Next Generation Latent Enhancement Systems for Large Natatoriums & Water Parks


Natatoriums

Water Parks

School Aquatic Facilities



Desert Aire's patent pending SelectAire Plus™ (SP Series) dehumidification systems offer you complete humidity control solutions for large indoor pool applications and water parks. Building on our years of design, manufacture and applications expertise of natatorium-specific equipment, Desert Aire developed the SelectAire Plus™ Series to provide industry leading performance, efficiency and value. The SelectAire Plus™ Series incorporates the original SelectAire™ System energy recovery technology and adds features for applications that require the superior cabinetry, state-of-the-art fan design and next-generation control features for enhanced setup and serviceability. Best of all, an industry exclusive wrap-around heat pipe enhances the moisture removal capacity and efficiency of SelectAire Plus™ Series dehumidifiers, getting more work out of less energy throughout the year.

MAJOR FEATURES AND BENEFITS

- Unique dual circuit design with enhanced dehumidification section and a separate enhanced cooling and energy recovery section is an industry-leading exclusive
- SelectAire Energy Recovery recovers more exhaust air energy than any other technology
- Automated control of ventilation air and exhaust air protects the occupants and the building
- Direct Expansion Technology with scroll compressors provides more dehumidification and higher energy efficiency than units with secondary glycol loops
- New optional air-cooled packaged and integrated gas heating solutions simplify installations
- Backward inclined airfoil plenum fans for both supply and exhaust are matched to the specific airflow and static pressure requested for the highest efficiency. All fans include electronically commutated (EC) motors or AC motors with variable speed drives in a fan-wall configuration

OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY

Est. 1978 DESERT AIRE

- 2" double-wall injected foam cabinet with hinged access doors ensure sealing even against high static pressure and provides excellent serviceability
- Single piece designs for large units and sectioned system options make installation simple – indoors or out

Enhanced Latent Design

SelectAire Plus™ Series uses a unique dual-circuit design to maximize the dehumidification capacity. A wrap-around heat pipe on one of the circuits enhances the moisture removal capabilities of the evaporator coil. The nature of the wrap-around heat pipe also tempers the air as it leaves the coil. This provides a more neutral leaving air condition and minimizes temperature fluctuations and drafts in the poolroom.

When warm air passes over the heat pipe assembly, the refrigerant within the heat pipe vaporizes, carrying heat to the second section of heat pipe assembly placed downstream. Because some heat has been removed from the air before encountering the evaporator coil, the incoming air stream section is called the pre-cool heat pipe.

Air entering the evaporator coil is assisted to a lower temperature, therefore coming closer to saturation and resulting in greater condensate removal by the coil. The "over-cooled" air is then reheated to a desirable temperature by the reheat heat pipe section, using the heat transferred from the pre-cool heat pipe. This entire process of pre-cool and reheat is accomplished with very little additional energy use.

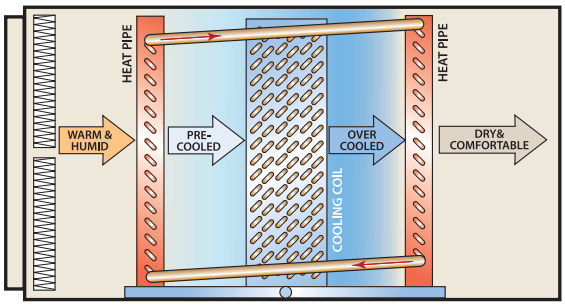


Figure 1 - SelectAire Plus™ Series unique enhanced latent design with heat pipe assembly

The improved efficiency of this section is extremely important since most pools are inactive for a majority of their operating hours. This means only half of the capacity of the dehumidifier needs to be used. In addition cold, dry winter air also reduces the moisture loads of occupied active pools during much of the year. Thus a dehumidifier that maximizes its moisture removal efficiency for the majority of operating hours will yield the lowest operating cost system. This circuit on the SelectAire Plus™ Series will be approximately 25% more efficient than a conventional natatorium dehumidifier without this technology.

Cooling and Energy Recovery

In addition to the enhanced moisture removal circuit, the SelectAire Plus™ Series features a second circuit optimized for cooling the air and recovering energy from the exhaust air. This circuit has a higher velocity over the cooling coil than the dehumidification enhanced circuit.

When there is a call for cooling only or a call for more cooling than the dehumidification-enhanced circuit is providing while operational, the cooling circuit is enabled. The operation of the circuit is further enhanced through the use of refrigeration suction pressure controls and airflow monitoring. As moisture load is reduced in the space, airflow is increased even further until the space is cooled to the setpoint. When cooling is enabled the heat absorbed when cooling the air is rejected to the pool water circuit or an auxiliary heat sink such as a condenser located outdoors.

Even the relative capacity of the individual circuits has been thoughtfully designed. Extensive field research has shown that the vast majority of poolrooms require more total dehumidification capacity than sensible cooling capacity. SelectAire Plus™ Series circuit sizes have been specifically developed to ensure that the sensible cooling load on a design day is addressed, yet efficiency is extremely high.

When heating is required the SelectAire Plus™ System shifts dampers to reroute the air through this sensible cooling coil before exhausting it. The refrigeration system also re-routes the hot gas from the compressor so that it is rejected into the supply air. In this way, a significant amount of energy is recovered from the exhaust air. Desert Aire's use of this "heat-pump" technique has no equal in the industry. Where other passive-type recovery devices including run-around glycol loops and exhaust air heat pipes have significantly reduced capacity at part-load heating conditions, the SelectAire Plus™ System has a constant capacity. This system also recovers much more heat as the energy in the exhaust air, in the form of moisture, is converted to pure air heat energy.

Integrated and Automated Ventilation and Exhaust Air

Ventilation air is critical for occupant comfort and safety. Also, maintaining negative static pressure relative to outdoors and adjacent spaces is a critical issue for the longevity of the structure. The standard outdoor air and exhaust air in the SelectAire Plus™ System has self balancing and monitoring capability. The design of the SelectAire Plus™ System helps to automate setup by directly monitoring the outdoor airflow rate and poolroom static pressure. Up to five modes of outdoor airflow rates can be programmed and controlled: Unoccupied; Occupied; Event; Alarm; and, Purge. The static pressure in the space is automatically controlled when modes are switched.

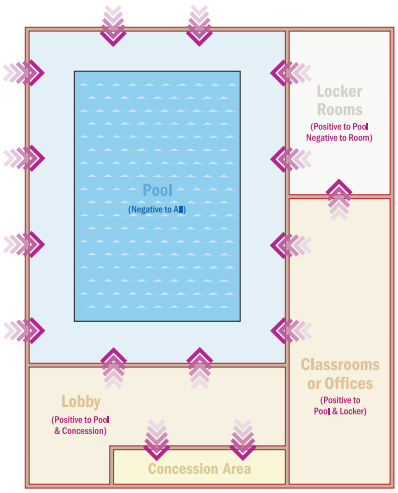


Figure 2 - Negative static pressure in the poolroom

Static pressure, outdoor airflow and exhaust flow are directly read by personnel at the user interface. This helps to ensure that setup is done properly and with minimal effort.

Fans

The SelectAire Plus™ fans are custom designed for the application. Automated selection software evaluates available fan and motor systems for each application to optimize cost and efficiency. All fans modulate and are automatically controlled to ensure that correct flow rates are maintained through each component, regardless of filter loading or mode changes.

All fans include high-performance backwards-inclined airfoil blades. Electronically commutated (EC) external-rotor motors or direct drive NEMA Premium efficient motors with variable speed drives are used in a fan-wall configuration.

Cabinet

The cabinet is constructed of a 2" double wall panel with superior insulating properties and fabricated to withstand pool room corrosive environments. Exterior panels are galvannealed steel with powder coating and G90 galvanized with architectural paint treatment. Interior cabinet panels are G90 galvanized steel.

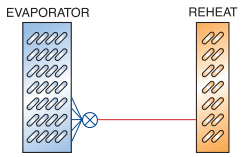
The cabinet has double-bypass seals on all doors for superior weather resistance and tight sealing against high static pressures. Service doors are located at all regular maintenance and inspection points. Major mechanical components are located out of the airstream for accessibility. This also ensures that any high humidity or corrosive indoor air does not affect operation or longevity.

Indoor units contain a mechanical section for major components that is outside of the airstream. Lights and service outlet for this area are standard and can be powered by a 120 VAC 15A circuit supplied by the field.

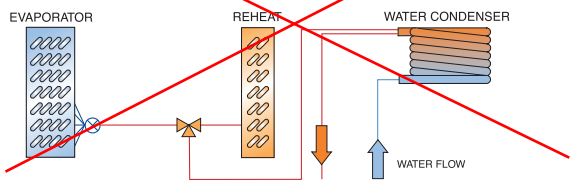
Operation

Desert Aire's indoor pool dehumidifier systems are flexible in their design options. This modular concept allows each system to be customized for specific dehumidification applications. Each module type is described below.

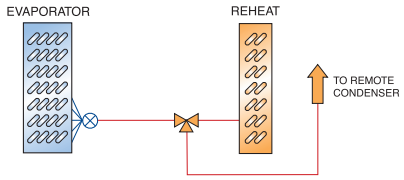
REHEAT ONLY ... This is the basic option which removes moisture from the air at the evaporator coil and reheats it before returning to the space as dehumidified air.



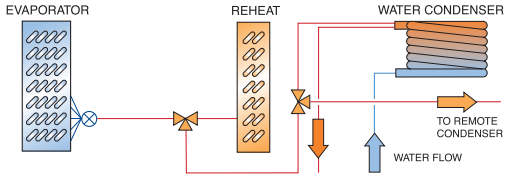
REHEAT & WATER ... In addition to the reheat coil, a water-condensing coil is added to the refrigeration circuit. Either condenser can become the primary heat sink allowing the circuit's latent and sensible heat to be directed to a water source or returned to the air.



REHEAT & AIR REMOTE CONDENSER READY... This option offers a reheat coil and an air cooled remote condenser connection.



REHEAT & WATER & AIR COOLED REMOTE CONDENSER READY... This is the combination of all heat sink options. The combination is used when only a partial water heatsink is available but full capacity dehumidification is required continuously, regardless of season. This is typical for large natatoriums and water parks.



Controls & Modes of Operation

Each circuit is controlled by the integral microprocessor based controller. This control system includes an easy-to read user interface. A Remote Display Terminal (RDT) may be ordered separately for remote mounting. The use of basic control and staging sequences provides great flexibility in optimizing dehumidification and energy recovery capacity. The system features control of all dehumidification functions including auxiliary heating, occupancy schedules and ventilation air. The control system also provides diagnostic readouts and alarms. Optional communication cards are offered that allow the system controller to be connected to a building automation system. Communication is offered for BACnet™ MS/TP, BACnet™ Ethernet™, LonWorks® and Modbus®.

The system automatically controls the selection of the compressor set that should be operational. This depends on the internal loads such as humidity and temperature. With completely separate exhaust and ventilation air streams, the SelectAire Plus™ Series and its integrated dampers will provide the correct solution to the ever changing demands of natatorium internal space conditions.

In the dehumidification mode the system will capture the high energy content of the exhaust air and return this energy back to the air or pool water at an industry-leading coefficient of performance (COP) approaching 5. This helps to minimize the amount of new energy required to make up the ventilation load's heating requirement.

Dehumidification in Energy Recovery Mode

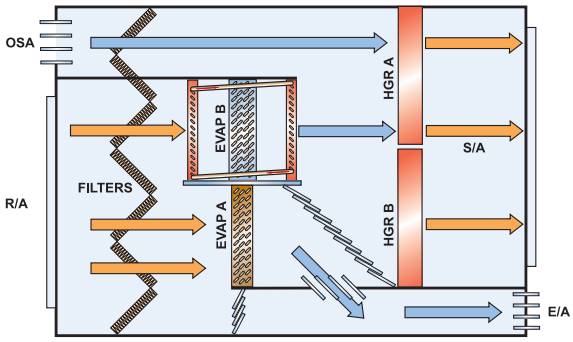


Figure 3 - Dehumidification in Energy Recovery Mode

Many conventional dehumidifiers exhaust the air after the evaporator coil for construction convenience. The SelectAire Plus ™ System strategically configures its airflow arrangement to "Select" where the exhaust air is coming from. In the cooling mode the higher enthalpy return air is exhausted before the evaporator coil thus maintaining all of the cooling performed by the evaporator and delivering this cool air to the space. In the heating mode the energy of the high enthalpy containing return air is recovered by the evaporator coil and the cool air is exhausted after the coil. Refer to Desert Aire's Technical Bulletin 6 – SelectAire Heat Recovery System, for more details.

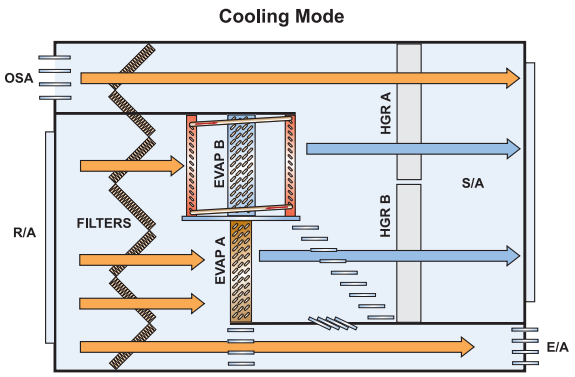


Figure 4 - Dehumidification in Cooling Mode

Standard SP Series Refrigeration Design Features

- Dual, independent refrigeration circuits operate independently or simultaneously
- Heavy-duty scroll compressors located in a separate vestibule
- Maximum of 38" coil height maximizes moisture removal
- Sloped, stainless steel drain pan for each circuit
- Minimum of 8" separation between evaporator and condenser coils prevents re-evaporation
- One circuit is designed for maximized latent removal using a wrap-around heat pipe
- One circuit is designed for sensible cooling and energy recovery
  R-410A refrigerant

Cabinet and Construction

- Base rails and supports constructed of 12-gauge galvanized steel channels
- Interior is constructed of G90 galvanized steel

Blower

- Backward-inclined airfoil plenum fans
- Electronically commutated (EC) or direct drive motors
- All fans arranged in a fan array

Filters

- Return Air: 4" MERV 8, pleated filters
- Outdoor Air: 4" MERV 8, pleated filters

Electrical Service

- Hinged electrical panel with separate sections for high and low voltage components
- Single point power connection for all units

Controls

- Duct or wall mount temperature and humidity sensors
- Integrated Display with an optional remote display terminal
- BAS communication options
- Built in time clock for standalone operation
- Alarm Retention

Coil Coating

- Coil ElectroFin E-Coat to resist chemicals and corrosion

Auxiliary heat Options

- Hot water coil supplied downstream from hot gas reheat coil
- Steam coil supplied downstream from hot gas reheat coil
- Electric SCR heat supplied downstream from hot gas reheat coil
- Gas heater supplied downstream of blowers
- Control outputs for field supplied auxiliary heating devices

Installation location

- Indoor
- Outdoor
- Rooftop

Condenser (Choose per circuit)

(All circuits reject the full THR - Total Heat of Rejection)

- Packaged air-cooled condenser (outdoor units only)
- Split air-cooled remote condenser
- Water condenser for water loops or fluid cooler

Pool Water Heat

- Coaxial heat exchanger for recovery of heat to pool water

Warranty

- 2-year parts warranty
- ElectroFin Coated coils include 5-year parts warranty

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ELECTRIC HEAT

OPTIONAL AUXILIARY ELECTRIC HEATING OPTIONS

Desert Aire provides auxiliary electric heating options for the SelectAire Plus™ Series that are sized to meet the winter heating requirements of the outside air.

These heating elements are utilized when the air temperature in the zone drops below the customer set point.

Desert Aire sizes the heating elements to precisely match the load requirement of the system. The heaters are automatically controlled by the units microprocessor to maintain zone temperature. An SCR controller is used for the electric heat option to vary the heat output.

Design Specifications

The following list highlights the noteworthy features of the SelectAire Plus™ Series electric heaters:

- System Single Point Power to Dehumidifier
- NiCr 60 Corrosion-Resistant Element
- Welded Construction Using 20 MSG Galvanized Steel
- Automatic Reset High Temperature Limit Safety Switch
- Manual Reset High Maximum Temperature Limit Safety Switch
- Air Flow Pressure Switch
- Fusing as Required for Each 48 Amp Circuit
- Fused Circuits per N.E.C., UL, and CSA
- SCR modulation

Figure 1 - Detail of Electric Heating Element for SelectAire Plus™ Series Unit

HOT WATER HEAT

OPTIONAL HOT WATER HEATING OPTIONS

Desert Aire provides auxiliary heating options for its SelectAire Plus™ Series product line that are sized to meet the winter heating requirements of the space.

These heating elements are utilized when the air temperature in the zone drops below the customer set point. Desert Aire sizes the heating elements to precisely match the load requirement of the system. The heaters are automatically controlled by the unit's microprocessor to maintain an exact leaving air temperature. A customer supplied hot water control valve is modulated from the controller with a 0 to 10 VDC direct acting signal. Please refer to figure 1 for a typical installation.

HWC Design Inputs

The coil is selected for each customer's particular application based on the following criteria:

- **Entering water temperature (EWT), typically between 140° F and 180° F**
- **Leaving water temperature (LWT), typically 20 degrees less than the EWT**
- **Customer specified capacity required (MBH)**
- **Entering air temperature (EAT), (the mix temperature of outdoor air at winter design with return air)**
- **Specify fluid pressure drop maximum**
- **Type and concentration of glycol used, if applicable**

For freeze protection Desert Aire uses a capillary type temperature sensor which is attached across the downstream face of the coil. Freezestat is set at 38 deg F with an auto reset switch. If engaged the unit controls would respond by closing the outdoor air damper, wait 5 minutes and if not reset, de-energize the fan, open the hot water coil valve 100%, and log the alarm on the controller.

To size the control valve, please provide a qualified vendor the water temperature, flow rate (gpm) and the requirement for a 0 to 10VDC signal and they will select the appropriate valve to purchase.

Desert Aire offers HW valve/actuators as an option. Please consult with your Desert Aire sales representative if you wish for Desert Aire to supply this component.

Optional ElectroFin coil coating for pool environments is available.

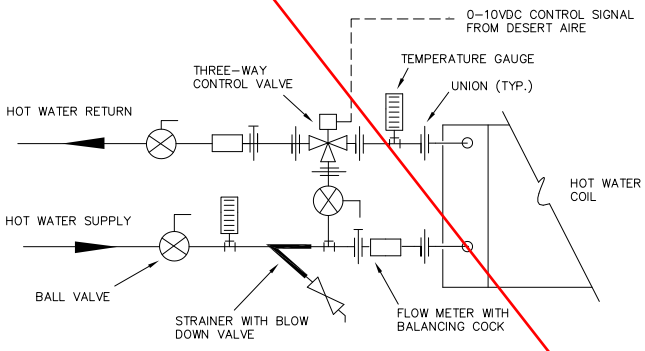

Figure 1 - Hot Water Piping Detail

CORROSION RESISTANT COILS

ElectroFin® E-coat Coil Coating

Desert Aire has partnered with Luvata ElectorFin for its coil coating because of its superior performance in eliminating corrosion and fin deterioration in the pool and coastal climate applications. ElectroFin® E-coat is a water-based, flexible epoxy polymer coating process engineered specifically for HVAC/R heat transfer coils. ElectroFin® uses a PPG POWERCRON® e-coat formulation specifically designed to provide excellent edge coverage of fins with a unique polymer that controls the flow characteristics of the coating.

Benefits of ElectroFin's factory-applied electrocoating process:

- The only process that can guarantee 100% coil coverage without bridging, including enhanced fin designs
- Excellent corrosion and UV resistance make it suitable for pool room and coastal environments

Electrocoating is the process by which a metallic work piece (coil) is submerged in a paint / water bath where electricity is used to deposit paint onto it.

Figure 1 - ElectroFin® E-coat Process

Corrosion Resistance

In the electrocoating process, the coil assembly acts in the same way as a magnet. The coating molecules are electrically attracted to the metallic coil surfaces, meaning the entire coil is completely and uniformly coated. When we mention the entire coil we are talking about the coil fins, end plates, copper tubing and copper return bends. In other words, the coating covers the entire coil assembly. The result is a finish which provides excellent resistance to pool chemical, coastal marine (salt-air), industrial and urban environments. When properly maintained, you can expect ElectroFin® e-coated coils to provide protection for years. Desert Aire provides a 5-year coil parts warranty as evidence of its superior protection.

Resistance to UV Degradation

When coils are to be subjected to ultraviolet exposure such as the remote condenser, they receive a spray-applied, UV-resistant urethane mastic topcoat. As a result, UV degradation of the epoxy e-coat polymer molecules is eliminated and the film integrity is maintained. This is offered as an option for our RC Series condensers.

Proven Effective

The electro-deposition process is the most automatic, controllable, and efficient method for applying a corrosion inhibiting coating to a metallic work piece. The process dictates that all metal surfaces are coated in an even, uniform finish. All coil surfaces reach an average e-coat dry film thickness of 1 mil (0.001”). It meets the 5B rating cross-hatch adhesion per ASTM B3359-93. Corrosion durability is confirmed through testing to no less than 5,000 hours salt spray resistance per ASTM B117-90 using scribed aluminum test coupons.

Comparison to Fin Stock Coatings

Not all coil coatings are the same. Many dehumidifier companies use a fin stock coating that is applied to the aluminum stock before the coil is manufactured. This means the edges of the fin, the copper tubes and the steel header remain uncoated.

Figure 2 - Photo of a coated coil

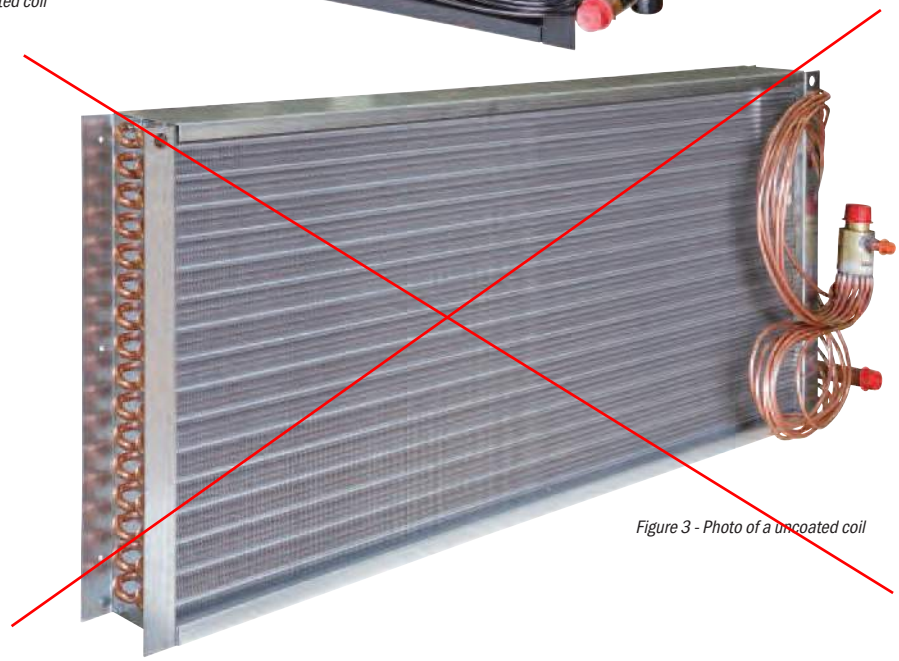

Figure 3 - Photo of a uncoated coil

CORROSION RESISTANT COILS

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Auxiliary Gas Heating Option

Optional Gas Heating Module

Desert Aire provides auxiliary heating options for its SelectAire Plus™ Series product line that are available in several capacities to meet the winter specified heating requirements of the space.

These heating elements are utilized when the air temperature in the space drops below the customer set point. Desert Aire sizes the heating elements to precisely match the load requirement of the system. The heaters are automatically controlled by the unit's microprocessor to maintain an exact leaving air temperature. Desert Aire controls the heater output with a 0-10VDC control signal from the dehumidifier's operating controller.

Desert Aire combines different burner sizes to precisely match the load of the system. This may be in a single heater module or in multiple modules. A modulating gas valve is automatically controlled by the unit's microprocessor to maintain an exact leaving air temperature. If multiple burner sets are utilized, then a venier sequence is used where the base burner is modulated and the others are staged. The system's overall turn down ratio is a function of the number of heating modules and is summarized in the table below:

Input Capacity (MBH)	Output Capacity (MBH)	Gas Module Qty.	Effective Turndown Ratio	Gas Connection
800	640	2	10 to 1	One 2" NPT
1,000	800	2	10 to 1	One 2" NPT
1,200	960	2	10 to 1	One 2" NPT
1,600	1,280	4	20 to 1	Two 2" NPT
2,000	1,600	4	20 to 1	Two 2" NPT
2,400	1,920	4	20 to 1	Two 2" NPT

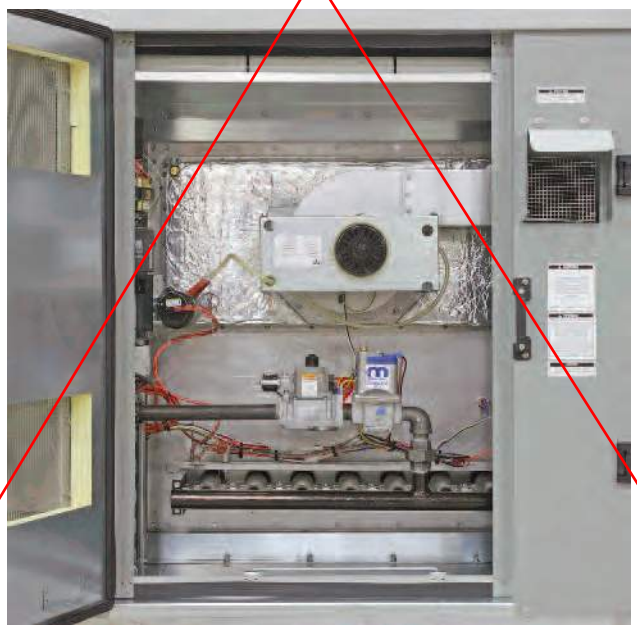

Figure 1 - Detail of Gas Heat Compartment on SelectAire Plus™ Series Unit

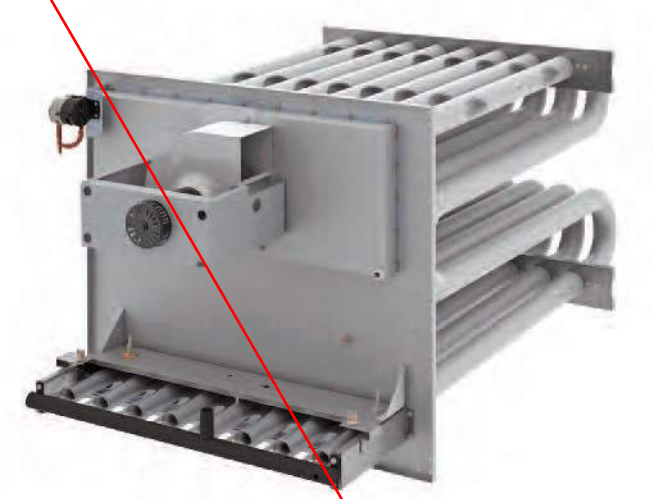

Figure 2 - Detail of Gas Heat Burner Assembly

The gas module shall provide a minimum combustion efficiency of 80%, and listed for operation downstream of refrigeration or cooling system, and provide means for removal of condensate that occurs in the heat exchanger during cooling operation. They are listed for outdoor installation without the need for additional power ventilation.

Heat exchanger shall be tubular in design and constructed of Type 304L stainless steel and employ (integral formed dimple restrictors, formed turbulators) and provide for an unobstructed drainage path for condensate and provide a positive pitch to promote drainage.

Additionally the gas module shall employ:

- Patented inshot gas burners, with integral carryovers, capable of operation at 5:1 turndown with modulating controls
- A combustion blower to provide for positive venting of flue gases
- Pressure switch to prove air supply for combustion
- Direct spark ignition of gas burners with remote flame sensor to prove carryover across all burners
- An automatic reset type high limit switch to limit maximum outlet air temperature to less than 250° F
- Manual reset flame rollout switch
- Listed Combination Gas Valve incorporating redundant safety shut-off valve, manual shut-off , and gas regulator which regulates gas pressure to burner supply manifold.
- Direct Spark ignition control design certified by a Recognized National Testing Laboratory and incorporating a LED diagnostic light and alarm capable contact

The completed heater assembly shall be factory fire tested prior to shipment.

SELECT AIRE™ PLUS by Desert Aire

SMART INTEGRATION OF EXHAUST AIR

CHLORAMINE SENSOR

Exhaust Air Integration - Duct Mount

Desert Aire's SelectAire Plus™ natatorium dehumidifier can vary the volume of outside air and exhaust air based on the level of contaminants within the pool room. The key to this integration is the use of a Volatile Organic Compounds (VOC) sensing element that can detect when interior levels of chemicals are present such as chloramines. This provides a similar methodology as the use of CO_2 sensors in general ventilation applications for the pool environment. Now there is the ability to optimize the volume of exhaust air required with the energy cost of doing so and insure a suitable pool environment for the occupants.

The VOC duct sensor samples duct air using an aspiration tube. Moving air from the duct enters the tube, is forced into the enclosure and exits through the other half of the tube. As long as there is air movement in the duct, air is continuously exchanged.

Figure 1 - Duct Mounted VOC Sensor

Sensor Specifications

Power: 15 to 35 VDC @ 50 mA
Power Sensing Element: VOCs: Micro-machined Metal Oxide Quick Response Sensor through Aspiration Tube

Analog Outputs: 0 to 10VDC, (>10KΩ impedance)
VOC Contaminants: 0 to 2,000 PPM CO_2 Equivalent
VOC Detection Range: 0 to 100%
Response Time: Less Than 60 Seconds
Start-Up Time: 15 minutes
Operating Environment: 32 to 122°F (0 to 50°C)
0 to 95%RH non-condensing
Dimension: 4.91"H x 3.21"W x 1.20"D
(124.6 x 81.5 x 30.5 mm)
Enclosure Rating: NEMA 4
Enclosure Material: Polycarbonate, UL94 V-O
VOC Duct Sensor
Certifications: RoHS
Warranty Period: Two years from manufacture date

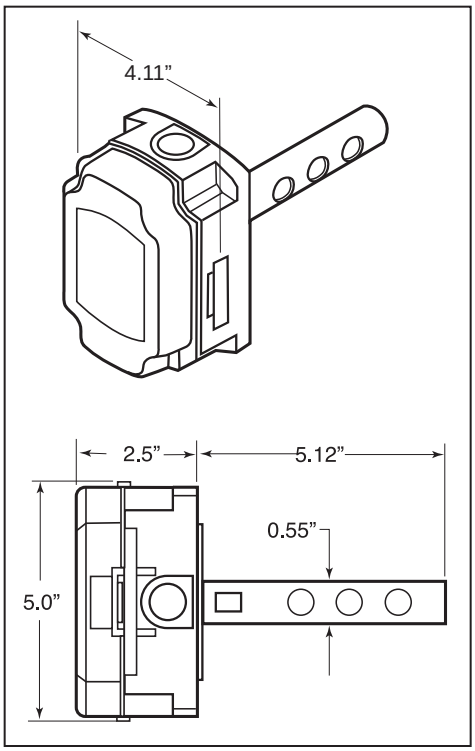

Figure 2 - Duct Sensor Dimensions

Providing Peace of Mind to Your Pool Room

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SELECT AIRE™ —PLUS— by Desert Aire

SMART INTEGRATION OF EXHAUST AIR

CHLORAMINE SENSOR

Exhaust Air Integration - Wall Mount

Desert Aire's SelectAire Plus™ natatorium dehumidifier can vary the volume of outside air and exhaust air based on the level of contaminants within the pool room. The key to this integration is the use of a Volatile Organic Compounds (VOC) sensing element that can detect when interior levels of chemicals are present such as chloramines. This provides a similar methodology as the use of CO_2 sensors in general ventilation applications for the pool environment. Now there is the ability to optimize the volume of exhaust air required with the energy cost of doing so and insure a suitable pool environment for the occupants.

Figure 1 - Wall Mounted VOC Sensor

Sensor Specifications

Power: 15 to 35 VDC @ 50 mA
Power Sensing Element: VOCs: Micro-machined Metal Oxide

Analog Outputs: 0 to 10VDC, (>10KΩ impedance)
VOC Contaminants: 0 to 2,000 PPM CO_2 Equivalent
VOC Detection Range: 0 to 100%
Response Time: Less Than 2 Minutes
Start-Up Time: 15 minutes
Operating Environment: 32 to 122°F (0 to 50°C)
0 to 95%RH non-condensing
Dimension: 4.50"H x 2.86"W x 1.06"D
(114.3 x 72.7 x 26.9 mm)
Enclosure Material: ABS Plastic, UL94 V-0
Certifications: RoHS
Warranty Period: Two years from manufacture date

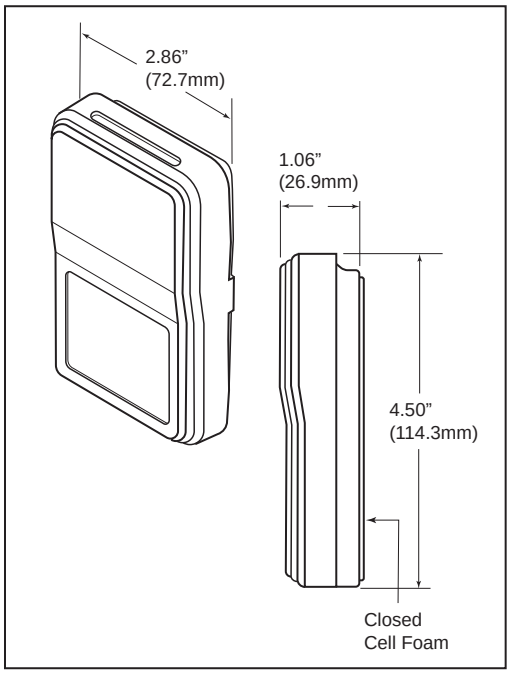

Figure 2 - Wall Sensor Dimensions

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CM3560 Series Controller for SP Dehumidifiers

ADVANCED COMMUNICATIONS CAPABILITIES EASY INSTALLATION AND OPERATION CONTINUOUS MONITORING

Advanced SelectAire Plus™ Microprocessor Controller

CM3560 Controller Used on SP Series Dehumidifiers

Integral Return Temperature & Humidity Sensor

Wall Mount Temperature & Humidity Sensor

FEATURES

- *Standard integral return air sensor for control*
- *Optional wall mounted sensor*
- *LCD interface terminal in control panel*
- *Optional remote display terminal (RDT)*
- *Built-in cloud based remote monitoring*

CM3560 Series Optional Remote Display Terminal (RDT)

DESCRIPTION

The CM3560 controllers are uniquely programmed for each Desert Aire application providing energy efficient moisture removal and precise temperature & humidity control.

The CM3560 controller offers an easy interface with building management systems (BMS) with on-board or pre-configured gateway modules. Modbus RTU and TCP/IP are standard. BACnet® MS/TP and BACnet® Ethernet are onboard and can be activated with optional licences. A LonTalk gateway is available that can connect a LonWorks system to the controls.

A user interface to the CM3560 is supplied on each unit. This backlit LCD display provides easy to navigate screens for setpoint adjustment and unit monitoring. The optional remote display terminal can be connected to the controller and mounted at a more convenient location for user interface.

ORDERING CODE

Accessories

- ☐ CA3560-WALL - Optional Wall Mount Sensor
- ☐ CA3560-OD - Optional Remote Display Terminal

All trademarks hereby referenced are the property of their respective owners.

SYSTEM DISPLAY OPTIONS

The CM3560 controller is matched to SelectAire Plus™ Series systems based on the number of inputs and outputs; and by taking into account the accessibility of the controller and its user interface.

The SelectAire Plus™ Series uses the CM3560 controller with an integrated local display. The controller with local display is installed in the system electrical enclosure. All Inputs and Outputs along with alarm history can be viewed from the user interface to aid in unit or system diagnostics. When an integrated display and remote display terminal are connected to a controller, both display devices are fully functional.

BMS COMMUNICATION

LonWorks®- Echelon's LonWorks® is a solution of control in industry, offices, homes and transport. The electric standard supported is FTT10. The SP dehumidifiers need to be configured with a gateway at the time of order for LonWorks® communication.

Modbus®- One of the most widely used protocols. The system supports Modbus Slave, RTU mode; communications standard RS485 without licenses or activation. Additionally supports Modbus TCP/IP as standard.

BACnet® MS/TP and BACnet® Ethernet- Based on EIA-485 and Ethernet standards. Ports are available for both BACnet MSTP and Ethernet as standard equipment, but licenses are required to be purchased at the time of order. Connection is possible through the following networks:

- SNMP v1, v2, v3 networks
- BACnet®, Ethernet, BACnet®/IP networks, BACnet® MS/TP
- LAN or Internet

BMS COMMUNICATION - DETAILS

BACnet® MS/TP

If the system was purchased with the BACnet MS/TP option, the BACnet Device Instance and Station Address will need to be set before connection to the control network. This is because the Station Address is set to 0 as a default, and will conflict with any device on the control network already set to 0.

Defining the station address prior to system shipment will allow Desert Aire to correctly set the address. If the value is not known prior to shipment, then the contractor must alter these default settings during system commissioning. A software utility program will need to be used, allowing access to these settings. For more information, refer to the controller manual shipped with the dehumidifier. Download the system BACnet Point List from the Desert Aire website (www.desert-aire.com).

BACnet® Ethernet

If the system was purchased with the BACnet® Ethernet option, the licenses have been activated in the controller and the Ethernet port can be used for connection to the BACnet network immediately. For the correct operation of the Ethernet network, a number of basic parameters need to be set, such as the IP address and Netmask. Each device connected to an Ethernet network must have a unique IP address.

The Ethernet port on the controller is set for DHCP. Therefore, in a network served by a DHCP server, the controller will automatically acquire the necessary parameters without requiring configuration. In the case of a network without DHCP, these parameters need to be configured manually. For more information, refer to the controller manual shipped with the dehumidifier. Download the SYSTEM BACnet Ethernet Point List from the Desert Aire website (www.desert-aire.com).

LonWorks®

If the system was purchased with the LonWorks option, the unit will contain a gateway that allows for communication to the LonWorks network. Documentation, including points list and connection information will be included with the dehumidifier.

Modbus®

If the Modbus network is to be used, the network address needs to be set in the controller for proper communication operation. If Modbus® RTU is used, a baud rate must also be specified.

Refer to the system controller manual for address and baud rate setting instructions. For more information, refer to the controller manual shipped with the dehumidifier. Download the Modbus® Point List from the Desert Aire website (www.desert-aire.com).

AireGuard™ Remote Monitoring Tool

The SP Series controller is equipped with an Ethernet connection to the internet. The owner must provide the Ethernet cable connection from their network router to the controller in order for data to transmit to a secure cloud storage location. A 2-year AireGuard™ subscription is included with systems shipped with this controller.

For those users with more than one dehumidifier, this configuration can act as their local building management system where all of the units are available with the same login credentials. All that is required is an Ethernet cable to be connected between your network router with internet access and the AireGuard™ interface located on the controller. The connection communicates without opening additional ports in the systems firewall or requiring a virtual private network.

Please refer to the AireGuard™ brochure for additional details.

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SEQUENCE OF OPERATION

Supply Blower Runs Continuously.

CIRCUIT HEAT SINK CONFIGURATION:
Compressor Starts On a Call for dehumidification and or cooling. The system has two configurable circuits as follows:
Circuit "A" Priority: Packaged Condenser

Circuit "B" Priority: Packaged Condenser

Dehumidification
First Stage: Circuit "A" starts and runs in respective order listed in the "Circuit Heat Sink Configuration Section".

Second Stage: Circuit "B" starts and runs in respective order listed in the "Circuit Heat Sink Configuration Section".

Cooling
First Stage: The exhaust damper before the evaporator coils opens. Circuit "A" will start and operate with the air reheat off reject its heat to following condenser(s), in respective order, listed in the "Circuit Heat Sink Configuration Section".

Second Stage: Circuit "B" will start and operate with the air reheat off reject its heat to following condenser(s), in respective order, listed in the "Circuit Heat Sink Configuration Section".

Air Heating
Occupied Times:

First Stage: The cold air exhaust damper (damper after evaporator) will open to maximize heating capacity. Circuit "A" will start and operate in the air reheat mode.

Second Stage: The auxiliary heater is activated by a 0-10 VDC control signal from the dehumidifier.

Unoccupied Times:

First Stage: The auxiliary heater is controlled by a 0-10VDC control signal from the dehumidifier.

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Pool Water Heating

Circuit A

An auxiliary pool/spa heater dry contactor will be closed, to activate the pool heater by others.

Circuit B

An auxiliary pool/spa heater dry contactor will be closed, to activate the pool heater by others.

Exhaust and Outside Air

The operation of the SelectAire Plus™ system's exhaust fan is to maintain the negative pressure of the poolroom by controlling the exhaust fan motor speed using inputs from the differential pressure transducer input signal.

The dehumidifier controls the flow rate of the outdoor air in each mode by measuring the pressure differential across the calibration plate in the intake section to vary the outside air damper. This provides a direct measure of outdoor air volume.

The system provides five individual settings for outdoor air flow rates that are field programmable:

- Unoccupied – Controlled via time clock
- Occupied – Controlled via time clock
- Event – Controlled via time clock
- Max OA – Controlled via VOC sensor set point
- Purge – Controlled via contact closure

EMERGENCY SYSTEM SHUTDOWN

Terminal points are available for a binary contact closure by others to control unit shutdown by smoke detector or other similar device. An open contact in the 24 VAC circuit will deactivate motors, fans and compressors.

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SelectAire Plus™ Dehumidifiers

DEHUMIDIFIER SPECIFICATIONS

Standard Unit Features

Enclosure:

- 2” double wall panel with injected polyurethane foam rated at R13.5
- Cabinet material
    - Exterior panels shall be galvannealed steel with powder coating or G90 galvanized with architectural paint treatment
    - Base rails and supports shall be 12-gauge G90 galvanized steel channels
- Hinged access doors shall allow easy access to internal components within each section
    - Doors shall be mounted with adjustable compression cam operated latches.
    - Double sealing bypass gaskets on frame and door
- The electrical control box and switch panel is enclosed in a separate compartment, complete with a hinged door

Exterior Paint and Finish:

- Powder coat technique
- High yield polyester paint
- Meets 1,000 hour salt spray test
- Beige color

Refrigerant: R-410A

Compressors:

- Heavy-duty scroll-type
- Equipped with high- and low- pressure safety devices
- Externally vibration isolated

Receiver:

- Sized for full-system refrigerant capacity up to 50’ line set
- Service ball valves included

Evaporator Dehumidifier Coils:

- Aluminum fins
- Copper tubes, hydraulically expanded
- One circuited with a wrap-around heat pipe for optimized moisture removal

Internal Air-Cooled Condenser (Reheat Coil):

- Aluminum fins
- Copper tubes, hydraulically expanded
- Coil is positioned with a minimum of 5” clearance from the DX coil to help prevent water re-evaporation

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Ventilation and Exhaust Air:

SelectAire Plus™ with Auto Balancing Control:
The unit will include the SelectAire Plus™ Energy Recovery Ventilation Air and Exhaust Assembly with up to 50% of the supply air volume for ventilation air. Exact amount of ventilation and exhaust air is as listed on the specification schedule.

The integral control system will maintain the correct proportions of return air, supply air, exhaust air and ventilation air. The system will monitor the static pressure difference at three locations; the ventilation air intake, evaporator coil and the zone vs ambient.

By monitoring the pressure differential across the ventilation air orifice plate, the unit controller will modulate the ventilation air damper to ensure the correct amount of ventilation air during occupied times. The amount of ventilation air can be set through the unit controller.

The system will monitor the pressure differential across the evaporator coil and will modulate the evaporator by-pass damper to ensure the proper amount of evaporator cfm; therefore, optimizing the moisture removal capacity of the system at all times.

The system will monitor the pressure difference between the zone pressure and the ambient pressure once the initial field air balance has been completed and setup values entered into the controller. This will vary the exhaust fan volume via the fan motor speed to help guarantee the negative pressure within the space.

The exhaust fan includes a velocity pressure measurement transducer that allows direct readout of the current exhaust fan flow rate and an adjustable maximum flow rate for each occupancy mode.

SelectAire Plus™ Recovery System:
The unit will be supplied with an integral fresh air/exhaust air heat recovery system for introduction of outside air, to comply with ASHRAE Ventilation Standards 62.1 and local health codes.

The exhaust air can be exhausted either before or after the evaporator coil, providing the ability to extract energy from the return air if heating is required. The control decision will be determined by the controls heating and cooling set points.

On a call for heating, it is desirable to extract as much heat as possible from the exhaust air. Energy is recovered from the exhaust air by first passing it through the circuit “A” evaporator coil in a cooling / heat pump operation. The cooled air is exhausted and the “Heat Pipe” energy plus the heat of rejection is returned to the air stream. The minimum COP of this operation is 4.0.

On a call for cooling, warm return air from the space is exhausted before the evaporator coil when it is desirable to remove as much heat as possible from the building. The refrigeration system serves to dehumidify and/or air condition the return air from the space.

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Exhaust will be provided with plenum fan(s) and motor(s) in direct drive arrangement on a frame independent of the unit base, properly sized for all exhaust modes listed in the unit schedule.

The ventilation air is brought in through the integral plenum and mixed with the bypass airstream. The air shall be filtered by 4” extended surface type filters with a minimum MERV 8 rating. A motorized, proportional control damper assembly shall be used.

The warm exhaust, cold exhaust, and ventilation air dampers each will be a motorized, proportional control type.

In addition, a motorized, proportional damper assembly will be included to bypass the evaporator coils to ensure proper face velocity and system efficiency in all occupancy modes of operation.

The controller will automatically adjust these dampers to maintain the specified flow rates (R/A, O/A and E/A) through the use of integral flow measurement devices.

The SelectAire Plus™ heat recovery system will use the “heat pump” principle to recover energy on a call for heating by operating one of the dual refrigeration circuits in conjunction with exhaust air.

The unit shall be supplied with an outdoor rain hood and bird screen.

Electrical Control Panel:

- Easily accessible on one side
- Single point power connection to serve controls, fans, electric auxiliary heater (if provided)
- Rated in compliance with NEC® 110.10 and UL 1995

Control System:

- A digital control system using a 16 bit microprocessor
- Three (3) levels of password protection
- Easy-to-read display which indicates actual operating and set points
- The display will be remote mountable up to 1,640 feet from the unit
- Built-in occupancy timer

Temperature Sensor:

- The unit includes a temperature sensor to be field installed on the wall

Relative Humidity Sensor:
The unit includes a relative humidity sensor to be field installed on the wall

Airflow Switch:

- The dehumidifier is equipped with an airflow switch to prevent the compressors from starting or operating on loss of airflow.

Refrigerant Pressure Transducers:

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- The dehumidifier shall have internal transducers for monitoring refrigerant pressures

Condensate Drain Pan:
- 20-gauge stainless steel, sloped, and positioned under the dehumidifier coil
- Fitted with a minimum 1” MPT non-corrosive plastic drain connection

Dampers and Damper Actuators:
Dampers controlling outdoor air or separating the exhaust air from recirculating air to be low leakage thermally insulated galvanized airfoil blade dampers blades and frame.

Control dampers for bypass air will be galvanized airfoil blades and frame. Linkage to consist of plated steel and axle with synthetic bearings.

All damper actuators will be proportional control connected to unit microprocessor and positions adjusted automatically based on sequence of operation. All fasteners, brackets and shaft clamps will be plated steel.

Supply Fan:
Supply fan will either be a plenum fan array with direct drive EC motors or a single plenum airfoil fan with VFD controlled motor.
- All bearings are selected for a minimum of a L50 Lifetime of 100,000 hours
- All fans shall be dynamically and statically balanced
- Blower Discharge: The unit’s air discharge will be as shown on the drawing

VFD Option: The fan housing shall be made of galvanized steel. The high performance impeller is manufactured in corrosion resistant steel, with backward curved, true airfoil shaped blades, welded into position. All wheels are coated with an anticorrosive primer and a final layer of synthetic paint. The driver pulley and the blower pulley will be made of cast iron. The motor sheave will be a variable pitch type to allow for field adjustment of CFM and external static. VFD controller located out of air stream to control motor's speed.

Exhaust Fan:
Exhaust fan will either be a plenum fan array with direct drive EC motors or a single plenum airfoil fan with VFD controlled motor.

VFD Option: The fan housing shall be made of galvanized steel. The high performance impeller is manufactured in corrosion resistant steel, with backward curved, true airfoil shaped blades, welded into position. All wheels are coated with an anticorrosive primer and a final layer of synthetic paint. The driver pulley and the blower pulley will be made of cast iron. The motor sheave will be a variable pitch type to allow for field adjustment of CFM and external static. VFD controller located out of air stream to control motor's speed.

Return Air Filters:
- Return air will have a 4”, pleated MERV 8 disposable filters
- Optional Return air filters are washable aluminum
- Outside air, when supplied with the Full OSA Assembly, will have a 2”, extended surface MERV 7 filters

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Approvals/Listings:

- The unit is labeled and listed by ETL or UL

Selected Unit Options

Unit Location:

- The unit shall be designed for outdoor (concrete slab or equipment rail) installation

Disconnect: Not Selected

Selected Refrigeration Options

ElectroFin® E-Coating:

- All airside coils protected with ElectroFin® E-Coat. The Electro-deposition process applies a dry film thickness 0.6 to 1.2 mils which meets 6,000 hour salt spray test

Packaged Condenser:
The dehumidifier shall be equipped with an integral, full-size, air-cooled condenser to reject excess heat to the outside. The system shall be able to reject all the recovered heat (T.H.R.) outdoors.

- Aluminum fins
- Copper tubes, hydraulically expanded
- Axial condenser fans shall be of one-piece construction with an integral motor
- Fan Cycling: Fans shall be cycled based on internal head pressure
- Fan Guards: Guards shall be heavy-gauge, close-meshed steel wire with vinyl coating
- E-Fin Coating installed

Auxiliary Heater Options

Electric Heater:
The capacity shall be in accordance with the schedule. The heater shall be integral to the unit and wired to the unit as a single point power connection.
The heater coils shall be constructed of High Grade Nickel-Chrome alloy and will be insulated by floating ceramic bushings from the galvanized steel frame.

Control System Options

BMS Compatibility:
The unit's controller will have the following BMS compatibility: BACnet MS/TP

Other Options

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SYSTEM WARRANTY

Dehumidification Equipment
Standard Limited Warranty

Desert Aire warrants the dehumidifying unit to be free from defects in materials and workmanship subject to the terms, conditions and limitations stated herein.

TERMS

Desert Aire warrants all components (except as noted) for a period of two (2) years from the date of shipment. This warranty shall be limited to the supply of new or rebuilt parts for the part which has failed because of defects in workmanship or material, and does not include the cost for labor, transportation or other costs not herein provided for. Replaced parts are warranted only for the remaining portion of the original warranty period.

CONDITIONS

The warranty is subject to the following conditions:

1. The unit must be properly installed and maintained in accordance with the Desert Aire "Installation and Operation Manual" provided with each unit and/or other documentation provided.
2. The Start-Up Report must be completed and returned to Desert Aire within 30 days of the start-up.
3. This warranty shall not apply to any part that has been tampered with, or has been subject to misuse, negligence or accident. A warranty can be obtained for altered equipment but only with written consent from Desert Aire.
4. The following parts and components are excluded from the warranty: belts, filters, driers, fuses and refrigerant.
5. Refrigerant coils or other components that corrode due to improperly balanced pool chemistry or corrosive air quality will not be warranted.
6. All replacements or repairs will be FOB Germantown, WI.
7. This warranty shall be null and void if defects or damages result from unauthorized opening of the refrigerant circuit, tampering with factory set controls, or operating outside the original design conditions.
8. Desert Aire shall not be liable for labor costs incurred in diagnosing the problem, or the removal or replacement of the part or parts being repaired.
9. Desert Aire must preauthorize all warranty coverage described herein.

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Extended Warranty:
Your Desert Aire unit may have extended warrantees beyond this Standard Limited Warranty document. Extended warrantees are only available at the time of the purchase of the original equipment. These extended warrantees are covered under a separate document and their terms and conditions are separate from this document. It is mentioned in this document for informational purposes only.

Any and all incidental or consequential damages are expressly excluded from this warranty. Some states do not allow the exclusion of incidental or consequential damages for personal injury, so the above limitations may not apply to you for certain damages. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. No person or representative is authorized to make any warranty or assume any liability not strictly in accordance with the aforementioned.

Inquiries regarding warranty matters should be addressed to:

Desert Aire LLC
c/o Service Manager
N120 W18485 Freistadt Road
Germantown, WI 53022

PH: (262) 946-7400
FAX: (262) 946-7401
E-MAIL: service@desert-aire.com

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SelectAire Plus™ Dehumidifiers

Dehumidification Components
Optional Extended Warranty

Desert Aire warrants the following components to be free from defects in materials and workmanship subject to the terms, conditions and limitations stated on the standard warranty form. *(Provided if Displayed)*

COMPRESSOR THREE (3)-YEAR EXTENDED WARRANTY TERMS
For an additional fee (contact your local representative for cost), Desert Aire offers an extended three (3)-year warranty for compressors. This extended warranty begins after the system's standard two (2)-year warranty ends. This warranty will be limited to the supply of new or rebuilt parts for the part which has failed because of defects in workmanship or material, and does not include the cost for labor, transportation or other costs not herein provided for. Replaced parts are warranted only for the remaining portion of the original warranty period.

COIL THREE (3)-YEAR EXTENDED WARRANTY TERMS
For an additional fee (contact your local representative for cost), Desert Aire offers an extended three (3)-year warranty for coils. Upon special request, the coils will be coated with an Electro Fin® E-Coating. This extended warranty is only available for coated coils and begins after the system's standard two (2)-year warranty ends. This warranty will be limited to the supply of new or rebuilt parts for the part which has failed because of defects in workmanship or material, and does not include the cost of labor, transportation or other costs not herein provided for. Replaced parts are warranted only for the remaining portion of the original warranty period. Extended warranties do not apply to remote condenser coils.

COIL EIGHT (8)-YEAR EXTENDED WARRANTY TERMS
For an additional fee (contact your local representative for cost), Desert Aire offers an extended eight (8)-year warranty for coils. Upon special request, the coils will be coated with an Electro Fin® E-Coating. This extended warranty is only available for coated coils and begins after the system's standard two (2)-year warranty ends. This warranty will be limited to the supply of new or rebuilt parts for the part which has failed because of defects in workmanship or material, and does not include the cost for labor, transportation or other costs not herein provided for. Replaced parts are warranted only for the remaining portion of the original warranty period. Extended warranties do not apply to remote condenser coils.

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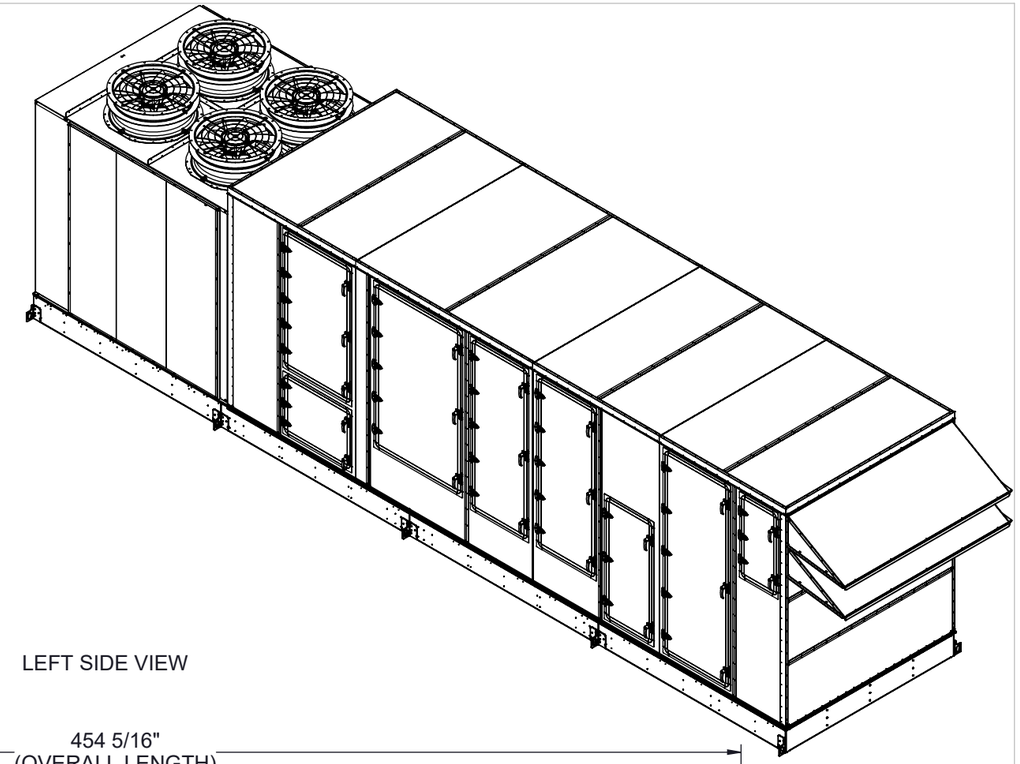
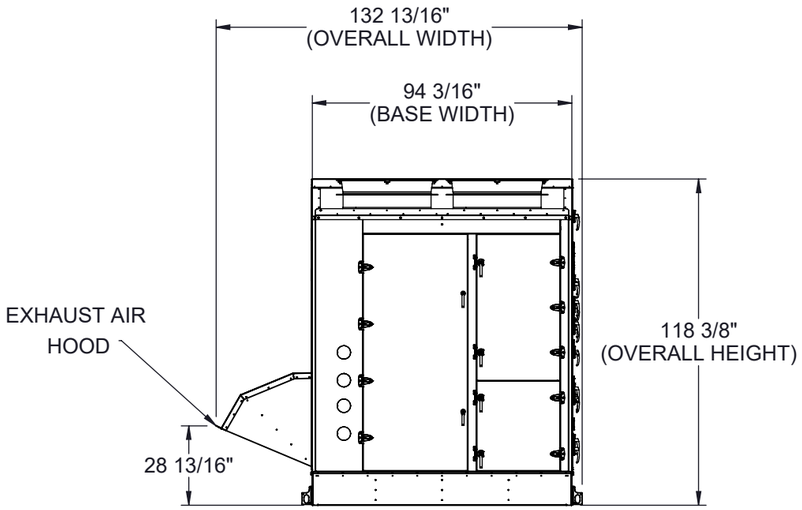
GENERAL NOTES FOR APPLICABLE SHEETS:

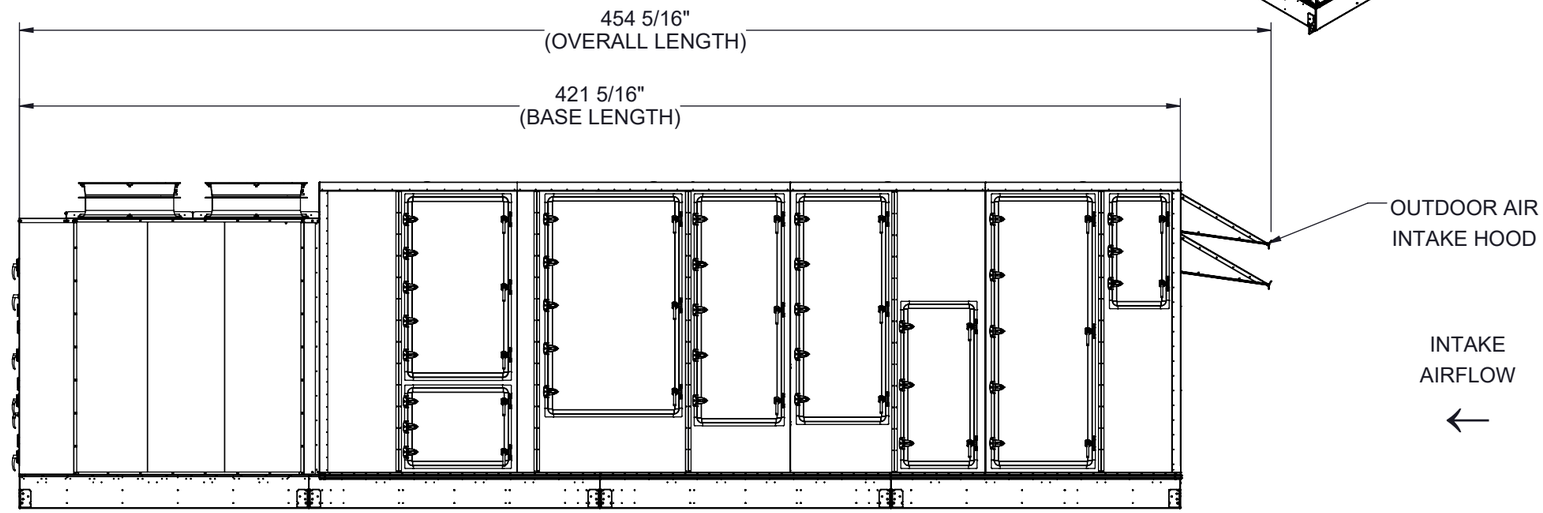
LEFT HAND ACCESS SHOWN IN ALL VIEWS
RIGHT HAND ACCESS OPTIONS LOCATED WITH SAME DIMENSIONS ON OPPOSITE SIDE UNLESS OTHERWISE SPECIFIED
WEIGHTS SHOWN REFLECT FULLY OPTIONED ESTIMATED UNIT WEIGHT



BACK VIEW



LEFT SIDE VIEW



UNIT SIZE	ESTIMATED WEIGHT (lbs.)
60 - 80 TONS	18500

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ALL DIMENSIONS ARE IN INCHES
TOLERANCE ± 1/8"

All Dimensions in Inches
All Angles 90°
All outside corners 0.125" fillet
Unless Otherwise Specified

Third Angle Projection

Part weight

Tolerance Unless Otherwise Specifed

X.X	±.125
X.XX	±.060
X.XXX	±.030
Angles	±1°

DESERT AIRE
N120 W18485 FREISTADT RD
GERMANTOWN, WI 53022
Tel: (262) 946-7400
Fax: (262) 946-7401

Drawn: ASV	Date Released: 1/19/2018	Description: SP 60-80 TON PKG ELECT HEAT
Sheet: 1/8		Page Title: GENERAL ARRANGEMENT
Scale: NTS	Rev. 5	Drawing Number: G1000-011

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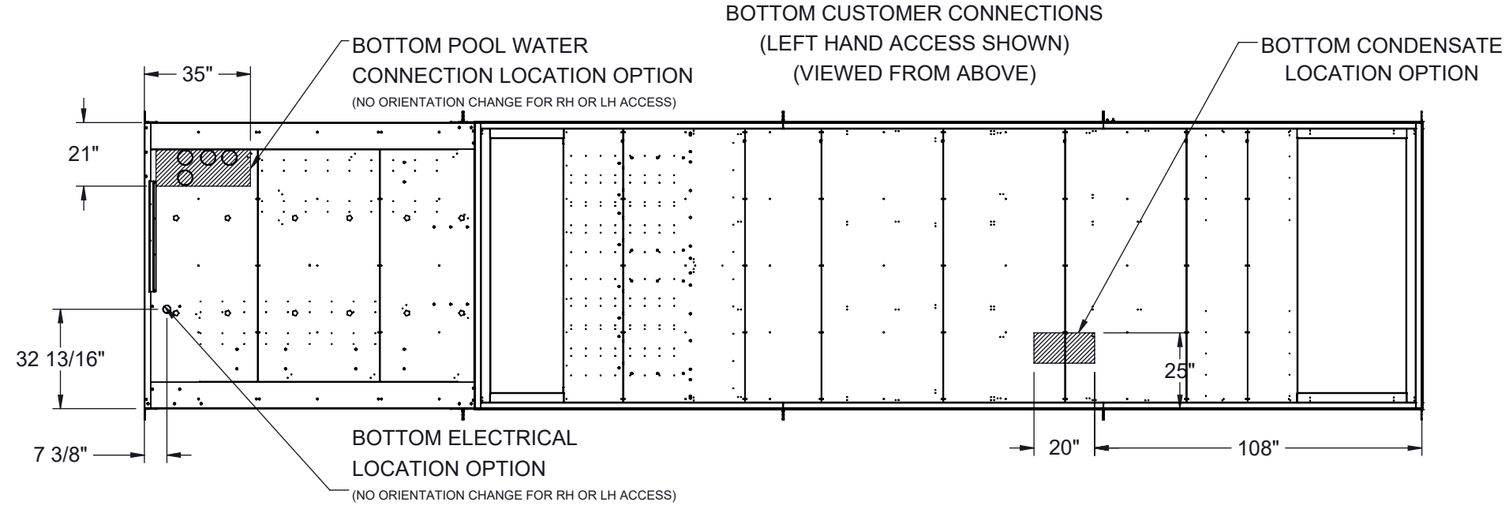
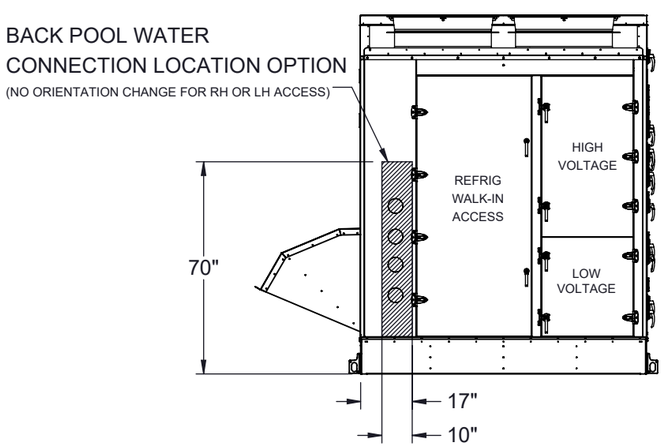
CUSTOMER CONNECTION LINE SIZE (in.)		
UNIT SIZE	60 TONS	70-80 TONS
CONDENSATE (PVC)	1 1/2	1 1/2
POOL WATER LINE CIRCUIT A (CPVC)	2	3
POOL WATER LINE CIRCUIT B (CPVC)	3	3

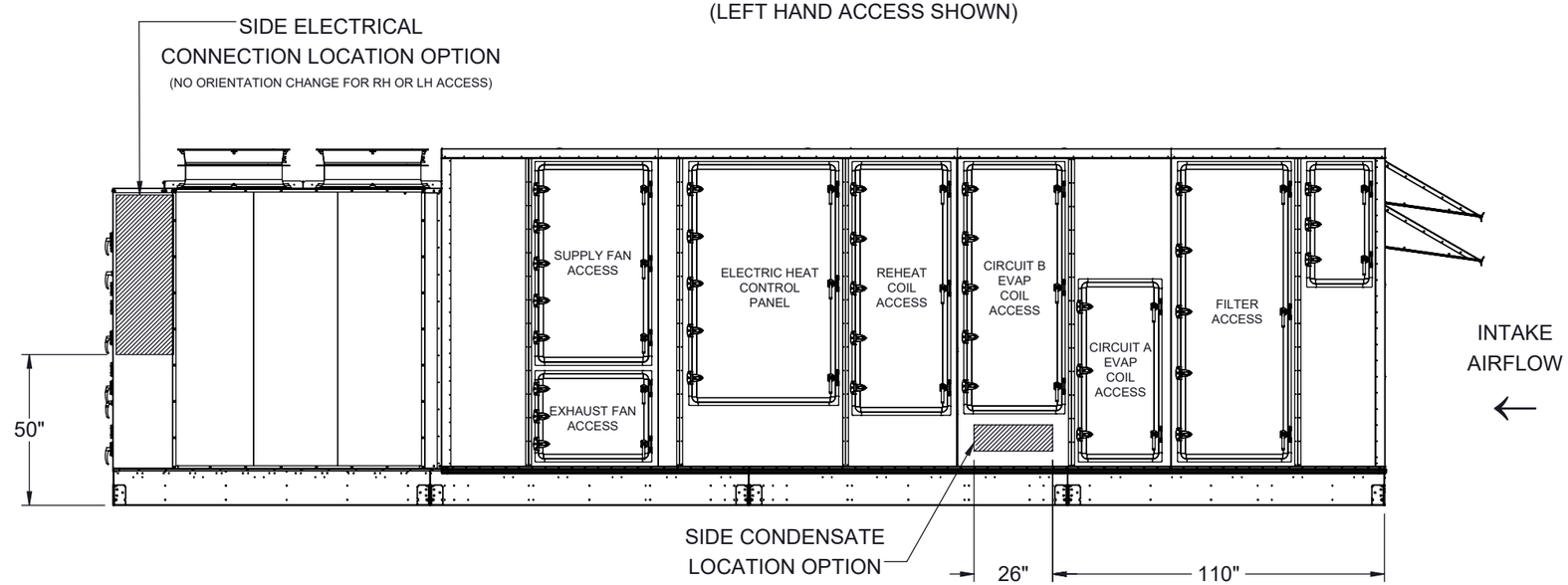
BOTTOM CUSTOMER CONNECTIONS
(LEFT HAND ACCESS SHOWN)
(VIEWED FROM ABOVE)



BACK CONNECTIONS VIEW
(NO ORIENTATION CHANGE FOR RH OR LH ACCESS)



LEFT SIDE CONNECTION VIEW
(LEFT HAND ACCESS SHOWN)



NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES
LEFT HAND ACCESS SHOWN IN ALL VIEWS
RIGHT HAND ACCESS OPTIONS LOCATED WITH SAME DIMENSIONS ON OPPOSITE SIDE UNLESS OTHERWISE SPECIFIED

FILTER INFORMATION						
UNIT SIZE	OA QTY	OA SIZE	REPLACEMENT PART NUMBER	RA QTY	RA SIZE	REPLACEMENT PART NUMBER
60-80 TONS	15	18 X 24 X 4	870-056	15	18 X 24 X 4	870-056

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TOLERANCE ± 1/8"

All Dimensions in Inches
All Angles 90°
All outside corners 0.125" fillet
Unless Otherwise Specified

Third Angle Projection

Part weight

Tolerance Unless Otherwise Specifed
X.X ±.125
X.XX ±.060
X.XXX ±.030
Angles ±1°

DESERT AIRE
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GERMANTOWN, WI 53022
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Fax: (262) 946-7401

Drawn	Date Released	Description
ASV	1/19/2018	SP 60-80 TON PKG ELECT HEAT
Sheet 2/8		Page Title CUSTOMER INTERFACE GA
Scale NTS	Rev. 5	Drawing Number G1000-011

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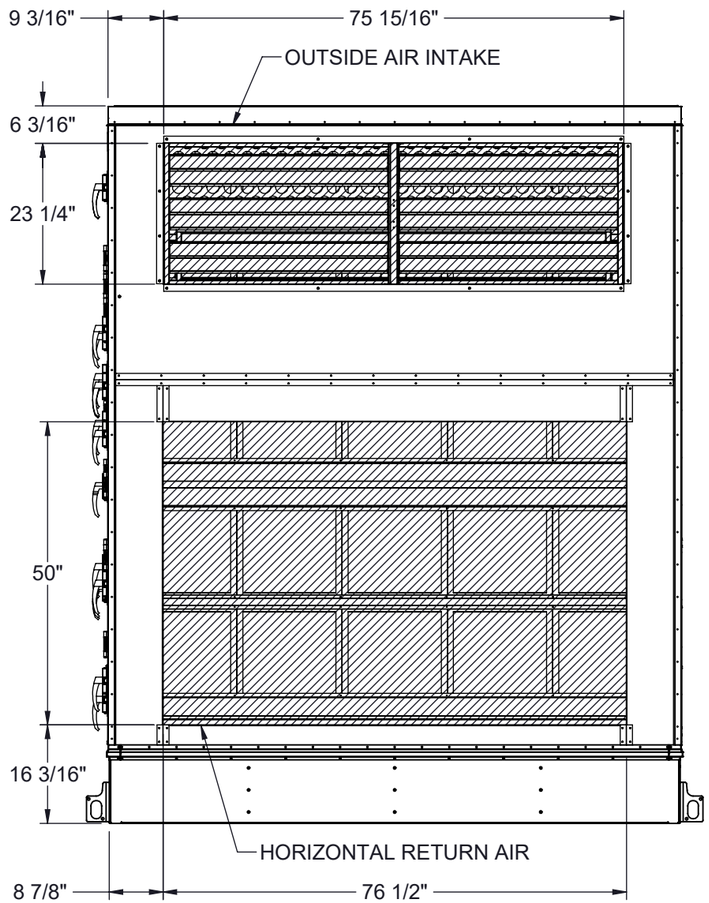
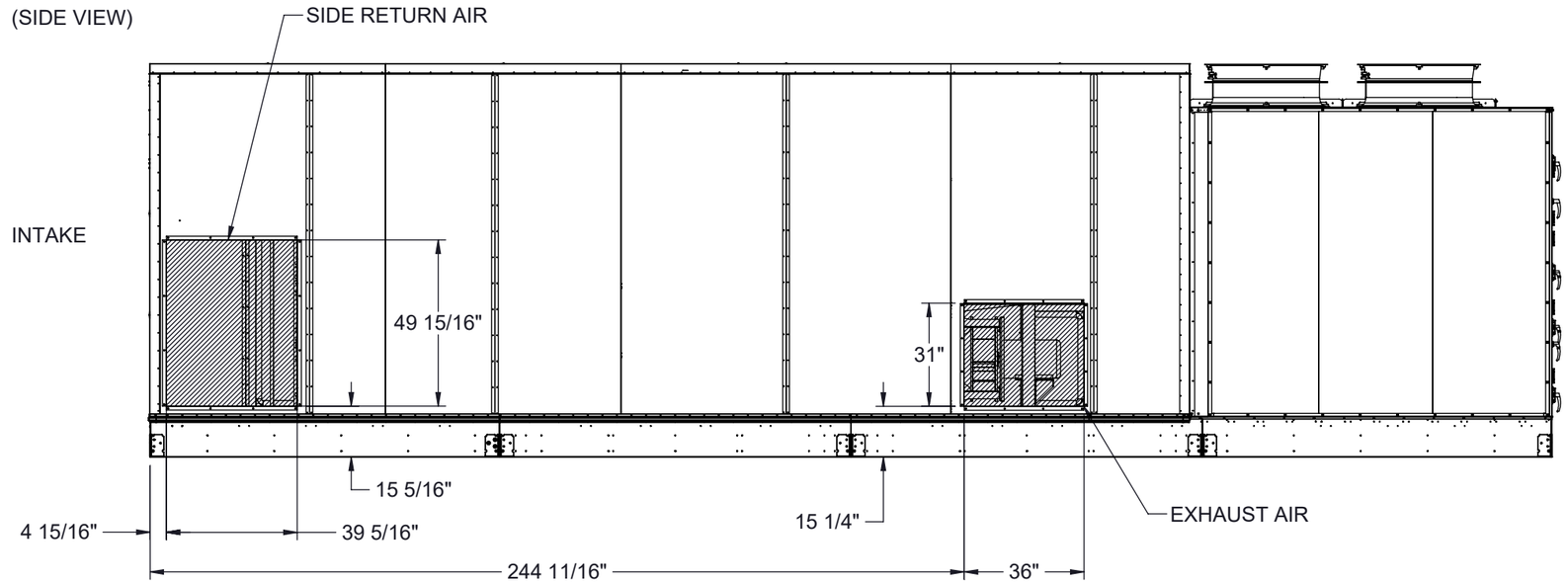
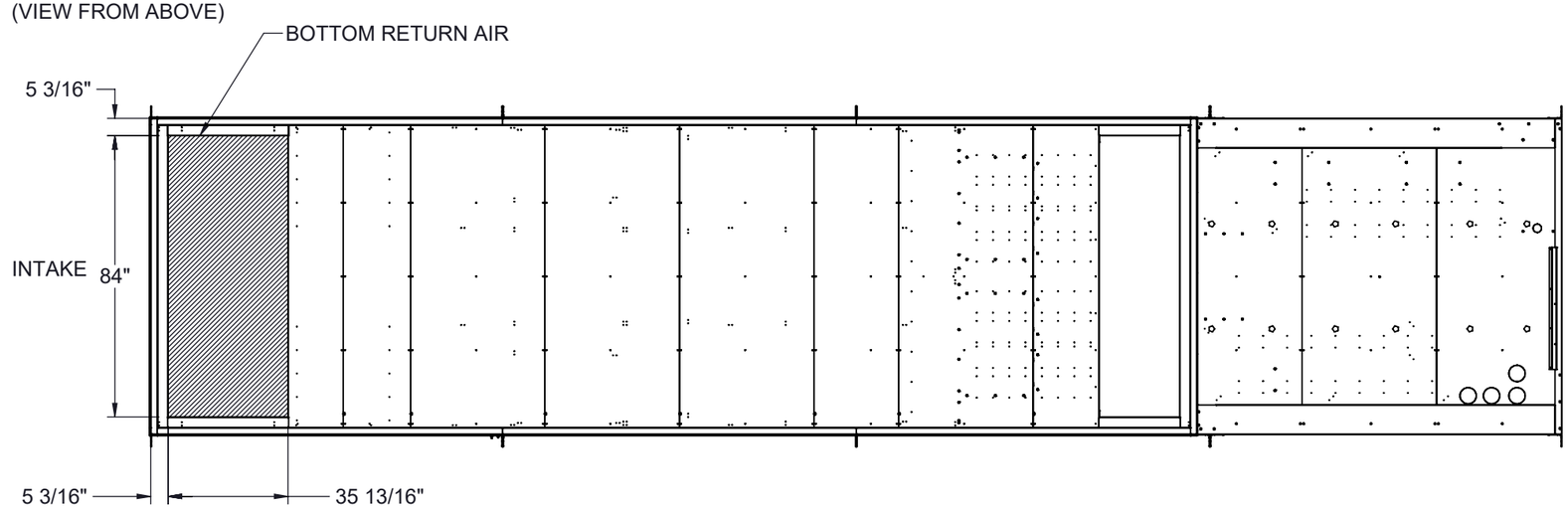
HORIZONTAL RETURN AIR OPTION
(INTAKE VIEW)



SIDE RETURN AIR OPTION
(SIDE VIEW)



BOTTOM RETURN AIR OPTION
(VIEW FROM ABOVE)



NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES
HOODS REMOVED FOR CLARITY
ACCESS SIDE RETURN AIR OPTION WILL SHIFT FILTER SECTION DOORS TO NON-ACCESS SIDE
OUTSIDE AIR INTAKE LOCATED IN THE SAME POSITION REGARDLESS OF OPTIONS

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All Dimensions in Inches
All Angles 90°
All outside corners 0.125" fillet
Unless Otherwise Specified

Third Angle Projection

Part weight

Tolerance Unless Otherwise Specifed

X.X	±.125
X.XX	±.060
X.XXX	±.030
Angles	±1°

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Drawn	Date Released	Description
ASV	1/19/2018	SP 60-80 TON PKG ELECT HEAT
Sheet 3/8		Page Title INTAKE OPTIONS GA
Scale NTS	Rev. 5	Drawing Number G1000-011

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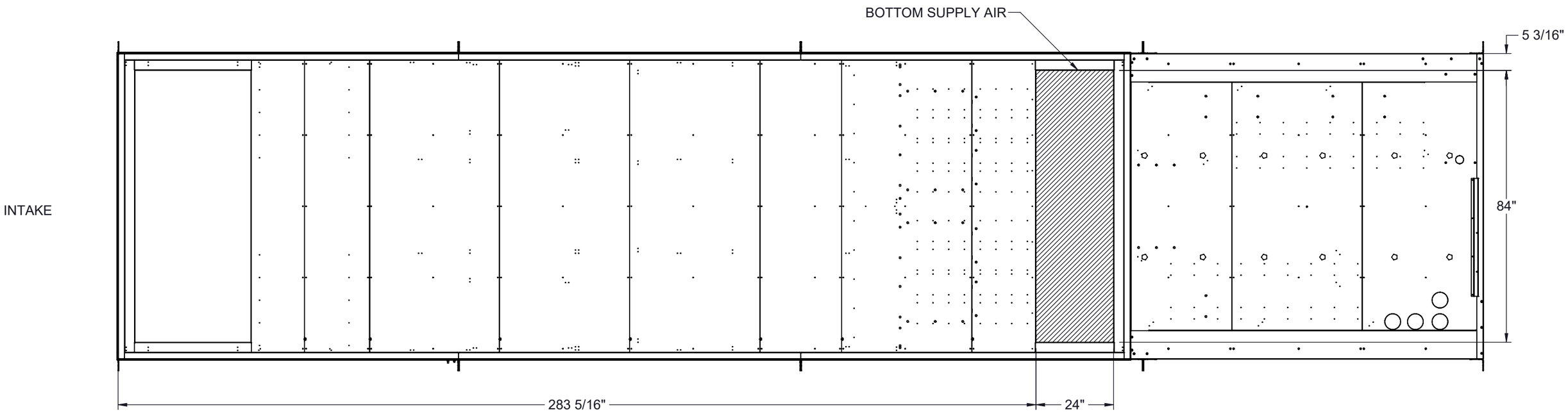
BOTTOM SUPPLY OPTION
(VIEW FROM ABOVE)
(NO ORIENTATION CHANGE FOR RH OR LH ACCESS)



NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES
LEFT HAND ACCESS SHOWN IN ALL VIEWS UNLESS OTHERWISE SPECIFIED
RIGHT HAND ACCESS OPTIONS LOCATED WITH SAME DIMENSIONS ON OPPOSITE SIDE UNLESS OTHERWISE SPECIFIED
HOODS REMOVED FOR CLARITY

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TOLERANCE ± 1/8"

All Dimensions in Inches
All Angles 90°
All outside corners 0.125" fillet
Unless Otherwise Specified

Third Angle Projection

Part weight

Tolerance Unless Otherwise Specifed

X.X	±.125
X.XX	±.060
X.XXX	±.030
Angles	±1°

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Sheet: 4/8		Page Title: DISCHARGE OPTIONS GA
Scale: NTS	Rev. 5	Drawing Number: G1000-011

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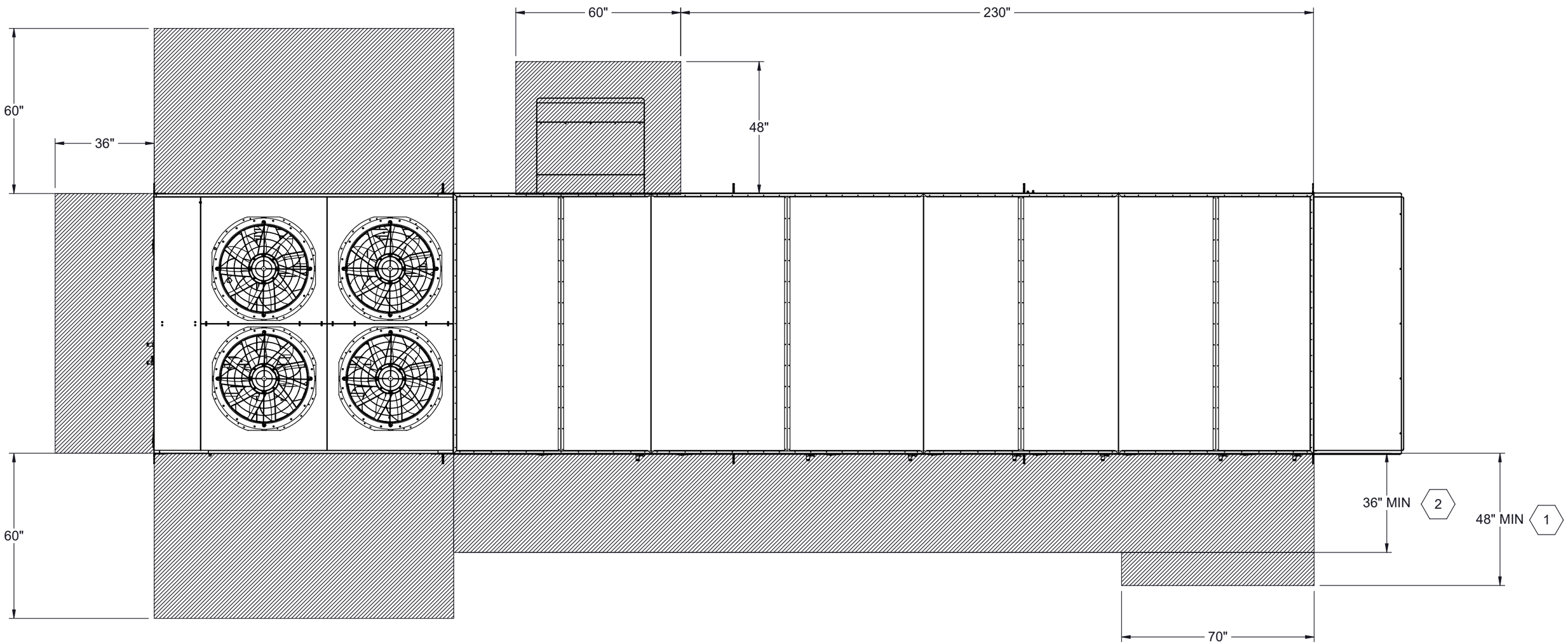

1 96" RECOMMENDED FOR FILTER ACCESS.

2 120" CLEARANCE ON ACCESS SIDE RECOMMENDED FOR FAN AND COIL SERVICE

NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES
LEFT HAND ACCESS SHOWN IN ALL VIEWS
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Part weight

Tolerance Unless Otherwise Specifed

X.X	±.125
X.XX	±.060
X.XXX	±.030
Angles	±1°

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Drawn	Date Released	Description
ASV	1/19/2018	SP 60-80 TON PKG ELECT HEAT
Sheet 5/8		Page Title UNIT CLEARANCE GA
Scale NTS	Rev. 5	Drawing Number G1000-011

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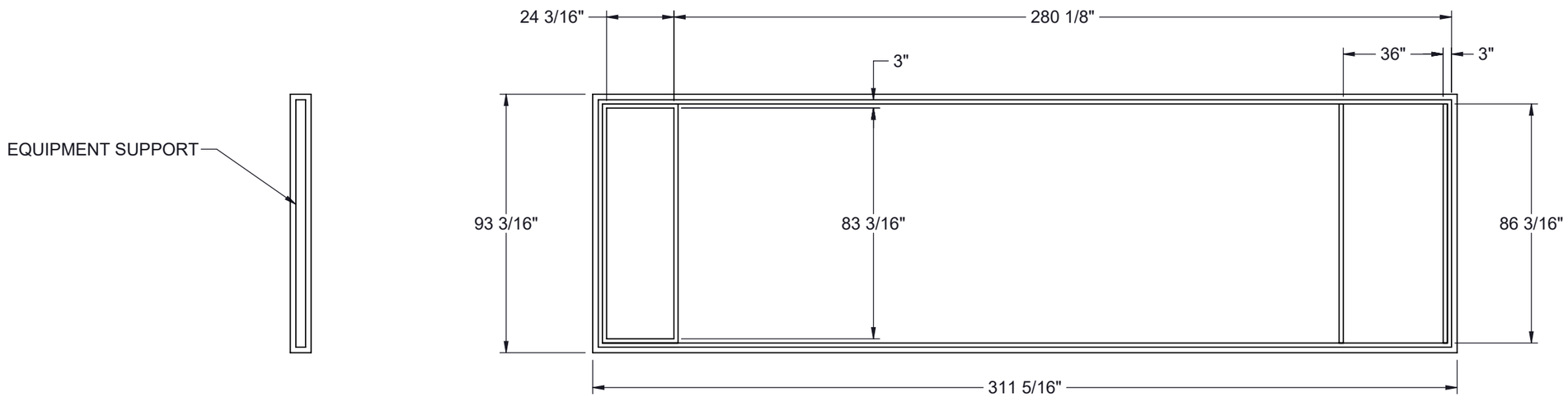
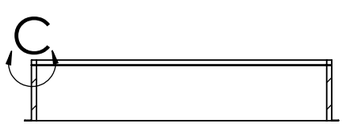
UNIT TON	18" CURB	24" CURB
60-80	CB-80PEBN-18	CB-80PEBN-24

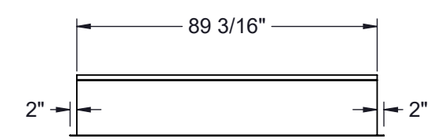
NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES

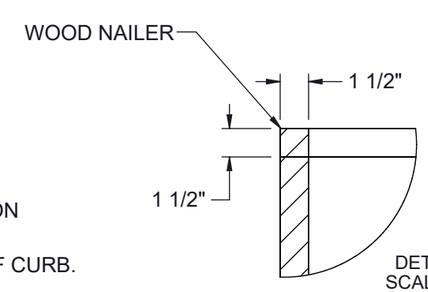
1. 14 GA GALVANIZED STEEL CONSTRUCTION
2. PRIME PAINTED AFTER FABRICATION
3. PRESSURE TREATED WOOD NAILERS
4. 1-1/2" THICK 3LB/FT^3 FIBERGLASS PERIMETER INSULATION
5. INTERNAL ANGLE REINFORCEMENT
6. CURB TO BE SHIPPED KNOCKED DOWN





SECTION B-B





DETAIL C
SCALE 1 : 8

NUMBER AND LOCATION OF CROSS SUPPORTS IS DEPENDANT UPON
THE GUAGE OF MATERIAL USED TO CONSTRUCT THE CURB,
DUCT SUPPORT CONFIGURATION LENGTH OF CURB, AND WIDTH OF CURB.
INSTALLATION INSTRUCTIONS INCLUDED WITH CURB
SHIPMENT INDICATE THE REQUIRED POSITION FOR FIELD ASSEMBLED CURBS.

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Third Angle Projection

Part weight

Tolerance Unless Otherwise Specifed

X.X	±.125
X.XX	±.060
X.XXX	±.030
Angles	±1°

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Drawn	Date Released	Description
ASV	1/19/2018	SP 60-80 TON PKG ELECT HEAT
Sheet 6/8		Page Title CURB DETAIL GA
Scale NTS	Rev. 5	Drawing Number G1000-011

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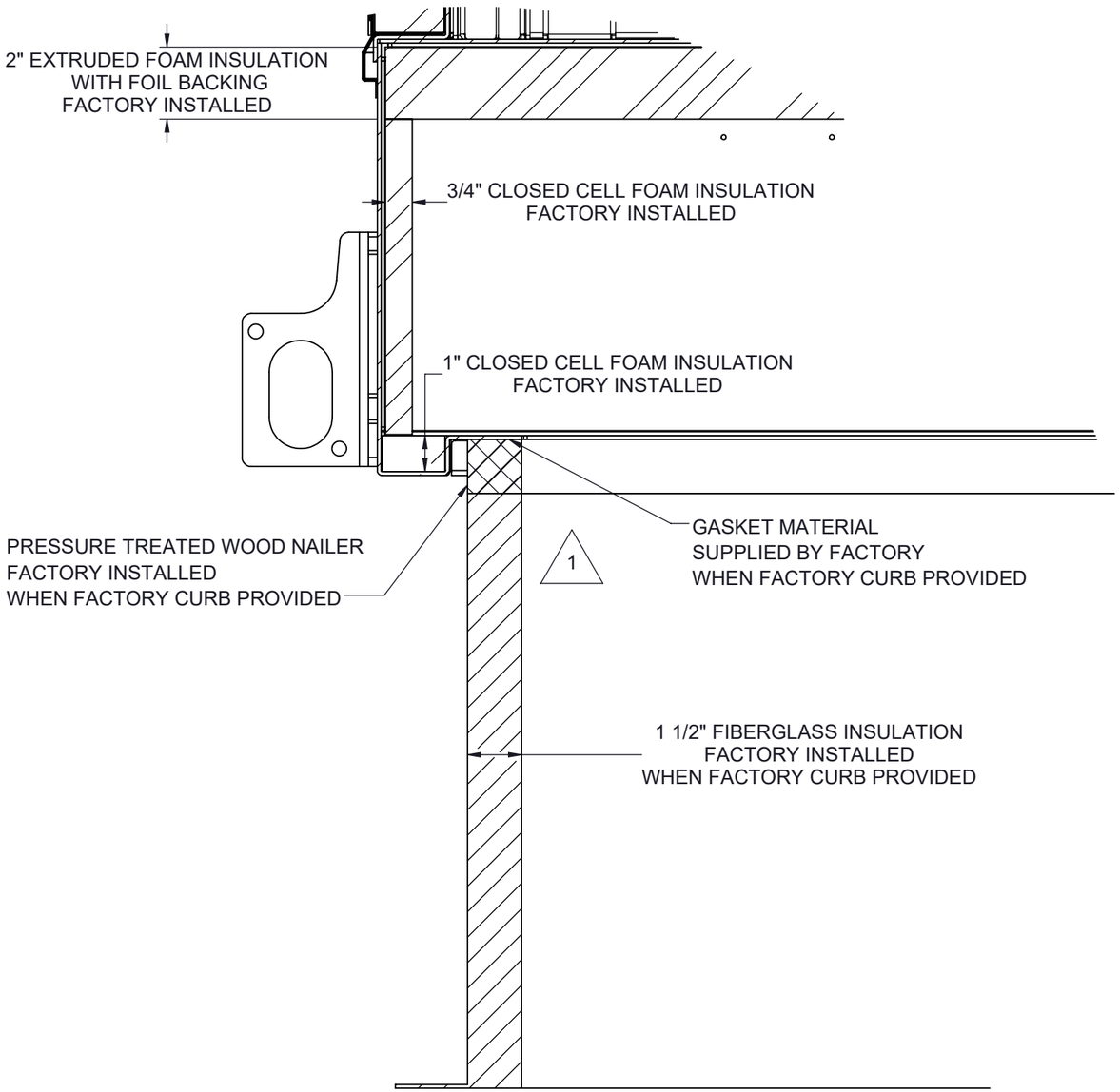
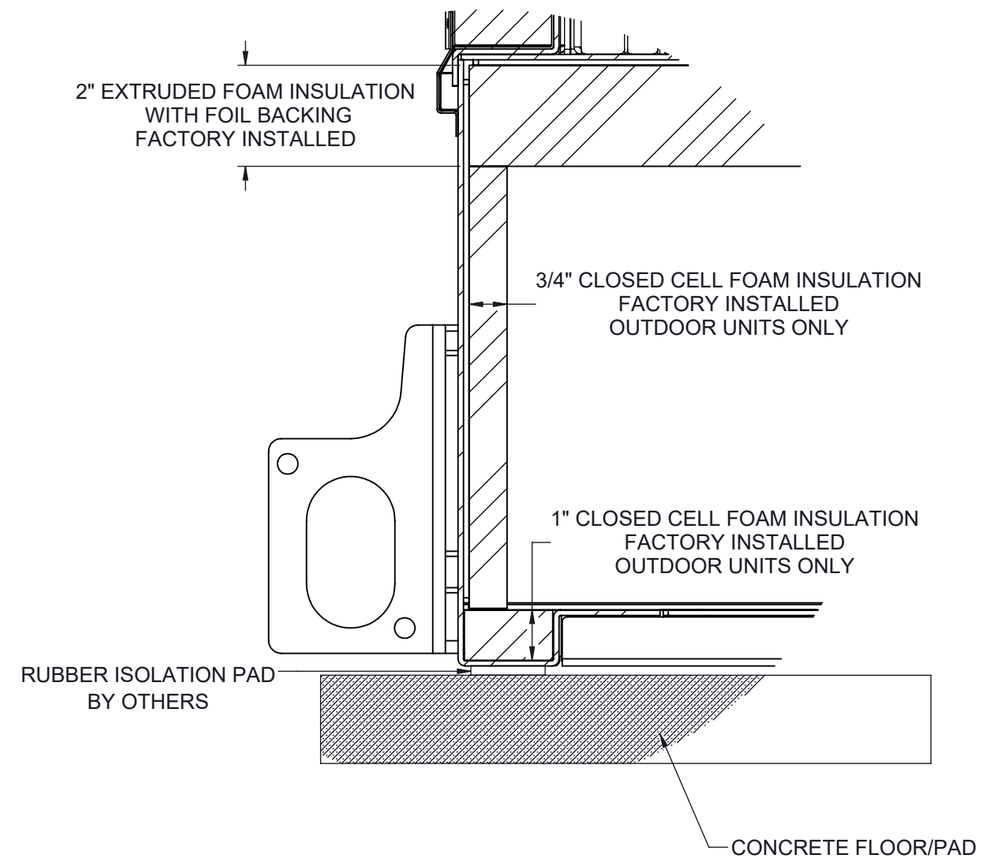
CURB MOUNT



PAD MOUNT



1 ALL EXPOSED METAL TO BE SPRAY FOAM INSULATION AFTER INSTALLATION

NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES
SEE SHEET 6 NOTES FOR CURB SPECIFICATIONS

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TOLERANCE ± 1/8"

All Dimensions in Inches
All Angles 90°
All outside corners 0.125" fillet
Unless Otherwise Specified

Third Angle Projection

Part weight

Tolerance Unless Otherwise Specifed

X.X	±.125
X.XX	±.060
X.XXX	±.030
Angles	±1°

DESERT AIRE
N120 W18485 FREISTADT RD
GERMANTOWN, WI 53022
Tel: (262) 946-7400
Fax: (262) 946-7401

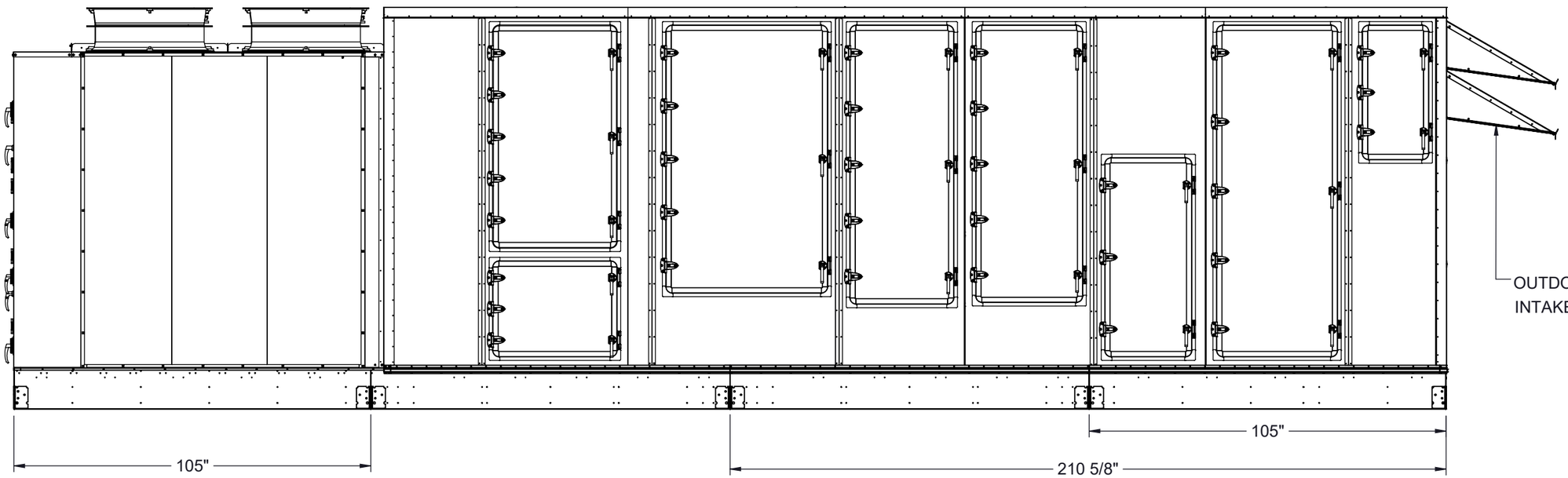
Drawn	Date Released	Description
ASV	1/19/2018	SP 60-80 TON PKG ELECT HEAT
Sheet 7/8		Page Title MOUNTING DETAIILS GA
Scale NTS	Rev. 5	Drawing Number G1000-011

G1000-011

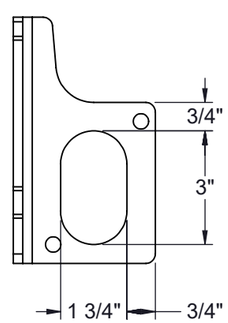
SHIP LOOSE ITEMS

EXHAUST HOOD

DA PART NO	DESCRIPTION	QTY
HOOD	EXHAUST ASSEMBLY	1
807-023	SCREW #8-18X1/2 SS	36
990-105	CAULK WHITE	1



LUG DETAIL



NOTES:

REFER TO SHEET 1 FOR GENERAL NOTES AND HOOD DETAILS

Desert Aire has a policy of continuous product and quality improvement. Specifications and dimensions are subject to change without notice. This drawing and information contained herein are the exclusive property of the Desert Aire Corporation. Any use detrimental to the interests of Desert Aire is prohibited.

ALL DIMENSIONS ARE IN INCHES
TOLERANCE ± 1/8"

All Dimensions in Inches
All Angles 90°
All outside corners 0.125" fillet
Unless Otherwise Specified

Third Angle Projection

Part weight

Tolerance Unless Otherwise Specifed

X.X	±.125
X.XX	±.060
X.XXX	±.030
Angles	±1°

DESERT AIRE
N120 W18485 FREISTADT RD
GERMANTOWN, WI 53022
Tel: (262) 946-7400
Fax: (262) 946-7401

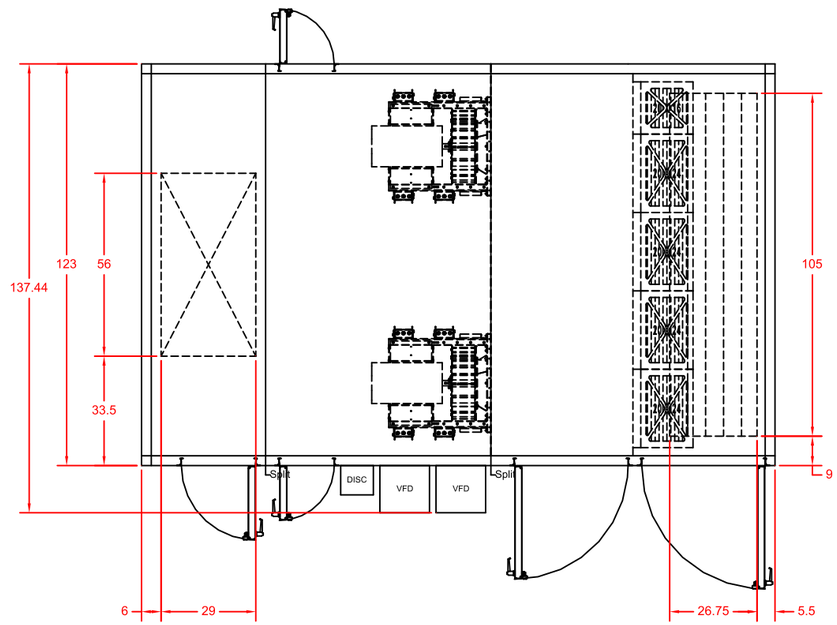
Drawn	Date Released	Description
ASV	1/19/2018	SP 60-80 TON PKG ELECT HEAT
Sheet		Page Title
8/8		SHIPPING/LIFTING DETAILS GA
Scale	Rev.	Drawing Number
NTS	5	G1000-011

2023_09A

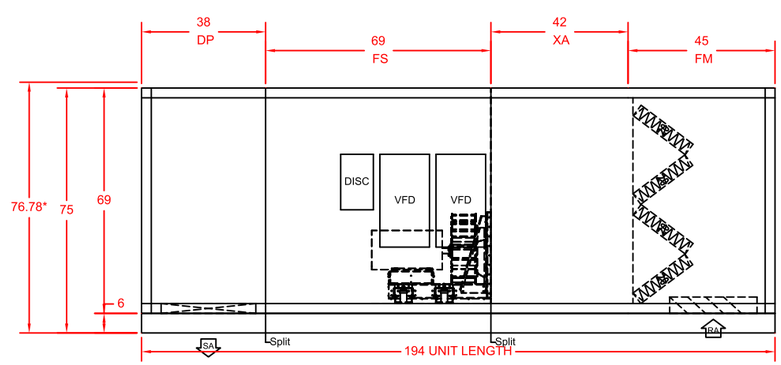
SP Pool Dehumidifier

UNIT TAG	DH-1,2
UNIT MANUFACTURE	DESERT AIRE
MODEL NO	SP70
LOCATION	Outdoor
UNIT WEIGHT	20,500 lbs.
FAN DATA	
SUPPLY AIR FLOW - CFM	35,000
TOTAL ESP (in. W.C.)	3.50
S/A FAN TSP (in. W.C)	6.51
S/A FAN HP	Qty 4 | 60
OUTSIDE AIR FLOW - CFM (MAX)	19,000
EXHAUST AIR FLOW - CFM (MAX)	20,000
E/A ESP AT MAXIMUM FLOW (in. W.C.)	0.00
E/A FAN TSP (in. W.C)	3.96
E/A FAN HP	Qty 2 | 30
PERFORMANCE	
EAT DB | WB (°F) | %RH	84.0 | 73.1 | 60
MOISTURE REMOVAL CAPACITY - LB/HR	387.3
TOTAL COOLING CAPACITY BTUH	793.8
SENSIBLE COOLING CAPACITY BTUH	385
THR BTUH	1,016
COMPRESSOR Circuit A	30
COMPRESSOR Circuit B	35
UNIT ELECTRICAL	
VOLTAGE	460/3/60
MOPD	400
MCA	341
SHORT CIRCUIT CURRENT RATING (SCCR)	5kA or greater
AUXILIARY HEATING	
TYPE	Electric
kW	070
HWC FLUID pD	#DIV/0!
HWC # ROWS	#DIV/0!
POOL WATER HEAT RECOVERY	
REMOTE COOLING DATA	
INTEGRAL PACKAGED CONDENSER	
AMBIENT TEMPERATURE (°F)	105
NO. OF FANS	4
HORSEPOWER (EA)	4
POWER (kW EA)	2.8
COIL SECTION LEAVING AIR CONDITIONS*	
FULL COOLING MODE (°F)	74.1

SF-1&2



PLAN VIEW

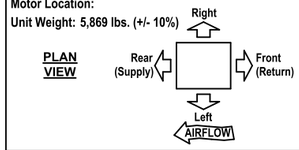


* NOTE: MAX HEIGHT
TO PEAK OF SLOPED ROOF

ELEVATION VIEW

UNIT CONSTRUCTION

Model: Solution-XTO-69x123 Construction: Outdoor
Motor Location:
Unit Weight: 5,869 lbs. (+/- 10%)



NOTES

Units with a baserail and a bottom opening: Duct connection flush with the bottom of unit, not flush with bottom of baserail.

Refer to performance report for shipping split details.

Allow sufficient space around the unit for removing the access panels and various parts of the unit. A minimum clearance equal to the width of the unit must be provided on one side of the unit for removing the coil or fan assembly.

Contractor responsible for penetrations and connections of all electrical boxes and internal coil connections.

Overall dimensions account for: outdoor roof peak and overhang, motor control and/or factory package control boxes, coil connections, rain hoods, pipe chases, AMS-60 damper/EAML louver (if applicable,) base rail - in order to convey the true space requirements for the unit.

Certain items may extend beyond cabinet dimensions including: door handles, light switches, electrical boxes, lifting lugs, gas fuel system, etc.

The overall unit length includes an additional 1/4" per shipping split due to additional gasketing and split connection hardware.

Dimension tolerances: Unit (+/- 1/2"); Piping (+/- 2")

SL - Designates Shipped Loose Item(s)

PIPING CONNECTIONS
(In order of Airflow)

Segment	Type	Hand	Quantity	Supply	Return

SECTION LIST

SECT	DESCRIPTION
FM	Filter/Mixing Box
XA	Variable Length Access
FS	Supply Fan - 222 - DDPG2
DP	Discharge Plenum

PRODUCT DRAWING

SOLUTION XT AIR HANDLING UNIT DETAIL
MODEL: Solution-XTO-69x123
NOT FOR CONSTRUCTION

Project Name: Ocala Aquatics
Location:
Engineer:
Contractor:
For:

Sold To:
Cust Purch Order#:
Contract#:
UNIT TAG: SF-1 & 2

Date: 7/30/2020 16:38:45
Version:
Form No.:
Dwg. Lev.: 5/03
Dwg. Scale: NTS

Serial Number:
SQ Database Number:
YORKworks Release:
Dwg. Name:
Dwg. Location:

Johnson Controls

YORKworks Version: 20.02a Drawing Generator Version : 01:00:19906

YORK® Solution Endura™ Air Handling Unit Performance Report

Job Summary

Project Name:	Ocala Aquatics		
Unit Tag(s):	SF-1&2		
Quantity:	1	**Environment:**	Outdoor

Unit Overview

Model	Cabinet Performance	Airflow (CFM)	Altitude (ft)	Weight (lbs)
XTO-69x123	Solution	20,000	10	5,869

Segment Sequence

(DP)(FS)(XA FM)

Unit Construction

Casing Details

Segment(s)	Thickness (in)	Exterior Paint	Exterior Gauge and Material	Interior Gauge and Material	Insulation Thickness and Material	Bulkhead Material
FM , XA , FS , DP	2	STD Exterior Paint	STD Ga. G-90 Galvanized	STD Ga. G-90 Galvanized	2" Foam	Galvanized

Base Details

Segment(s)	Base		Floor				
	Gauge and Material	Paint	Gauge and Material	Paint	Insulation	Attachment	Tread Plate
FM, XA, FS, DP	Standard Formed Steel	None	STD Ga. G-90 Galvanized	None	N/A	-	Aluminum Diamond Plate

Unit Electrical

Circuit Details

Circuit #	Component(s)	V/Ph/Hz	Full Load Amps (FLA)	Minimum Current Ampacity (MCA)	Maximum Overcurrent Protection (MOP)
1	Supply Fan Motor Control, Supply Fan Motor Control	460/3/60	36.2	40.7	50.0

Electrical Details

Minimum Unit SCCR	-	**ETL Label (UL1995/NEC-2002)**	Yes

Unit Light Type	Unit Light Switch
-	-

Supply Fan(s)

Performance Details

Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)
Lau	DDPG2	II	222-9	120	100	2	20,000	10	4.02	2.50	1,989	9.64

Performance Details

Fan Manufacturer	Model	Class	Size	% Wheel Width	% Wheel Diameter	Quantity	Total Airflow (CFM)	Altitude (ft)	TSP (in w.g)	ESP (in w.g)	Fan Speed (RPM)	Fan Power (BHP)

Drive Type	Wheel Type	Blade Type	Wheel Material	Base Material	Fan Flow Isolation	AirFlow Monitoring	Isolation Type	Total Eficiency (%)	Outlet Velocity (ft/s)	Max Speed (RPM)
Direct Drive	SWSI	Airfoil	Aluminum	Galvanized Steel	Back-Draft Counter Balance	Yes (K=2649.00)	2" Spring	65.64	671	2,454

Motor Details

Type	Manufacturer	Motor Power (HP)	V/Ph/Hz	Quantity	Insulation Class	Motor Speed (RPM)	Frame Size	Full Load Amps (Amps)	Efficiency	Location
TEFC	Baldor	15.0	460/3/60	2	H	1,800	254	18.10	Premium	Direct Drive

At Motor Synchronous Details

TSP (in w.g.)	Total Air Flow (CMF)	Fan Speed (RPM)	Motor Correction Factor(%)	Fan Power (BHP)	Total Eficiency (%)
4.02	10,000	1,989	92.4	9.64	65.64

Filter(s)

Details

Segment	Type	Depth	Filter Loading	Media/MERV	# of Spares	Spare Filter Media	Frame Material
FM	Primary Filter	4" Mini-Pleat	Side	60-65% Eff, (MERV 11)	1	60-65% Eff, (MERV 11)	Galvanized

Sizes

Segment	Filter	1st Filter Size W x H (in)	1st Qty	2nd Filter Size W x H (in)	2nd Qty
FM	Primary Filter	24x20	16	16x20	4

Filter Gauge Details

Location	Type	Range (in w.g)
Door	Magnehelic with Flag	0 - 1

Damper(s)

Details

Segment	Air Path	H x W (in)	Total Face Velocity (ft/min)	CFM	Minimum Allowable OA CFM	Damper Type	Damper Config	Model	Material	Blade Orientation	Actuator Type	Fail Position
FM	Return Air	26.75 x 105.00	1,025	20,000	-	Control	100%	CD50	Aluminum	Parallel	-	-

Door(s)

Details										
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	Test Port	Spare Gasket	Thermal Break	Safety Latch	Noncontact Safety Interlock
FM	Left	Outward	Upstream Side	63 x 39 x 2	None	-	-	Yes	-	-
XA	Left	Outward	Downstream Side	63 x 36 x 2	None	Yes	-	Yes	-	-
FS	Left	Outward	Downstream Side	63 x 18 x 2	None	-	-	Yes	Yes	-
FS	Right	Outward	Downstream Side	63 x 18 x 2	None	-	-	Yes	Yes	-
DP	Left	Outward	Upstream Side	63 x 24 x 2	None	-	-	Yes	Yes	-

Motor Control(s)

Details										
Segment	Type	MMP	V/Ph/Hz	Input/Output Amps*	Efficiency	Heat Loss (at 100% load)	Enclosure	Bypass	Disconnect Type	RFI/EMI EMC Filter
FS	ABB VFD - Airmod AYK	-	460/3/60	23.0/23.0	92 %	337	NEMA 3R	-	Fused	Yes

Notes
*Drives are rated for use below 3,000 ft and 104°F. Use Derating Charts in Air-Mod Engineering Guide Form 100.42-EGI (212) for use above these limits.
Storage Temperature: -40°F to 158°F
Humidity: MAX 95% RH non-condensing
Altitude: 3,300 ft. without derate (1% derate for each additional 330 ft.)
Overload Current Rating: 100% for 1 minute every 10 minutes.
The Class 10 trip rating of the MMP device will not withstand an across-the-line start of a fan and should not be used with VFDs with bypass circuits.
The customer must provide a platform or catwalk for accessing the power-disconnect.
Copper Conductors Only.
FS: Contains the following option: Swinging DC Line Choke (Equivalent to 5% Input Line Reactor)

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (sq. ft)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
FM	Opening	19.5	20,000	1,025	0.18	0.00
FM	Control Aluminum (CD50)	0.0	20,000	0	0.03	0.00
FM	4" Mini-Pleat 60-65% Eff, (MERV 11)	62.2	20,000	321	0.20	0.00
FM	Dirty Filter Allowance	0.0	20,000	0	0.30	0.00
FS	Backdraft Aluminum (CBD6)	0.0	20,000	0	0.18	0.00
FS	External Static - User Entered	0.0	20,000	0	2.50	0.00
DP	Opening	11.3	20,000	1,773	0.63	0.00
				Total	**4.02**	**0.00**

Dimensions and Weight

Details					
Segment	**Description**	**Length[1] (in)**	**Width[2] (in)**	**Height (in)**	**Weight (lbs)**
FM	Filter / Mixing Box	45	123	69	1,086
XA	Variable Length Access	42	123	69	827
FS	Supply Fan - SWSI	69	123	69	2,913
DP	Discharge Plenum	38	123	69	1,043
Overall		**194**			**5,869**

Notes

[1]The length includes bottom tier segments only

[2]The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

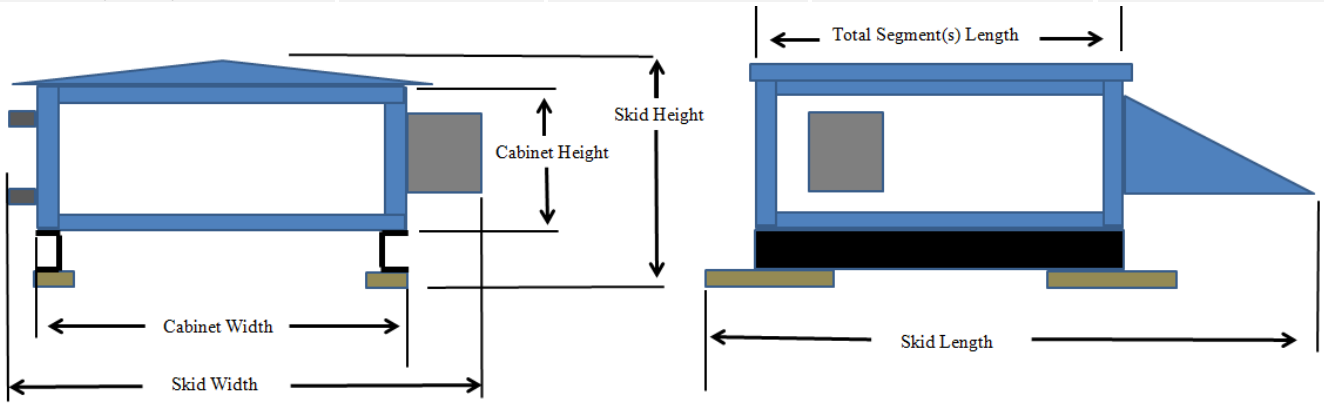
Statement of Compliance

Details

YORK® Solution XT AHU's meet IBC seismic requirements for non-critical equipment (Ip = 1.0) for locations with design spectral response Sds <= 0.43. Units must be rigid mounted.
The anchorage of the unit to the ground or building structure needs to be evaluated by and is the responsibility of the engineer of record. Specification of seismic requirements is the responsibility of the project design engineer. If formal certification is required, please contact your sales representative and/or application engineer for review. Certain application and site requirements may require additional cost and/or lead time.
Component locations are listed as Segment Hand (Unit Hand): ex. Left (Right). See SubmittalDrawing for additional details
Air handling unit parameters vary depending on conditions. Parameters such as airflows, air pressure drops, and coil capacities are shown for design conditions.

Shipping Summary

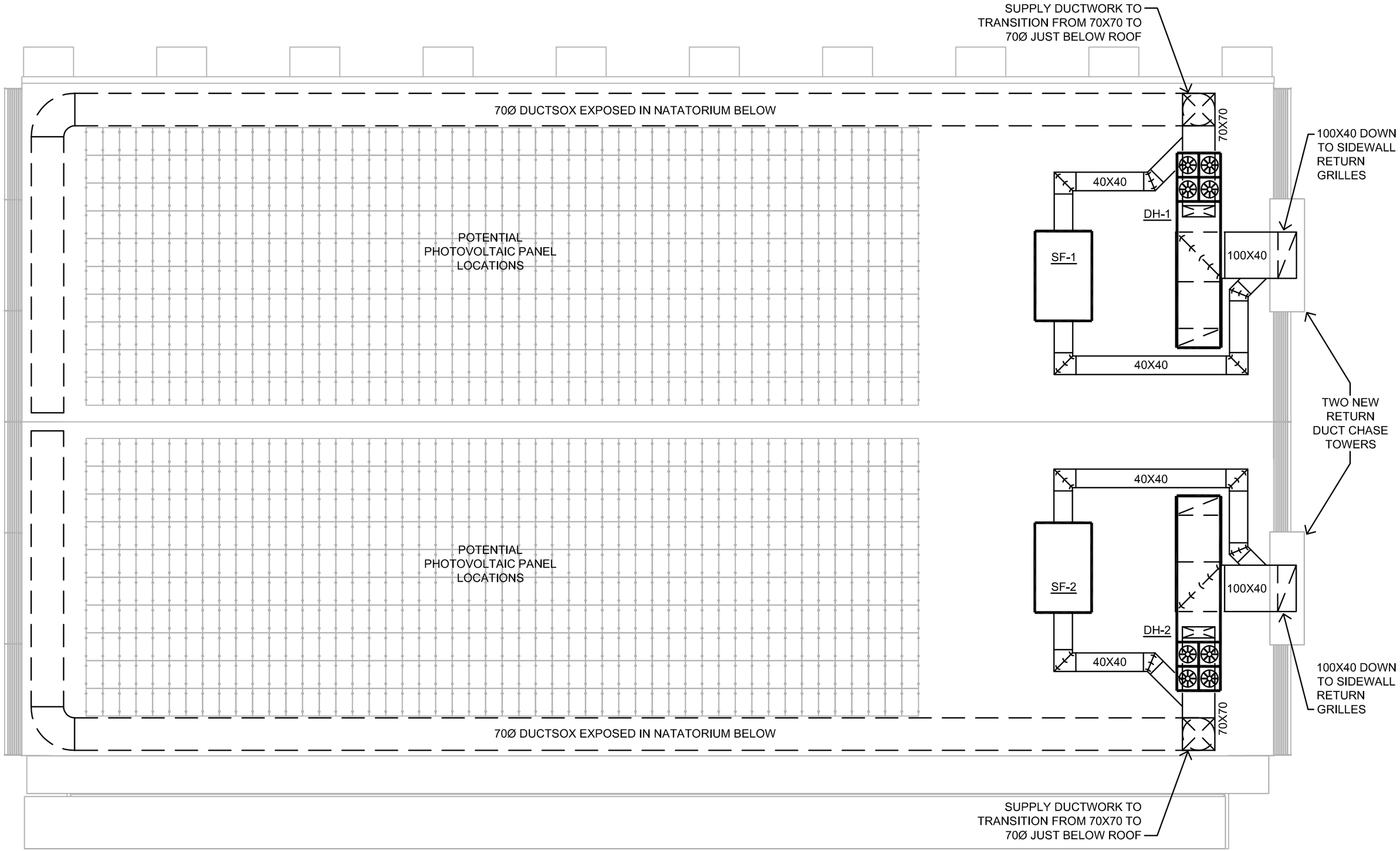
Details				
Skid	**Skid Length (in)**	**Skid Height (in)**	**Skid Width (in)**	**Skid Weight (lbs)**
(DP)	48	81	128	1,043
(FS)	69	81	141	2,913
(XA FM)	87	81	128	1,913



Notes
Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).
Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping wood-blocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).
Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges,tie-down brackets, shipping wood-blocks, front dampers, split connectors, electrical/control components, outrigging extensions, isolation dampers, inlet baskets).

EMERALD ENGINEERING INC.
9942 Currie Davis Dr., Ste. H
Tampa, FL 33619
813.995.0300
emeraldmep.com
FL EB # 0027845

APPENDIX B



N

HVAC OPTION 1 - ROOF PLAN

SCALE: 1/16" = 1'0"

9942 Currie Davis Dr., Ste. H
Tampa, FL 33619
813.995.0300
emeraldmep.com
FL EB # 0027845

APPENDIX C

Energy Model Output Report

Project:	Long Center Option#1
Address:	1501 N Belcher Rd. Clearwater, FL 33765
Climate File:	USA_FL_St.Petersburg-Clearwater.Intl.AP.722116_TMY3.epw
Simulation:	Natatorium Option1_1206.aps

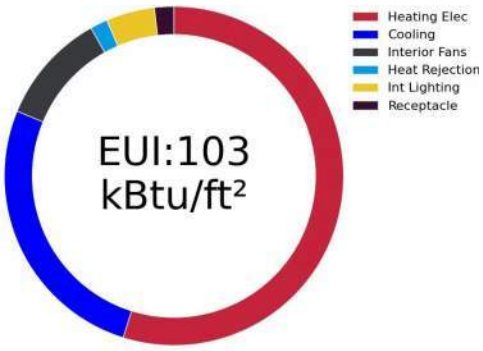
Design Team:	Wannemacher Jensen Architects
Energy Analyst:	REAL Building Consultants LLC
Owner:	City of Clearwater
Conditioned Area (ft²):	34959.4935

Annual Energy Consumption (kBtu/ft²/year) & CO2 KgCO2/ft²/yr

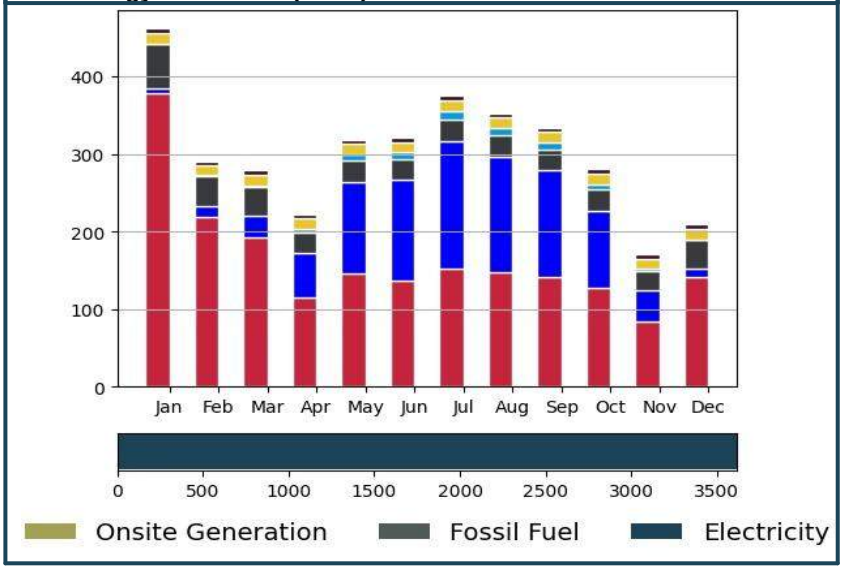
Energy End Use	Site Energy	Source Energy	CO2 Emissions
Heating Fossil Fuel	0.0	0.0	0.0
Heating Electricity	56.7	178.7	10.0
Space Cooling	27.3	86.0	4.8
Fans Interior	11.0	34.5	1.9
Heat Rejection	1.7	5.5	0.3
Pumps	0.0	0.0	0.0
DHW Fossil Fuel	0.0	0.0	0.0
DHW Electricity	0.0	0.0	0.0
Interior Lighting	4.8	15.0	0.8
Exterior Lighting	0.0	0.0	0.0
Receptacle	1.9	6.1	0.3
Data Center	0.0	0.0	0.0
Cooking Fossil Fuel	0.0	0.0	0.0
Cooking Electricity	0.0	0.0	0.0
Elevators & Escalators	0.0	0.0	0.0
Refrigeration	0.0	0.0	0.0
Process	0.0	0.0	0.0
TOTAL (ex renewables)	**103**	**325**	**18**

Project Viewer - 3D Model

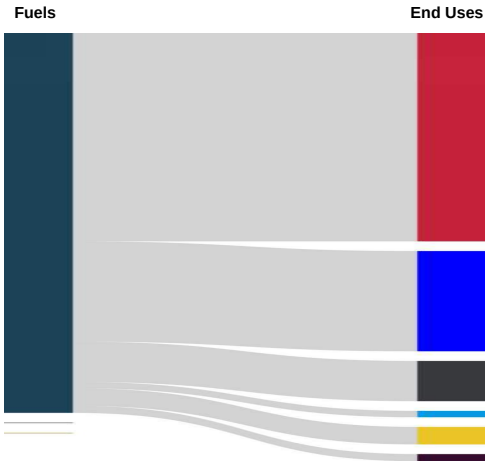
Site Energy Use Intensity



Site Energy Dashboard (MBtu)



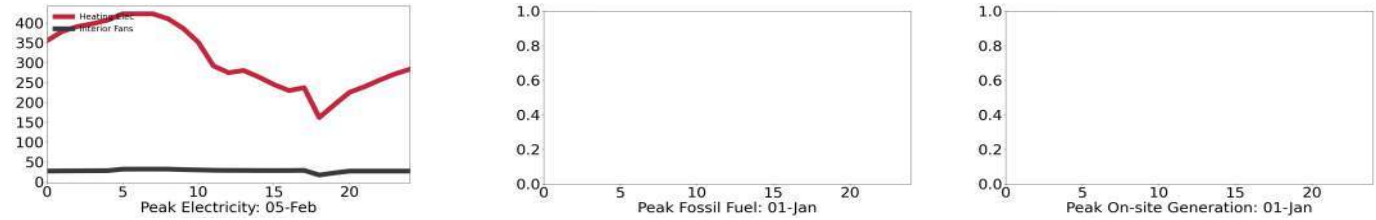
Site Energy Flows – Sankey Diagram



Annual Fuel Costs and Peak Demands

Fuels	Cost ($)	Peak Day	Peak Time	Peak Demand
Electricity	111,256.00	05-Feb	7:00	465.9 kW
Fossil Fuel	0.00	01-Jan	0:00	0.0 kBtu/h
Total	111,256.00	01-Jan	0:00	

Peak Energy Sources for Electricity (kW), Fossil Fuel (kBtu/h) and Onsite Power Generation (kW): Top 3 Contributors



Option#1 Energy Consumption HVAC					
Month	Space Heating (MBtu)	Space Cooling (MBtu)	Heat Rejection (MBtu)	Interior Central Fans (MBtu)	Total HVAC Energy
Jan 01-31	379.087	5.339	0.341	57.006	441.773
Feb 01-28	219.084	13.777	0.879	38.886	272.626
Mar 01-31	193.059	27.613	1.763	37.006	259.441
Apr 01-30	115.621	57.216	3.652	26.226	202.715
May 01-31	145.87	118.285	7.55	27.1	298.805
Jun 01-30	136.54	130.917	8.356	26.086	301.899
Jul 01-31	152.938	163.198	10.417	28.028	354.581
Aug 01-31	146.876	149.818	9.563	26.923	333.18
Sep 01-30	141.646	137.782	8.795	26.369	314.592
Oct 01-31	127.867	98.849	6.309	27.257	260.282
Nov 01-30	83.918	39.798	2.54	25.602	151.858
Dec 01-31	141.068	11.364	0.725	36.332	189.489
Summed total	1983.572	953.954	60.891	382.822	3,381.24

Option#1 Electricity ($0.105/kWh) blended rate		
Month	Net electricity usage [kWh]	Total net charges [$]
January	135,404.65	$ 14,217.49
February	85,161.14	$ 8,941.92
March	81,717.52	$ 8,580.34
April	65,119.75	$ 6,837.57
May	93,387.46	$ 9,805.68
June	94,054.85	$ 9,875.76
July	109,851.25	$ 11,534.38
August	103,328.22	$ 10,849.46
September	97,907.63	$ 10,280.30
October	82,214.91	$ 8,632.57
November	49,964.51	$ 5,246.27
December	61,467.63	$ 6,454.10
Total year	1,059,579.53	$ 111,255.84

Use global inputs for oversizing (yes/no):	no
Cooling (Sensible) Load Oversizing Factor:	10%
Cooling (Latent) Load Oversizing Factor:	10%
Heating Load Oversizing Factor:	10%

Date: **2023-12-06**

Loads reported below are non-coincident room- and zone-level loads

Zone group	Zone	Room	Template	Floor area	Volume	Cooling occupied setpoint	Sensible cooling load (without oversizing)			Cooling design load oversizing factor	Cooling design load with oversizing	Cooling supply air temperature	Cooling design airflow (sensible cooling maximum)			Max RH setpoint	Latent cooling load without oversizing	Design latent cooling load with oversizing	Cooling design load oversizing factor from (same for sens. & lat)
				(ft²)	(ft³)	(°F)	Month/time	(kBtu/h)	(Btu/h.ft²)		(kBtu/h)	(°F)	(cfm)	(ACH)	(cfm/ft²)	(%)	(kBtu/h)	(kBtu/h)	
DH-1	DH-1	29 DH -1 Pool area North Circula	SPACE: Corridor - All Other Corridors	1,853.3	53,109.4	82.0	Jun 14:30	70.72	38.16	1.10	77.79	55.0	2,633.7	2.98	1.42	60.0	3.15	3.46	1.1
		DH-1 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	10,647.6	106,238.4	82.0	Jun 10:30	56.88	5.34	1.10	62.57	55.0	2,118.4	1.20	0.20	55.0	344.65	379.11	1.1
		DH-1 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	82.0	Jun 10:30	21.56	2.02	1.10	23.71	55.0	802.8	0.32	0.08	60.0	10.10	11.11	1.1
		DH-1 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	82.0	Jun 11:30	27.38	2.57	1.10	30.12	55.0	1,019.8	0.41	0.10	60.0	10.53	11.58	1.1
DH-2	Dh-2	23 Spectator Area	SPACE: Audience Seating Area - Exercise Center	9,175.0	191,146.9	82.0	Jun 7:30	55.43	6.04	1.10	60.98	55.0	2,064.3	0.65	0.22	60.0	14.00	15.40	1.1
		30 Vestibule	SPACE: Corridor - All Other Corridors	251.6	9,596.6	82.0	Aug 17:30	20.41	81.11	1.10	22.45	55.0	759.9	4.75	3.02	60.0	0.70	0.77	1.1
		31 Vestibule	SPACE: Corridor - All Other Corridors	264.5	10,094.0	82.0	Sep 10:30	30.96	117.08	1.10	34.06	55.0	1,153.1	6.85	4.36	60.0	0.67	0.74	1.1
		32 DH-2 Pool Area Circulation	SPACE: Corridor - All Other Corridors	1,187.8	44,412.8	82.0	Jun 8:30	17.65	14.86	1.10	19.41	55.0	657.2	0.89	0.55	60.0	3.25	3.58	1.1
		DH-2 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	11,579.7	115,538.8	82.0	Jun 10:30	86.32	7.45	1.10	94.95	55.0	3,214.7	1.67	0.28	55.0	377.47	415.22	1.1
		DH-2 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	82.0	Aug 10:30	23.00	1.99	1.10	25.30	55.0	856.6	0.31	0.07	60.0	11.95	13.15	1.1
		DH-2 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	82.0	Jun 10:30	27.21	2.35	1.10	29.93	55.0	1,013.4	0.37	0.09	60.0	11.52	12.68	1.1

Zone group	Zone	Room	Template	Floor area	Volume	Heating occupied setpoint	Heating load (without oversizing)		Heating design load oversizing factor	Heating design load with oversizing	Heating supply air temperature	Heating design airflow (maximum)		Min RH setpoint	Humidification load
				(ft²)	(ft³)	(°F)	(kBtu/h)	(Btu/h.ft²)		(kBtu/h)	(°F)	(cfm)	(cfm/ft²)	(%)	(kBtu/h)
DH-1	DH-1	29 DH -1 Pool area North Circula	SPACE: Corridor - All Other Corridors	1,853.3	53,109.4	70.00	78.39	42.30	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		DH-1 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	10,647.6	106,238.4	70.00	32.84	3.08	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		DH-1 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	70.00	20.94	1.97	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		DH-1 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	70.00	27.45	2.58	0.00	0.00	90.0	0.0	0.00	0.0	0.00
DH-2	Dh-2	23 Spectator Area	SPACE: Audience Seating Area - Exercise Center	9,175.0	191,146.9	70.00	44.69	4.87	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		30 Vestibule	SPACE: Corridor - All Other Corridors	251.6	9,596.6	70.00	7.25	28.80	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		31 Vestibule	SPACE: Corridor - All Other Corridors	264.5	10,094.0	70.00	10.48	39.63	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		32 DH-2 Pool Area Circulation	SPACE: Corridor - All Other Corridors	1,187.8	44,412.8	70.00	17.28	14.55	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		DH-2 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	11,579.7	115,538.8	70.00	33.20	2.87	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		DH-2 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	70.00	19.40	1.68	0.00	0.00	90.0	0.0	0.00	0.0	0.00
		DH-2 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	70.00	25.35	2.19	0.00	0.00	90.0	0.0	0.00	0.0	0.00

Zone group	Zone	Room	Template	Floor area	Volume	Design occupancy	Required minimum ventilation airflow			
				(ft²)	(ft³)	(People)	(cfm)	(cfm/person)	(cfm/ft²)	(ACH)
DH-1	DH-1	29 DH -1 Pool area North Circula	SPACE: Corridor - All Other Corridors	1,853.3	53,109.4	0.0	111.2	0.0	0.06	0.13
		DH-1 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	10,647.6	106,238.4	25.0	1,138.9	45.6	0.11	0.64
		DH-1 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	0.0	0.0	0.0	0.00	0.00
		DH-1 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	0.0	0.0	0.0	0.00	0.00
DH-2	Dh-2	23 Spectator Area	SPACE: Audience Seating Area - Exercise Center	9,175.0	191,146.9	10.0	625.5	62.6	0.07	0.20
		30 Vestibule	SPACE: Corridor - All Other Corridors	251.6	9,596.6	0.0	15.1	0.0	0.06	0.09
		31 Vestibule	SPACE: Corridor - All Other Corridors	264.5	10,094.0	0.0	15.9	0.0	0.06	0.09
		32 DH-2 Pool Area Circulation	SPACE: Corridor - All Other Corridors	1,187.8	44,412.8	0.0	71.3	0.0	0.06	0.10
		DH-2 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	11,579.7	115,538.8	25.0	1,194.8	47.8	0.10	0.62
		DH-2 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	0.0	0.0	0.0	0.00	0.00
		DH-2 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	0.0	0.0	0.0	0.00	0.00

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Room-Zone Loads & Sizing Reports

Link to Report Guidance

Long Center Option1

IES VIRTUAL ENVIRONMENT

VE 2023

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Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Table of Contents reports are not influenced by system operation.

Project and Climate

Long Center Option1

IES VIRTUAL ENVIRONMENT
VE 2023

Model Data

Project file	Long Center Option1.mit
Source HVAC file	Natatorium_Option1_HVAC.asp
HVAC file snapshot	Vista\Long Center Option1 Rooms loads rev1.asp
Model floor area	34,959.5 ft²
Building conditioned floor area	34,959.5 ft²
Building conditioned volume	1,156,556.0 ft³
Number of conditioned rooms	11
Load analysis methodology	ASHRAE Heat Balance Method
Calculated	2023/12/06 16:02
Version No.	2023.2.1.0

Location Data

Location	St Pete-Clearwater, Florida
Latitude	27.91 N
Longitude	82.69 W
Altitude	9.8 ft
Time Zone	5.0 hours behind GMT

Design Weather Data

Source	ASHRAE design weather database
Monthly percentile:	
For heating loads design weather	99.60 %
For cooling loads design weather	0.40 %
Barometric pressure	29.9109 inHg
Air density	0.0749 lb/ft³
Air specific heat	0.2434 Btu/lb·°F
Density-specific heat product	0.0591 Btu/ft³·°F
Summer ground reflectance	0.2
Winter ground reflectance	0.2
Carbon dioxide (ambient)	400.00 ppm

Cooling Calculation Data

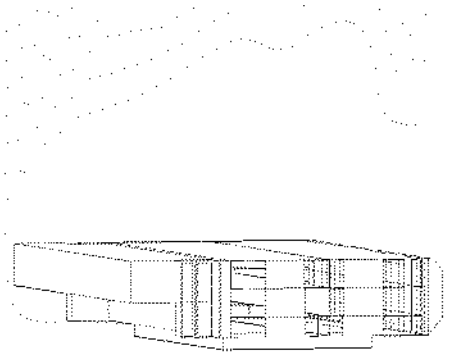
Results file	Long Center Option1 Rooms loads rev1.clg
Calculated	2023/12/06 16:02
Profile Month	May - Sep
Max outdoor temp. dry bulb	93.7 °F
Max outdoor temp. wet bulb	78.4 °F

Heating Calculation Data

Results file	Long Center Option1 Rooms loads rev1.htg
Calculated	2023/12/06 16:02
Profile Month	Jan
Outdoor winter design temp	42.1 °F

Project Loads Summary

	kBtu/h	Btu/h·ft²
Cooling loads:		
Coincident peak space load	391.21	11.19
Heating loads:		
Coincident peak space load	317.27	9.08



Project Cooling and Heating loads are coincident peak value for all conditioned spaces without oversizing.

Zone Loads Report
System: 05 a VAV - Reheat

Long Center Option1
DH-1

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	6 / 11:30
Outside Air (DBT/WBT/RH) °F and %RH	90.3 / 75.7 / 51.3

	Zone Sensible	Zone Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-3,913	-	-3,913	-0.3	-0.8
Roofs	1,385	-	1,385	0.1	0.3
Ground/Exposed Floors	-4,562	-	-4,562	-0.4	-0.9
External Doors	0	-	0	0.0	0.0
Windows Conduction	34,424	-	34,424	2.8	6.8
Skylights Conduction	0	-	0	0.0	0.0
Solar	103,955	-	103,955	8.3	20.5
Infiltration	5,971	5,826	11,797	0.9	2.3
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	75	-	75	0.0	0.0
Internal Floors	797	-	797	0.1	0.2
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	138,133	5,826	143,959	11.5	
Internal Gains					
Lights	3,162	-	3,162	0.3	0.6
People	17,750	27,250	45,000	3.6	8.9
Misc, Computers, Equip	1,265	313,755	315,020	25.2	62.1
Sub Total	22,177	341,005	363,182	29.1	
TOTAL	160,310	346,831	507,141	40.6	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	160,310
Latent cooling load (Btu/h):	346,831
Sensible heat ratio:	0.32
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Zone	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-21,014	-21,014	-1.7	13.2
Roofs	-8,635	-8,635	-0.7	5.4
Ground/Exposed Floors	-16,241	-16,241	-1.3	10.2
External Doors	0	0	0.0	0.0
Windows Conduction	-77,794	-77,794	-6.2	48.7
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-23,387	-23,387	-1.9	14.7
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	1,777	1,777	0.1	-1.1
Internal Floors	-14,327	-14,327	-1.1	9.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-159,621	-159,621	-12.8	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-159,621	-159,621	-12.8	100

HEATING SUMMARY

Sensible heating load (Btu/h):	159,621
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	15,437.1	6,260.1	40.6	0.25
Below Grade Walls	-	-	-	-
Windows[2]	6,260.1	6,260.1	100.0	0.48
Doors	-	-	-	-
Floors	6,979.8	-	-	0.09
Roofs[3]	12,392.2	-	-	0.02
COMBINED	34,809.1	6,260.1	18.0	0.14
Internal				
Ceilings	-	-	-	-
Floors	5,521.2	-	-	0.19
Partitions[4]	3,695.6	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Master Room Setpoint (design)	82.0	70.0
Master Room (actual)	82.0	70.0
Mean Radiant Temperature	179.7	163.5
Dry Resultant Temperature	178.9	164.7
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	20,626	24,967
Reheat Minimum (design)	20,626	20,626
Leakage at Design Flow	0	0
Ventilation (requirement)	20,626	20,626
Exhaust (requirement)	15,469	15,469
Infiltration	766	766

CHECKS

Number of People	25.00
ft²/Person	500.04
Average Ceiling Height (ft)	18.38
Btu/h/ft² - Cooling (sensible)	12.82
Btu/h/ft² - Heating	12.77
ft²/ton - Cooling (sensible)	935.76
ft²/ton - Heating	939.79
cfm/ft² - Cooling	1.65
cfm/ft² - Heating	2.00
% Outside Air - Cooling	100.00
% Outside Air - Heating	82.61
Outdoor Air cfm/ft²	1.65
Outdoor Air cfm/person	825.03

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Zone Loads reports are not influenced by system operation.

Zone Loads Report
System: 05 a VAV - Reheat

Long Center Option1
Dh-2

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	8 / 10:30
Outside Air (DBT/WBT/RH) °F and %RH	88.2 / 76.5 / 58.6

	Zone Sensible	Zone Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,069	-	-1,069	0.0	-0.2
Roofs	4,693	-	4,693	0.2	0.8
Ground/Exposed Floors	-6,480	-	-6,480	-0.3	-1.1
External Doors	0	-	0	0.0	0.0
Windows Conduction	9,305	-	9,305	0.4	1.6
Skylights Conduction	0	-	0	0.0	0.0
Solar	123,653	-	123,653	5.5	21.9
Infiltration	4,642	11,000	15,642	0.7	2.8
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-4,807	-	-4,807	-0.2	-0.9
Internal Floors	-2,436	-	-2,436	-0.1	-0.4
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	14	-	14	0.0	0.0
Sub Total	127,514	11,000	138,514	6.2	
Internal Gains					
Lights	38,467	-	38,467	1.7	6.8
People	17,750	27,250	45,000	2.0	8.0
Misc, Computers, Equip	1,163	341,222	342,385	15.2	60.7
Sub Total	57,380	368,472	425,852	19.0	
TOTAL	184,894	379,473	564,367	25.1	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	184,894
Latent cooling load (Btu/h):	379,473
Sensible heat ratio:	0.33
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Zone	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-18,277	-18,277	-0.8	16.2
Roofs	-9,424	-9,424	-0.4	8.3
Ground/Exposed Floors	-15,445	-15,445	-0.7	13.7
External Doors	0	0	0.0	0.0
Windows Conduction	-24,650	-24,650	-1.1	21.8
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-25,758	-25,758	-1.1	22.8
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	-502	-502	0.0	0.4
Internal Floors	-18,913	-18,913	-0.8	16.7
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-112,969	-112,969	-5.0	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-112,969	-112,969	-5.0	100

HEATING SUMMARY

Sensible heating load (Btu/h):	112,969
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	16,317.1	2,667.5	16.3	0.13
Below Grade Walls	-	-	-	-
Windows[2]	2,667.5	2,667.5	100.0	0.33
Doors	-	-	-	-
Floors	15,266.9	-	-	0.07
Roofs[3]	22,414.2	-	-	0.02
COMBINED	53,998.2	2,667.5	4.9	0.07
Internal				
Ceilings	22.0	-	-	0.05
Floors	7,169.6	-	-	0.19
Partitions[4]	6,690.0	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Master Room Setpoint (design)	82.0	70.0
Master Room (actual)	82.0	70.0
Mean Radiant Temperature	229.6	218.3
Dry Resultant Temperature	228.9	219.0
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	20,789	20,789
Reheat Minimum (design)	20,789	20,789
Leakage at Design Flow	0	0
Ventilation (requirement)	18,914	18,914
Exhaust (requirement)	14,453	14,453
Infiltration	843	843

CHECKS

Number of People	25.00
ft²/Person	531.34
Average Ceiling Height (ft)	24.67
Btu/h/ft² - Cooling (sensible)	13.92
Btu/h/ft² - Heating	8.50
ft²/ton - Cooling (sensible)	862.13
ft²/ton - Heating	1,411.02
cfm/ft² - Cooling	1.57
cfm/ft² - Heating	1.57
% Outside Air - Cooling	90.98
% Outside Air - Heating	90.98
Outdoor Air cfm/ft²	1.42
Outdoor Air cfm/person	756.58

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Room Loads Report

Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option1

29 DH -1 Pool area North Circulation
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 14:30
Outside Air (DBT/WBT/RH) °F and %RH	93.7 / 77.0 / 47.0

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	1,672	-	1,672	0.9	2.3
Roofs	-1,764	-	-1,764	-1.0	-2.5
Ground/Exposed Floors	-1,652	-	-1,652	-0.9	-2.3
External Doors	0	-	0	0.0	0.0
Windows Conduction	40,772	-	40,772	22.0	57.1
Skylights Conduction	0	-	0	0.0	0.0
Solar	37,866	-	37,866	20.4	53.0
Infiltration	1,100	720	1,820	1.0	2.5
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-11,699	-	-11,699	-6.3	-16.4
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	66,296	720	67,015	36.2	
Internal Gains					
Lights	3,162	-	3,162	1.7	4.4
People	0	0	0	0.0	0.0
Misc, Computers, Equip	1,265	0	1,265	0.7	1.8
Sub Total	4,427	0	4,427	2.4	
TOTAL	70,722	720	71,442	38.5	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	70,722
Latent cooling load (Btu/h):	720
Sensible heat ratio:	0.99
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-15,300	-15,300	-8.3	19.5
Roofs	-1,114	-1,114	-0.6	1.4
Ground/Exposed Floors	-9,221	-9,221	-5.0	11.8
External Doors	0	0	0.0	0.0
Windows Conduction	-67,040	-67,040	-36.2	85.5
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-2,704	-2,704	-1.5	3.4
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	16,989	16,989	9.2	-21.7
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-78,390	-78,390	-42.3	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-78,390	-78,390	-42.3	100

HEATING SUMMARY

Sensible heating load (Btu/h):	78,390
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	11,823.4	4,985.9	42.2	0.27
Below Grade Walls	-	-	-	-
Windows[2]	4,985.9	4,985.9	100.0	0.53
Doors	-	-	-	-
Floors	1,853.3	-	-	0.19
Roofs[3]	1,744.7	-	-	0.02
COMBINED	15,421.4	4,985.9	32.3	0.23
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	331.4	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	85.8	64.1
Dry Resultant Temperature	83.9	67.1
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	3,541	7,882
Reheat Minimum (design)	3,541	3,541
Leakage at Design Flow	0	0
Ventilation (requirement)	3,541	3,541
Exhaust (requirement)	1,770	1,770
Infiltration	89	89

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	35.37
Btu/h/ft² - Cooling (sensible)	38.16
Btu/h/ft² - Heating	42.30
ft²/ton - Cooling (sensible)	314.47
ft²/ton - Heating	283.71
cfm/ft² - Cooling	1.91
cfm/ft² - Heating	4.25
% Outside Air - Cooling	100.00
% Outside Air - Heating	44.92
Outdoor Air cfm/ft²	1.91
Outdoor Air cfm/person	-

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

Room Loads Report
Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option1
DH-1 Pool Area
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 10:30
Outside Air (DBT/WBT/RH) °F and %RH	88.0 / 74.9 / 54.4

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-131	-	-131	0.0	0.0
Roofs	0	-	0	0.0	0.0
Ground/Exposed Floors	-4,944	-	-4,944	-0.5	-1.2
External Doors	0	-	0	0.0	0.0
Windows Conduction	2,028	-	2,028	0.2	0.5
Skylights Conduction	0	-	0	0.0	0.0
Solar	47,625	-	47,625	4.5	11.9
Infiltration	912	1,949	2,861	0.3	0.7
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-4,516	-	-4,516	-0.4	-1.1
Internal Floors	-1,831	-	-1,831	-0.2	-0.5
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	39,144	1,949	41,093	3.9	
Internal Gains					
Lights	0	-	0	0.0	0.0
People	17,750	27,250	45,000	4.2	11.3
Misc, Computers, Equip	0	313,755	313,755	29.5	78.5
Sub Total	17,750	341,005	358,755	33.7	
TOTAL	56,894	342,954	399,848	37.6	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	56,894
Latent cooling load (Btu/h):	342,954
Sensible heat ratio:	0.14
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,019	-1,019	-0.1	3.1
Roofs	0	0	0.0	0.0
Ground/Exposed Floors	-7,020	-7,020	-0.7	21.4
External Doors	0	0	0.0	0.0
Windows Conduction	-4,359	-4,359	-0.4	13.3
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-5,408	-5,408	-0.5	16.5
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	-702	-702	-0.1	2.1
Internal Floors	-14,327	-14,327	-1.3	43.6
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-32,835	-32,835	-3.1	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-32,835	-32,835	-3.1	100

HEATING SUMMARY

Sensible heating load (Btu/h):	32,835
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	944.8	526.2	55.7	0.20
Below Grade Walls	-	-	-	-
Windows[2]	526.2	526.2	100.0	0.30
Doors	-	-	-	-
Floors	5,126.4	-	-	0.05
Roofs[3]	-	-	-	-
COMBINED	6,071.3	526.2	8.7	0.08
Internal				
Ceilings	-	-	-	-
Floors	5,521.2	-	-	0.19
Partitions[4]	140.0	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	84.3	67.5
Dry Resultant Temperature	83.2	68.7
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	7,083	7,083
Reheat Minimum (design)	7,083	7,083
Leakage at Design Flow	0	0
Ventilation (requirement)	7,083	7,083
Exhaust (requirement)	6,197	6,197
Infiltration	177	177

CHECKS

Number of People	25.00
ft²/Person	425.90
Average Ceiling Height (ft)	9.98
Btu/h/ft² - Cooling (sensible)	5.34
Btu/h/ft² - Heating	3.08
ft²/ton - Cooling (sensible)	2,245.78
ft²/ton - Heating	3,891.30
cfm/ft² - Cooling	0.67
cfm/ft² - Heating	0.67
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	0.67
Outdoor Air cfm/person	283.30

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Room Loads Report
Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option1
DH-1 Pool Area (upper 1)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 10:30
Outside Air (DBT/WBT/RH) °F and %RH	88.0 / 74.9 / 54.4

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-166	-	-166	-	-0.7
Roofs	0	-	0	-	0.0
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	1,851	-	1,851	-	8.1
Skylights Conduction	0	-	0	-	0.0
Solar	11,521	-	11,521	-	50.3
Infiltration	1,288	1,340	2,628	-	11.5
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	7,075	-	7,075	-	30.9
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	21,570	1,340	22,910	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	21,570	1,340	22,910	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	21,570
Latent cooling load (Btu/h):	1,340
Sensible heat ratio:	0.94
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,335	-2,335	-	-
Roofs	0	0	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-3,214	-3,214	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-7,638	-7,638	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-7,756	-7,756	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-20,942	-20,942	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-20,942	-20,942	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	20,942
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,334.4	376.7	28.2	0.15
Below Grade Walls	-	-	-	-
Windows[2]	376.7	376.7	100.0	0.30
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	-	-	-	-
COMBINED	1,334.4	376.7	28.2	0.15
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	3,206.4	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.4	68.0
Dry Resultant Temperature	82.7	69.0
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,001	5,001
Reheat Minimum (design)	5,001	5,001
Leakage at Design Flow	0	0
Ventilation (requirement)	5,001	5,001
Exhaust (requirement)	3,751	3,751
Infiltration	250	250

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

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Room Loads Report
Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option1
DH-1 Pool Area (upper 2)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 11:30
Outside Air (DBT/WBT/RH) °F and %RH	90.3 / 75.7 / 51.3

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	55	-	55	-	0.2
Roofs	3,401	-	3,401	-	11.7
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	2,022	-	2,022	-	7.0
Skylights Conduction	0	-	0	-	0.0
Solar	16,719	-	16,719	-	57.7
Infiltration	1,950	1,576	3,526	-	12.2
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	3,237	-	3,237	-	11.2
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	27,383	1,576	28,959	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	27,383	1,576	28,959	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	27,383
Latent cooling load (Btu/h):	1,576
Sensible heat ratio:	0.95
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,360	-2,360	-	-
Roofs	-7,521	-7,521	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-3,181	-3,181	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-7,638	-7,638	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-6,754	-6,754	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-27,454	-27,454	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-27,454	-27,454	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	27,454
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,334.4	371.3	27.8	0.14
Below Grade Walls	-	-	-	-
Windows[2]	371.3	371.3	100.0	0.30
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	10,647.6	-	-	0.02
COMBINED	11,982.0	371.3	3.1	0.04
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	349.2	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.3	68.1
Dry Resultant Temperature	82.6	69.1
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,001	5,001
Reheat Minimum (design)	5,001	5,001
Leakage at Design Flow	0	0
Ventilation (requirement)	5,001	5,001
Exhaust (requirement)	3,751	3,751
Infiltration	250	250

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option1
30 Vestibule
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	8 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 77.7 / 53.8

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,967	-	-1,967	-7.8	-9.5
Roofs	-1,177	-	-1,177	-4.7	-5.7
Ground/Exposed Floors	-1,659	-	-1,659	-6.6	-8.0
External Doors	0	-	0	0.0	0.0
Windows Conduction	1,887	-	1,887	7.5	9.1
Skylights Conduction	0	-	0	0.0	0.0
Solar	25,899	-	25,899	103.0	125.5
Infiltration	178	227	405	1.6	2.0
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-3,356	-	-3,356	-13.3	-16.3
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	19,805	227	20,032	79.6	
Internal Gains					
Lights	429	-	429	1.7	2.1
People	0	0	0	0.0	0.0
Misc, Computers, Equip	172	0	172	0.7	0.8
Sub Total	601	0	601	2.4	
TOTAL	20,406	227	20,633	82.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	20,406
Latent cooling load (Btu/h):	227
Sensible heat ratio:	0.99
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,572	-2,572	-10.2	35.5
Roofs	-173	-173	-0.7	2.4
Ground/Exposed Floors	-1,312	-1,312	-5.2	18.1
External Doors	0	0	0.0	0.0
Windows Conduction	-3,033	-3,033	-12.1	41.9
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-489	-489	-1.9	6.7
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	332	332	1.3	-4.6
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-7,246	-7,246	-28.8	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-7,246	-7,246	-28.8	100

HEATING SUMMARY

Sensible heating load (Btu/h):	7,246
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,462.0	366.6	25.1	0.14
Below Grade Walls	-	-	-	-
Windows[2]	366.6	366.6	100.0	0.30
Doors	-	-	-	-
Floors	251.6	-	-	0.19
Roofs[3]	251.4	-	-	0.02
COMBINED	1,965.0	366.6	18.7	0.13
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	1,192.2	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	89.1	66.8
Dry Resultant Temperature	85.5	68.4
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	760	760
Reheat Minimum (design)	760	760
Leakage at Design Flow	0	0
Ventilation (requirement)	19	19
Exhaust (requirement)	-	-
Infiltration	16	16

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	38.15
Btu/h/ft² - Cooling (sensible)	81.11
Btu/h/ft² - Heating	28.80
ft²/ton - Cooling (sensible)	147.94
ft²/ton - Heating	416.62
cfm/ft² - Cooling	3.02
cfm/ft² - Heating	3.02
% Outside Air - Cooling	2.48
% Outside Air - Heating	2.48
Outdoor Air cfm/ft²	0.08
Outdoor Air cfm/person	-

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option1
31 Vestibule
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	9 / 10:30
Outside Air (DBT/WBT/RH) °F and %RH	87.7 / 75.3 / 56.6

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,035	-	-1,035	-3.9	-3.3
Roofs	-2,538	-	-2,538	-9.6	-8.2
Ground/Exposed Floors	-4,055	-	-4,055	-15.3	-13.0
External Doors	0	-	0	0.0	0.0
Windows Conduction	1,210	-	1,210	4.6	3.9
Skylights Conduction	0	-	0	0.0	0.0
Solar	43,870	-	43,870	165.9	141.1
Infiltration	83	130	213	0.8	0.7
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-7,202	-	-7,202	-27.2	-23.2
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	30,333	130	30,463	115.2	
Internal Gains					
Lights	451	-	451	1.7	1.5
People	0	0	0	0.0	0.0
Misc, Computers, Equip	181	0	181	0.7	0.6
Sub Total	632	0	632	2.4	
TOTAL	30,964	130	31,094	117.6	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	30,964
Latent cooling load (Btu/h):	130
Sensible heat ratio:	1.00
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-731	-731	-2.8	7.0
Roofs	-174	-174	-0.7	1.7
Ground/Exposed Floors	-1,311	-1,311	-5.0	12.5
External Doors	0	0	0.0	0.0
Windows Conduction	-8,772	-8,772	-33.2	83.7
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-514	-514	-1.9	4.9
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	1,022	1,022	3.9	-9.8
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-10,480	-10,480	-39.6	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-10,480	-10,480	-39.6	100

HEATING SUMMARY

Sensible heating load (Btu/h):	10,480
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,453.8	816.5	56.2	0.27
Below Grade Walls	-	-	-	-
Windows[2]	816.5	816.5	100.0	0.41
Doors	-	-	-	-
Floors	264.5	-	-	0.19
Roofs[3]	264.5	-	-	0.02
COMBINED	1,982.8	816.5	41.2	0.23
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	1,061.3	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	93.7	64.9
Dry Resultant Temperature	87.9	67.4
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	1,153	1,153
Reheat Minimum (design)	1,153	1,153
Leakage at Design Flow	0	0
Ventilation (requirement)	20	20
Exhaust (requirement)	-	-
Infiltration	17	17

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	38.17
Btu/h/ft² - Cooling (sensible)	117.08
Btu/h/ft² - Heating	39.63
ft²/ton - Cooling (sensible)	102.49
ft²/ton - Heating	302.83
cfm/ft² - Cooling	4.36
cfm/ft² - Heating	4.36
% Outside Air - Cooling	1.72
% Outside Air - Heating	1.72
Outdoor Air cfm/ft²	0.07
Outdoor Air cfm/person	-

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option1
32 DH-2 Pool Area Circulation
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 8:30
Outside Air (DBT/WBT/RH) °F and %RH	82.6 / 72.9 / 63.1

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-473	-	-473	-0.4	-2.6
Roofs	924	-	924	0.8	5.2
Ground/Exposed Floors	0	-	0	0.0	0.0
External Doors	0	-	0	0.0	0.0
Windows Conduction	-9	-	-9	0.0	-0.1
Skylights Conduction	0	-	0	0.0	0.0
Solar	13,576	-	13,576	11.4	75.8
Infiltration	-60	258	198	0.2	1.1
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	849	-	849	0.7	4.7
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	8	-	8	0.0	0.0
Ceilings	10	-	10	0.0	0.1
Sub Total	14,826	258	15,084	12.7	
Internal Gains					
Lights	2,026	-	2,026	1.7	11.3
People	0	0	0	0.0	0.0
Misc, Computers, Equip	811	0	811	0.7	4.5
Sub Total	2,837	0	2,837	2.4	
TOTAL	17,663	258	17,921	15.1	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	17,663
Latent cooling load (Btu/h):	258
Sensible heat ratio:	0.99
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-8,861	-8,861	-7.5	51.3
Roofs	-806	-806	-0.7	4.7
Ground/Exposed Floors	-6,690	-6,690	-5.6	38.7
External Doors	0	0	0.0	0.0
Windows Conduction	-417	-417	-0.4	2.4
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-2,261	-2,261	-1.9	13.1
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	1,752	1,752	1.5	-10.1
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-17,283	-17,283	-14.6	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-17,283	-17,283	-14.6	100

HEATING SUMMARY

Sensible heating load (Btu/h):	17,283
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	3,735.4	28.7	0.8	0.09
Below Grade Walls	-	-	-	-
Windows[2]	28.7	28.7	100.0	0.53
Doors	-	-	-	-
Floors	1,187.8	-	-	0.19
Roofs[3]	1,143.6	-	-	0.02
COMBINED	6,066.8	28.7	0.5	0.10
Internal				
Ceilings	44.1	-	-	0.05
Floors	-	-	-	-
Partitions[4]	2,305.0	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.5	68.0
Dry Resultant Temperature	82.7	69.0
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	2,221	2,221
Reheat Minimum (design)	2,221	2,221
Leakage at Design Flow	0	0
Ventilation (requirement)	2,221	2,221
Exhaust (requirement)	1,480	1,480
Infiltration	74	74

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	37.39
Btu/h/ft² - Cooling (sensible)	14.87
Btu/h/ft² - Heating	14.55
ft²/ton - Cooling (sensible)	806.93
ft²/ton - Heating	824.71
cfm/ft² - Cooling	1.87
cfm/ft² - Heating	1.87
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	1.87
Outdoor Air cfm/person	-

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option1
DH-2 Pool Area
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 10:30
Outside Air (DBT/WBT/RH) °F and %RH	88.0 / 74.9 / 54.4

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-100	-	-100	0.0	0.0
Roofs	0	-	0	0.0	0.0
Ground/Exposed Floors	-3,852	-	-3,852	-0.3	-0.8
External Doors	0	-	0	0.0	0.0
Windows Conduction	2,251	-	2,251	0.2	0.5
Skylights Conduction	0	-	0	0.0	0.0
Solar	48,183	-	48,183	4.2	10.5
Infiltration	992	2,119	3,111	0.3	0.7
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-12,140	-	-12,140	-1.0	-2.7
Internal Floors	-2,329	-	-2,329	-0.2	-0.5
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	33,005	2,119	35,124	3.0	
Internal Gains					
Lights	35,560	-	35,560	3.1	7.8
People	17,750	27,250	45,000	3.9	9.8
Misc, Computers, Equip	0	341,222	341,222	29.5	74.7
Sub Total	53,310	368,472	421,783	36.4	
TOTAL	86,315	370,592	456,907	39.5	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	86,315
Latent cooling load (Btu/h):	370,592
Sensible heat ratio:	0.19
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,063	-1,063	-0.1	3.2
Roofs	0	0	0.0	0.0
Ground/Exposed Floors	-6,133	-6,133	-0.5	18.5
External Doors	0	0	0.0	0.0
Windows Conduction	-4,977	-4,977	-0.4	15.0
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-5,882	-5,882	-0.5	17.7
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	3,761	3,761	0.3	-11.3
Internal Floors	-18,913	-18,913	-1.6	57.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-33,207	-33,207	-2.9	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-33,207	-33,207	-2.9	100

HEATING SUMMARY

Sensible heating load (Btu/h):	33,207
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,027.6	594.8	57.9	0.21
Below Grade Walls	-	-	-	-
Windows[2]	594.8	594.8	100.0	0.30
Doors	-	-	-	-
Floors	4,432.2	-	-	0.05
Roofs[3]	-	-	-	-
COMBINED	5,459.8	594.8	10.9	0.08
Internal				
Ceilings	-	-	-	-
Floors	7,147.5	-	-	0.19
Partitions[4]	344.5	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	84.8	67.9
Dry Resultant Temperature	83.4	68.9
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,777	5,777
Reheat Minimum (design)	5,777	5,777
Leakage at Design Flow	0	0
Ventilation (requirement)	5,777	5,777
Exhaust (requirement)	4,814	4,814
Infiltration	193	193

CHECKS

Number of People	25.00
ft²/Person	463.19
Average Ceiling Height (ft)	9.98
Btu/h/ft² - Cooling (sensible)	7.45
Btu/h/ft² - Heating	2.87
ft²/ton - Cooling (sensible)	1,609.87
ft²/ton - Heating	4,184.57
cfm/ft² - Cooling	0.50
cfm/ft² - Heating	0.50
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	0.50
Outdoor Air cfm/person	231.08

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option1
DH-2 Pool Area (upper 1)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	8 / 10:30
Outside Air (DBT/WBT/RH) °F and %RH	88.2 / 76.5 / 58.6

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-87	-	-87	-	-0.3
Roofs	0	-	0	-	0.0
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	2,193	-	2,193	-	8.4
Skylights Conduction	0	-	0	-	0.0
Solar	11,373	-	11,373	-	43.4
Infiltration	1,497	3,197	4,693	-	17.9
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	8,018	-	8,018	-	30.6
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	22,994	3,197	26,191	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	22,994	3,197	26,191	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	22,994
Latent cooling load (Btu/h):	3,197
Sensible heat ratio:	0.88
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,511	-2,511	-	-
Roofs	0	0	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-3,758	-3,758	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-8,306	-8,306	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-4,826	-4,826	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-19,401	-19,401	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-19,401	-19,401	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	19,401
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,451.2	434.7	30.0	0.15
Below Grade Walls	-	-	-	-
Windows[2]	434.7	434.7	100.0	0.30
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	-	-	-	-
COMBINED	1,451.2	434.7	30.0	0.15
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	3,412.3	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.4	68.6
Dry Resultant Temperature	82.7	69.3
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,439	5,439
Reheat Minimum (design)	5,439	5,439
Leakage at Design Flow	0	0
Ventilation (requirement)	5,439	5,439
Exhaust (requirement)	4,079	4,079
Infiltration	272	272

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option1
DH-2 Pool Area (upper 2)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 10:30
Outside Air (DBT/WBT/RH) °F and %RH	88.0 / 74.9 / 54.4

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	11	-	11	-	0.0
Roofs	6,567	-	6,567	-	22.9
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	2,131	-	2,131	-	7.4
Skylights Conduction	0	-	0	-	0.0
Solar	15,280	-	15,280	-	53.3
Infiltration	1,401	1,457	2,858	-	10.0
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	1,817	-	1,817	-	6.3
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	27,207	1,457	28,664	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	27,207	1,457	28,664	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	27,207
Latent cooling load (Btu/h):	1,457
Sensible heat ratio:	0.95
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,540	-2,540	-	-
Roofs	-8,271	-8,271	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-3,693	-3,693	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-8,306	-8,306	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-2,542	-2,542	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-25,352	-25,352	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-25,352	-25,352	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	25,352
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,451.2	426.3	29.4	0.15
Below Grade Walls	-	-	-	-
Windows[2]	426.3	426.3	100.0	0.30
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	11,579.7	-	-	0.02
COMBINED	13,030.9	426.3	3.3	0.04
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	471.9	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.2	68.7
Dry Resultant Temperature	82.6	69.3
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,439	5,439
Reheat Minimum (design)	5,439	5,439
Leakage at Design Flow	0	0
Ventilation (requirement)	5,439	5,439
Exhaust (requirement)	4,079	4,079
Infiltration	272	272

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

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APPENDIX D

Energy Model Output Report

Project:	Long Center Natatorium - Option2
Address:	1501 Belcher Rd. Clearwater FL 33765
Climate File:	USA_FL_St.Petersburg-Clearwater.Intl.AP.722116_TMY3.epw
Simulation:	Natatorium Option2_1206.aps

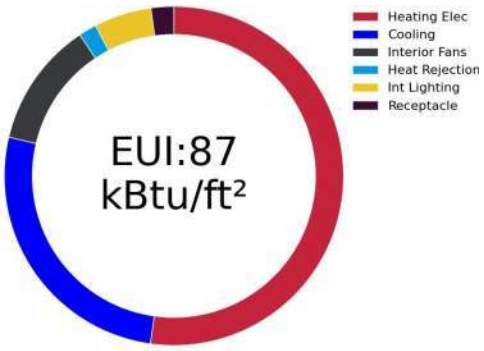
Design Team:	Wannemacher Jensen Architects
Energy Analyst:	REAL Building Conultants LLC
Owner:	City of Clearwater
Conditioned Area (ft²):	34959.4935

Annual Energy Consumption (kBtu/ft²/year) & CO2 KgCO2/ft²/yr

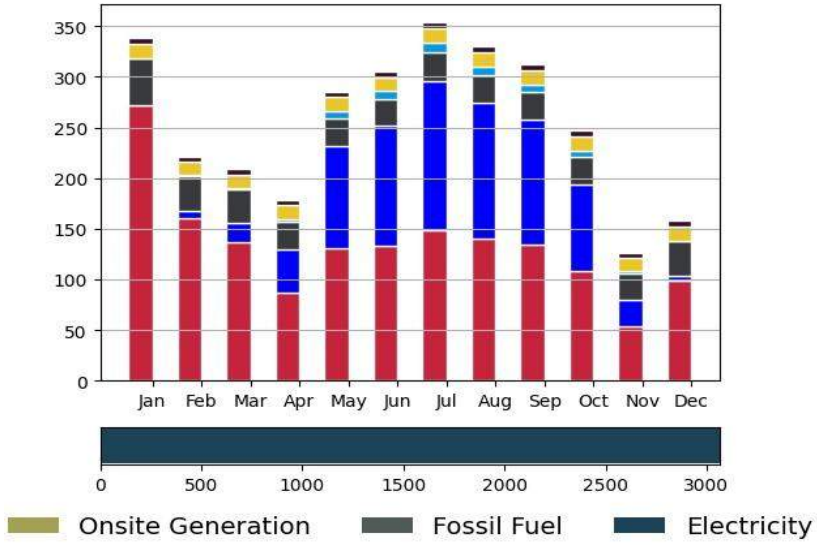
Energy End Use	Site Energy	Source Energy	CO2 Emissions
Heating Fossil Fuel	0.0	0.0	0.0
Heating Electricity	45.8	144.3	8.1
Space Cooling	23.2	73.1	4.1
Fans Interior	10.5	33.0	1.8
Heat Rejection	1.5	4.7	0.3
Pumps	0.0	0.0	0.0
DHW Fossil Fuel	0.0	0.0	0.0
DHW Electricity	0.0	0.0	0.0
Interior Lighting	4.8	15.0	0.8
Exterior Lighting	0.0	0.0	0.0
Receptacle	1.9	6.1	0.3
Data Center	0.0	0.0	0.0
Cooking Fossil Fuel	0.0	0.0	0.0
Cooking Electricity	0.0	0.0	0.0
Elevators & Escalators	0.0	0.0	0.0
Refrigeration	0.0	0.0	0.0
Process	0.0	0.0	0.0
TOTAL (ex renewables)	**87**	**276**	**15**

Project Viewer - 3D Model

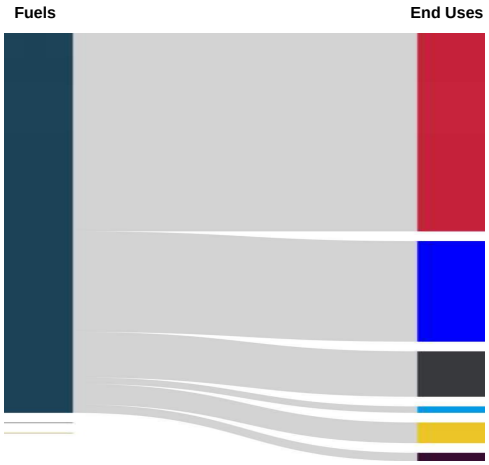
Site Energy Use Intensity



Site Energy Dashboard (MBtu)



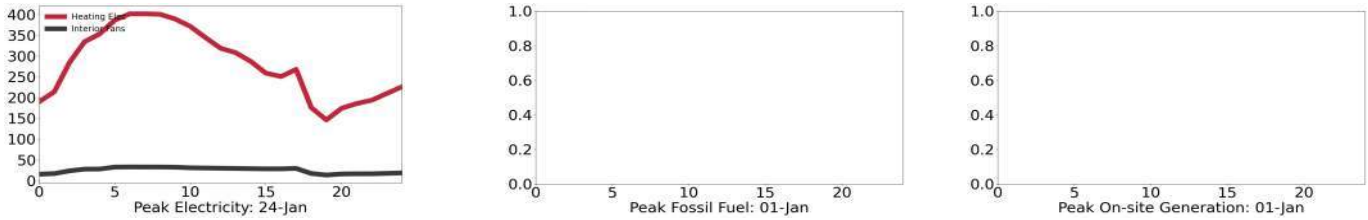
Site Energy Flows – Sankey Diagram



Annual Fuel Costs and Peak Demands

Fuels	Cost (£)	Peak Day	Peak Time	Peak Demand
Electricity	53,900.00	24-Jan	8:00	446.6 kW
Fossil Fuel	0.00	01-Jan	0:00	0.0 kBtu/h
Total	53,900.00	01-Jan	0:00	

Peak Energy Sources for Electricity (kW), Fossil Fuel (kBtu/h) and Onsite Power Generation (kW): Top 3 Contributors



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Option#2 Energy Consumption HVAC					
Month	Space Heating (MBtu)	Space Cooling (MBtu)	Heat Rejection (MBtu)	Interior Central Fans (MBtu)	Total HVAC Energy
Jan 01-31	271.63	0.17	0.01	46.76	318.57
Feb 01-28	160.31	7.70	0.49	34.56	203.06
Mar 01-31	136.45	19.14	1.22	33.17	189.98
Apr 01-30	86.62	43.11	2.75	26.64	159.11
May 01-31	130.46	101.32	6.47	27.45	265.69
Jun 01-30	132.97	118.73	7.58	26.65	285.93
Jul 01-31	148.18	147.34	9.41	28.68	333.60
Aug 01-31	140.20	133.98	8.55	27.55	310.27
Sep 01-30	134.34	123.41	7.88	26.95	292.57
Oct 01-31	108.49	84.81	5.41	27.80	226.51
Nov 01-30	53.22	26.84	1.71	26.05	107.83
Dec 01-31	98.67	5.02	0.32	33.96	137.96
Summed total	1,601.52	811.55	51.80	366.19	2,831.07

Option#2 Electricity ($0.105/kWh) blended rate		
Month	Net electricity usage [kWh]	Total net charges [$]
January	99,295.70	$ 10,426.05
February	64,772.67	$ 6,801.13
March	61,360.73	$ 6,442.88
April	52,340.30	$ 5,495.73
May	83,683.48	$ 8,786.77
June	89,373.98	$ 9,384.27
July	103,702.98	$ 10,888.81
August	96,613.71	$ 10,144.44
September	91,453.55	$ 9,602.62
October	72,317.91	$ 7,593.38
November	37,059.60	$ 3,891.26
December	46,366.75	$ 4,868.51
Total year	898,341.38	$ 94,325.85

Use global inputs for oversizing (yes/no):	no
Cooling (Sensible) Load Oversizing Factor:	10%
Cooling (Latent) Load Oversizing Factor:	10%
Heating Load Oversizing Factor:	10%

Date: **2023-12-06**

Loads reported below are non-coincident room- and zone-level loads

Zone group	Zone	Room	Template	Floor area	Volume	Cooling occupied setpoint	Sensible cooling load (without oversizing)			Cooling design load oversizing factor	Cooling design load with oversizing	Cooling supply air temperature	Cooling design airflow (sensible cooling maximum)			Max RH setpoint	Latent cooling load without oversizing	Design latent cooling load with oversizing	Cooling design load oversizing factor from (same for sens. & lat)
				(ft²)	(ft³)	(°F)	Month/time	(kBtu/h)	(Btu/h.ft²)		(kBtu/h)	(°F)	(cfm)	(ACH)	(cfm/ft²)	(%)	(kBtu/h)	(kBtu/h)	
DH-1	DH-1	29 DH -1 Pool area North Circula	SPACE: Corridor - All Other Corridors	1,853.3	53,109.4	82.0	Jun 15:30	74.80	40.36	1.10	82.28	55.0	2,785.7	3.15	1.50	60.0	3.13	3.44	1.1
		DH-1 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	10,647.6	106,238.4	82.0	Jun 17:30	62.96	5.91	1.10	69.26	55.0	2,344.8	1.32	0.22	55.0	344.65	379.11	1.1
		DH-1 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	82.0	Jun 17:30	26.05	2.45	1.10	28.65	55.0	970.1	0.39	0.09	60.0	9.86	10.84	1.1
		DH-1 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	82.0	Jun 17:30	34.95	3.28	1.10	38.44	55.0	1,301.5	0.52	0.12	60.0	10.62	11.68	1.1
DH-2	Dh-2	23 Spectator Area	SPACE: Audience Seating Area - Exercise Center	9,175.0	191,146.9	82.0	Sep 17:30	53.81	5.86	1.10	59.19	55.0	2,003.7	0.63	0.22	60.0	14.00	15.40	1.1
		30 Vestibule	SPACE: Corridor - All Other Corridors	251.6	9,596.6	82.0	Jul 7:30	3.30	13.13	1.00	3.30	55.0	111.8	0.70	0.44	60.0	0.70	0.70	1.1
		31 Vestibule	SPACE: Corridor - All Other Corridors	264.5	10,094.0	82.0	Sep 11:30	15.42	58.29	1.00	15.42	55.0	521.9	3.10	1.97	60.0	0.74	0.74	1.1
		32 DH-2 Pool Area Circulation	SPACE: Corridor - All Other Corridors	1,187.8	44,412.8	82.0	Jun 17:30	21.39	18.01	1.00	21.39	55.0	724.1	0.98	0.61	60.0	3.25	3.25	1.1
		DH-2 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	11,579.7	115,538.8	82.0	Aug 17:30	80.45	6.95	1.00	80.45	55.0	2,723.8	1.41	0.24	55.0	377.47	377.47	1.1
		DH-2 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	82.0	Aug 16:30	22.24	1.92	1.00	22.24	55.0	753.0	0.28	0.07	60.0	11.95	11.95	1.1
		DH-2 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	82.0	Jun 17:30	27.90	2.41	1.00	27.90	55.0	944.4	0.35	0.08	60.0	11.50	11.50	1.1

Zone group	Zone	Room	Template	Floor area	Volume	Heating occupied setpoint	Heating load (without oversizing)		Heating design load oversizing factor	Heating design load with oversizing	Heating supply air temperature	Heating design airflow (maximum)		Min RH setpoint	Humidification load
				(ft²)	(ft³)	(°F)	(kBtu/h)	(Btu/h.ft²)		(kBtu/h)	(°F)	(cfm)	(cfm/ft²)	(%)	(kBtu/h)
DH-1	DH-1	29 DH -1 Pool area North Circula	SPACE: Corridor - All Other Corridors	1,853.3	53,109.4	70.00	79.57	42.93	1.10	87.53	90.0	4,000.4	2.16	0.0	0.00
		DH-1 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	10,647.6	106,238.4	70.00	34.54	3.24	1.10	37.99	90.0	1,736.2	0.16	0.0	0.00
		DH-1 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	70.00	22.45	2.11	1.10	24.70	90.0	1,128.7	0.11	0.0	0.00
		DH-1 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	70.00	30.45	2.86	1.10	33.50	90.0	1,530.9	0.14	0.0	0.00
DH-2	Dh-2	23 Spectator Area	SPACE: Audience Seating Area - Exercise Center	9,175.0	191,146.9	70.00	44.60	4.86	1.10	49.06	90.0	2,242.0	0.24	0.0	0.00
		30 Vestibule	SPACE: Corridor - All Other Corridors	251.6	9,596.6	70.00	5.43	21.60	1.00	5.43	90.0	248.4	0.99	0.0	0.00
		31 Vestibule	SPACE: Corridor - All Other Corridors	264.5	10,094.0	70.00	8.66	32.74	1.00	8.66	90.0	395.7	1.50	0.0	0.00
		32 DH-2 Pool Area Circulation	SPACE: Corridor - All Other Corridors	1,187.8	44,412.8	70.00	18.25	15.37	1.00	18.25	90.0	834.1	0.70	0.0	0.00
		DH-2 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	11,579.7	115,538.8	70.00	33.53	2.90	1.00	33.53	90.0	1,532.2	0.13	0.0	0.00
		DH-2 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	70.00	20.86	1.80	1.00	20.86	90.0	953.6	0.08	0.0	0.00
		DH-2 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	70.00	27.58	2.38	1.00	27.58	90.0	1,260.5	0.11	0.0	0.00

Zone group	Zone	Room	Template	Floor area	Volume	Design occupancy	Required minimum ventilation airflow			
				(ft²)	(ft³)	(People)	(cfm)	(cfm/person)	(cfm/ft²)	(ACH)
DH-1	DH-1	29 DH -1 Pool area North Circula	SPACE: Corridor - All Other Corridors	1,853.3	53,109.4	0.0	111.2	0.0	0.06	0.13
		DH-1 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	10,647.6	106,238.4	25.0	1,138.9	45.6	0.11	0.64
		DH-1 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	0.0	0.0	0.0	0.00	0.00
		DH-1 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	10,647.6	150,037.4	0.0	0.0	0.0	0.00	0.00
DH-2	Dh-2	23 Spectator Area	SPACE: Audience Seating Area - Exercise Center	9,175.0	191,146.9	10.0	625.5	62.6	0.07	0.20
		30 Vestibule	SPACE: Corridor - All Other Corridors	251.6	9,596.6	0.0	15.1	0.0	0.06	0.09
		31 Vestibule	SPACE: Corridor - All Other Corridors	264.5	10,094.0	0.0	15.9	0.0	0.06	0.09
		32 DH-2 Pool Area Circulation	SPACE: Corridor - All Other Corridors	1,187.8	44,412.8	0.0	71.3	0.0	0.06	0.10
		DH-2 Pool Area	SPACE: Gymnasium/ Fitness center - Exercise area	11,579.7	115,538.8	25.0	1,194.8	47.8	0.10	0.62
		DH-2 Pool Area (upper 1)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	0.0	0.0	0.0	0.00	0.00
		DH-2 Pool Area (upper 2)	SPACE: Corridor - All Other Corridors	11,579.7	163,172.2	0.0	0.0	0.0	0.00	0.00

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Room-Zone Loads & Sizing Reports

Link to Report Guidance

Long Center Option2

IES VIRTUAL ENVIRONMENT

VE 2023

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Project and Climate

Long Center Option2

IES VIRTUAL ENVIRONMENT
VE 2023

Model Data

Project file	Long Center Option2.mit
Source HVAC file	Natatorium_Option2_HVAC.asp
HVAC file snapshot	Vista\Long Center Option2rev1 rooms loads.asp
Model floor area	34,959.5 ft²
Building conditioned floor area	34,959.5 ft²
Building conditioned volume	1,156,556.0 ft³
Number of conditioned rooms	11
Load analysis methodology	ASHRAE Heat Balance Method
Calculated	2023/12/06 10:06
Version No.	2023.2.1.0

Location Data

Location	St Pete-Clearwater, Florida
Latitude	27.91 N
Longitude	82.69 W
Altitude	9.8 ft
Time Zone	5.0 hours behind GMT

Design Weather Data

Source	ASHRAE design weather database
Monthly percentile:	
For heating loads design weather	99.60 %
For cooling loads design weather	0.40 %
Barometric pressure	29.9109 inHg
Air density	0.0749 lb/ft³
Air specific heat	0.2434 Btu/lb·°F
Density-specific heat product	0.0591 Btu/ft³·°F
Summer ground reflectance	0.2
Winter ground reflectance	0.2
Carbon dioxide (ambient)	400.00 ppm

Cooling Calculation Data

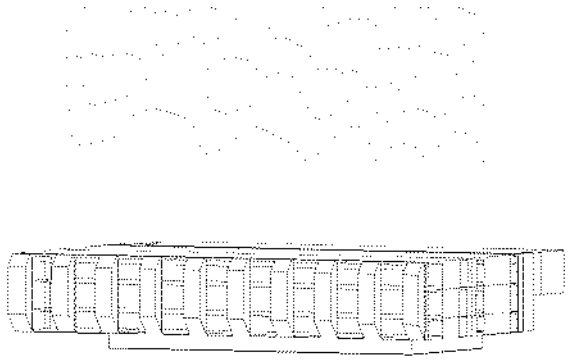
Results file	Long Center Option2rev1 rooms loads.clg
Calculated	2023/12/06 10:06
Profile Month	May - Sep
Max outdoor temp. dry bulb	93.7 °F
Max outdoor temp. wet bulb	78.4 °F

Heating Calculation Data

Results file	Long Center Option2rev1 rooms loads.htg
Calculated	2023/12/06 10:06
Profile Month	Jan
Outdoor winter design temp	42.1 °F

Project Loads Summary

	kBtu/h	Btu/h·ft²
Cooling loads:		
Coincident peak space load	404.28	11.56
Heating loads:		
Coincident peak space load	325.92	9.32



Project Cooling and Heating loads are coincident peak value for all conditioned spaces without oversizing.

Zone Loads Report
System: 05 a VAV - Reheat

Long Center Option2
DH-1

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	6 / 16:30
Outside Air (DBT/WBT/RH) °F and %RH	92.8 / 76.7 / 48.0

	Zone Sensible	Zone Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	8,161	-	8,161	0.7	1.5
Roofs	1,004	-	1,004	0.1	0.2
Ground/Exposed Floors	-7,333	-	-7,333	-0.6	-1.4
External Doors	0	-	0	0.0	0.0
Windows Conduction	42,829	-	42,829	3.4	7.9
Skylights Conduction	0	-	0	0.0	0.0
Solar	122,109	-	122,109	9.8	22.6
Infiltration	9,454	7,198	16,652	1.3	3.1
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-2,435	-	-2,435	-0.2	-0.5
Internal Floors	-3,242	-	-3,242	-0.3	-0.6
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	170,549	7,198	177,747	14.2	
Internal Gains					
Lights	3,162	-	3,162	0.3	0.6
People	17,750	27,250	45,000	3.6	8.3
Misc, Computers, Equip	1,265	313,755	315,020	25.2	58.2
Sub Total	22,177	341,005	363,182	29.1	
TOTAL	192,726	348,203	540,929	43.3	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	192,726
Latent cooling load (Btu/h):	348,203
Sensible heat ratio:	0.36
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Zone	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-20,668	-20,668	-1.7	12.4
Roofs	-8,630	-8,630	-0.7	5.2
Ground/Exposed Floors	-16,223	-16,223	-1.3	9.7
External Doors	0	0	0.0	0.0
Windows Conduction	-84,847	-84,847	-6.8	50.8
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-23,387	-23,387	-1.9	14.0
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	1,070	1,070	0.1	-0.6
Internal Floors	-14,326	-14,326	-1.1	8.6
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-167,010	-167,010	-13.4	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-167,010	-167,010	-13.4	100

HEATING SUMMARY

Sensible heating load (Btu/h):	167,010
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	15,437.1	6,450.5	41.8	0.26
Below Grade Walls	-	-	-	-
Windows[2]	6,450.5	6,450.5	100.0	0.51
Doors	-	-	-	-
Floors	6,979.8	-	-	0.09
Roofs[3]	12,392.2	-	-	0.02
COMBINED	34,809.1	6,450.5	18.5	0.14
Internal				
Ceilings	-	-	-	-
Floors	5,521.2	-	-	0.19
Partitions[4]	8,912.8	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Master Room Setpoint (design)	82.0	70.0
Master Room (actual)	82.0	70.0
Mean Radiant Temperature	180.0	163.4
Dry Resultant Temperature	179.0	164.7
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	20,626	25,086
Reheat Minimum (design)	20,626	20,626
Leakage at Design Flow	0	0
Ventilation (requirement)	20,626	20,626
Exhaust (requirement)	15,469	15,469
Infiltration	766	766

CHECKS

Number of People	25.00
ft²/Person	500.04
Average Ceiling Height (ft)	18.38
Btu/h/ft² - Cooling (sensible)	15.42
Btu/h/ft² - Heating	13.36
ft²/ton - Cooling (sensible)	778.36
ft²/ton - Heating	898.22
cfm/ft² - Cooling	1.65
cfm/ft² - Heating	2.01
% Outside Air - Cooling	100.00
% Outside Air - Heating	82.22
Outdoor Air cfm/ft²	1.65
Outdoor Air cfm/person	825.03

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Zone Loads reports are not influenced by system operation.

Zone Loads Report
System: 05 a VAV - Reheat

Long Center Option2
Dh-2

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	8 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 77.7 / 53.8

	Zone Sensible	Zone Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	10,304	-	10,304	0.5	1.9
Roofs	8,006	-	8,006	0.4	1.5
Ground/Exposed Floors	-1,809	-	-1,809	-0.1	-0.3
External Doors	0	-	0	0.0	0.0
Windows Conduction	9,570	-	9,570	0.4	1.8
Skylights Conduction	0	-	0	0.0	0.0
Solar	67,010	-	67,010	3.0	12.4
Infiltration	9,369	13,055	22,425	1.0	4.1
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	683	-	683	0.0	0.1
Internal Floors	-756	-	-756	0.0	-0.1
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	102,378	13,055	115,433	5.1	
Internal Gains					
Lights	38,467	-	38,467	1.7	7.1
People	17,750	27,250	45,000	2.0	8.3
Misc, Computers, Equip	1,163	341,222	342,385	15.2	63.3
Sub Total	57,380	368,472	425,852	19.0	
TOTAL	159,758	381,528	541,285	24.1	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	159,758
Latent cooling load (Btu/h):	381,528
Sensible heat ratio:	0.30
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ZONE PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Zone	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-20,288	-20,288	-0.9	17.7
Roofs	-9,431	-9,431	-0.4	8.3
Ground/Exposed Floors	-15,510	-15,510	-0.7	13.6
External Doors	0	0	0.0	0.0
Windows Conduction	-24,461	-24,461	-1.1	21.4
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-25,758	-25,758	-1.1	22.5
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	117	117	0.0	-0.1
Internal Floors	-18,985	-18,985	-0.8	16.6
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-114,315	-114,315	-5.1	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-114,315	-114,315	-5.1	100

HEATING SUMMARY

Sensible heating load (Btu/h):	114,315
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	16,317.1	1,903.5	11.7	0.13
Below Grade Walls	-	-	-	-
Windows[2]	1,903.5	1,903.5	100.0	0.46
Doors	-	-	-	-
Floors	15,266.9	-	-	0.07
Roofs[3]	22,414.2	-	-	0.02
COMBINED	53,998.2	1,903.5	3.5	0.07
Internal				
Ceilings	22.0	-	-	0.05
Floors	7,169.6	-	-	0.19
Partitions[4]	11,907.3	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Master Room Setpoint (design)	82.0	70.0
Master Room (actual)	82.0	70.0
Mean Radiant Temperature	229.4	218.4
Dry Resultant Temperature	228.8	219.0
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	22,175	22,186
Reheat Minimum (design)	21,773	21,773
Leakage at Design Flow	0	0
Ventilation (requirement)	21,580	21,580
Exhaust (requirement)	13,490	13,490
Infiltration	843	843

CHECKS

Number of People	25.00
ft²/Person	531.34
Average Ceiling Height (ft)	24.67
Btu/h/ft² - Cooling (sensible)	12.03
Btu/h/ft² - Heating	8.61
ft²/ton - Cooling (sensible)	997.77
ft²/ton - Heating	1,394.42
cfm/ft² - Cooling	1.67
cfm/ft² - Heating	1.67
% Outside Air - Cooling	97.32
% Outside Air - Heating	97.27
Outdoor Air cfm/ft²	1.62
Outdoor Air cfm/person	863.21

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Zone Loads reports are not influenced by system operation.

Room Loads Report

Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option2

29 DH -1 Pool area North Circulation
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 15:30
Outside Air (DBT/WBT/RH) °F and %RH	93.7 / 77.0 / 47.0

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	2,816	-	2,816	1.5	3.7
Roofs	-2,009	-	-2,009	-1.1	-2.7
Ground/Exposed Floors	-2,820	-	-2,820	-1.5	-3.7
External Doors	0	-	0	0.0	0.0
Windows Conduction	39,780	-	39,780	21.5	52.7
Skylights Conduction	0	-	0	0.0	0.0
Solar	42,910	-	42,910	23.2	56.8
Infiltration	1,137	735	1,872	1.0	2.5
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-11,428	-	-11,428	-6.2	-15.1
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	70,387	735	71,122	38.4	
Internal Gains					
Lights	3,162	-	3,162	1.7	4.2
People	0	0	0	0.0	0.0
Misc, Computers, Equip	1,265	0	1,265	0.7	1.7
Sub Total	4,427	0	4,427	2.4	
TOTAL	74,814	735	75,549	40.8	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	74,814
Latent cooling load (Btu/h):	735
Sensible heat ratio:	0.99
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-14,960	-14,960	-8.1	18.8
Roofs	-1,113	-1,113	-0.6	1.4
Ground/Exposed Floors	-9,198	-9,198	-5.0	11.6
External Doors	0	0	0.0	0.0
Windows Conduction	-68,796	-68,796	-37.1	86.5
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-2,704	-2,704	-1.5	3.4
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	17,198	17,198	9.3	-21.6
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-79,571	-79,571	-42.9	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-79,571	-79,571	-42.9	100

HEATING SUMMARY

Sensible heating load (Btu/h):	79,571
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	11,823.4	5,125.7	43.4	0.28
Below Grade Walls	-	-	-	-
Windows[2]	5,125.7	5,125.7	100.0	0.53
Doors	-	-	-	-
Floors	1,853.3	-	-	0.19
Roofs[3]	1,744.7	-	-	0.02
COMBINED	15,421.4	5,125.7	33.2	0.24
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	331.4	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	86.1	64.0
Dry Resultant Temperature	84.0	67.0
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	3,541	8,001
Reheat Minimum (design)	3,541	3,541
Leakage at Design Flow	0	0
Ventilation (requirement)	3,541	3,541
Exhaust (requirement)	1,770	1,770
Infiltration	89	89

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	35.37
Btu/h/ft² - Cooling (sensible)	40.37
Btu/h/ft² - Heating	42.93
ft²/ton - Cooling (sensible)	297.27
ft²/ton - Heating	279.50
cfm/ft² - Cooling	1.91
cfm/ft² - Heating	4.32
% Outside Air - Cooling	100.00
% Outside Air - Heating	44.25
Outdoor Air cfm/ft²	1.91
Outdoor Air cfm/person	-

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

Room Loads Report
Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option2
DH-1 Pool Area
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 76.2 / 49.5

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	773	-	773	0.1	0.2
Roofs	0	-	0	0.0	0.0
Ground/Exposed Floors	-5,262	-	-5,262	-0.5	-1.3
External Doors	0	-	0	0.0	0.0
Windows Conduction	1,762	-	1,762	0.2	0.4
Skylights Conduction	0	-	0	0.0	0.0
Solar	53,747	-	53,747	5.0	13.2
Infiltration	1,981	2,349	4,330	0.4	1.1
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-4,784	-	-4,784	-0.4	-1.2
Internal Floors	-3,010	-	-3,010	-0.3	-0.7
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	45,206	2,349	47,555	4.5	
Internal Gains					
Lights	0	-	0	0.0	0.0
People	17,750	27,250	45,000	4.2	11.1
Misc, Computers, Equip	0	313,755	313,755	29.5	77.2
Sub Total	17,750	341,005	358,755	33.7	
TOTAL	62,956	343,354	406,310	38.2	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	62,956
Latent cooling load (Btu/h):	343,354
Sensible heat ratio:	0.15
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,520	-1,520	-0.1	4.4
Roofs	0	0	0.0	0.0
Ground/Exposed Floors	-7,025	-7,025	-0.7	20.3
External Doors	0	0	0.0	0.0
Windows Conduction	-4,411	-4,411	-0.4	12.8
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-5,408	-5,408	-0.5	15.7
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	-1,846	-1,846	-0.2	5.3
Internal Floors	-14,326	-14,326	-1.3	41.5
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-34,536	-34,536	-3.2	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-34,536	-34,536	-3.2	100

HEATING SUMMARY

Sensible heating load (Btu/h):	34,536
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	944.8	330.4	35.0	0.22
Below Grade Walls	-	-	-	-
Windows[2]	330.4	330.4	100.0	0.47
Doors	-	-	-	-
Floors	5,126.4	-	-	0.05
Roofs[3]	-	-	-	-
COMBINED	6,071.3	330.4	5.4	0.08
Internal				
Ceilings	-	-	-	-
Floors	5,521.2	-	-	0.19
Partitions[4]	2,270.4	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	84.5	67.5
Dry Resultant Temperature	83.2	68.7
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	7,083	7,083
Reheat Minimum (design)	7,083	7,083
Leakage at Design Flow	0	0
Ventilation (requirement)	7,083	7,083
Exhaust (requirement)	6,197	6,197
Infiltration	177	177

CHECKS

Number of People	25.00
ft²/Person	425.90
Average Ceiling Height (ft)	9.98
Btu/h/ft² - Cooling (sensible)	5.91
Btu/h/ft² - Heating	3.24
ft²/ton - Cooling (sensible)	2,029.53
ft²/ton - Heating	3,699.60
cfm/ft² - Cooling	0.67
cfm/ft² - Heating	0.67
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	0.67
Outdoor Air cfm/person	283.30

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

Room Loads Report
Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option2
DH-1 Pool Area (upper 1)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 76.2 / 49.5

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	1,234	-	1,234	-	4.4
Roofs	0	-	0	-	0.0
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	2,546	-	2,546	-	9.1
Skylights Conduction	0	-	0	-	0.0
Solar	11,957	-	11,957	-	42.8
Infiltration	2,798	1,905	4,703	-	16.8
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	7,503	-	7,503	-	26.9
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	26,038	1,905	27,942	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	26,038	1,905	27,942	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	26,038
Latent cooling load (Btu/h):	1,905
Sensible heat ratio:	0.93
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,107	-2,107	-	-
Roofs	0	0	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-6,022	-6,022	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-7,638	-7,638	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-6,684	-6,684	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-22,452	-22,452	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-22,452	-22,452	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	22,452
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,334.4	489.6	36.7	0.21
Below Grade Walls	-	-	-	-
Windows[2]	489.6	489.6	100.0	0.43
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	-	-	-	-
COMBINED	1,334.4	489.6	36.7	0.21
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	3,206.4	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.6	67.9
Dry Resultant Temperature	82.8	68.9
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,001	5,001
Reheat Minimum (design)	5,001	5,001
Leakage at Design Flow	0	0
Ventilation (requirement)	5,001	5,001
Exhaust (requirement)	3,751	3,751
Infiltration	250	250

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

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Room Loads Report
Zone: DH-1
System: 05 a VAV - Reheat

Long Center Option2
DH-1 Pool Area (upper 2)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 76.2 / 49.5

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	1,255	-	1,255	-	3.4
Roofs	3,830	-	3,830	-	10.4
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	2,453	-	2,453	-	6.7
Skylights Conduction	0	-	0	-	0.0
Solar	21,162	-	21,162	-	57.4
Infiltration	2,798	1,905	4,703	-	12.8
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	3,439	-	3,439	-	9.3
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	34,936	1,905	36,841	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	34,936	1,905	36,841	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	34,936
Latent cooling load (Btu/h):	1,905
Sensible heat ratio:	0.95
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,080	-2,080	-	-
Roofs	-7,518	-7,518	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-5,617	-5,617	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-7,638	-7,638	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-7,598	-7,598	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-30,451	-30,451	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-30,451	-30,451	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	30,451
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,334.4	504.9	37.8	0.20
Below Grade Walls	-	-	-	-
Windows[2]	504.9	504.9	100.0	0.39
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	10,647.6	-	-	0.02
COMBINED	11,982.0	504.9	4.2	0.04
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	3,436.0	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	80.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.5	68.1
Dry Resultant Temperature	82.8	69.0
RH (Design Max Setpoint) (%)	-	-

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,001	5,001
Reheat Minimum (design)	5,001	5,001
Leakage at Design Flow	0	0
Ventilation (requirement)	5,001	5,001
Exhaust (requirement)	3,751	3,751
Infiltration	250	250

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option2
30 Vestibule
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	7 / 7:30
Outside Air (DBT/WBT/RH) °F and %RH	80.6 / 72.6 / 68.4

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	1,354	-	1,354	5.4	40.1
Roofs	457	-	457	1.8	13.5
Ground/Exposed Floors	368	-	368	1.5	10.9
External Doors	0	-	0	0.0	0.0
Windows Conduction	0	-	0	0.0	0.0
Skylights Conduction	0	-	0	0.0	0.0
Solar	0	-	0	0.0	0.0
Infiltration	-34	77	43	0.2	1.3
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	461	-	461	1.8	13.6
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	96	-	96	0.4	2.8
Ceilings	0	-	0	0.0	0.0
Sub Total	2,702	77	2,779	11.0	
Internal Gains					
Lights	429	-	429	1.7	12.7
People	0	0	0	0.0	0.0
Misc, Computers, Equip	172	0	172	0.7	5.1
Sub Total	601	0	601	2.4	
TOTAL	3,303	77	3,380	13.4	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	3,303
Latent cooling load (Btu/h):	77
Sensible heat ratio:	0.98
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-3,536	-3,536	-14.1	65.1
Roofs	-176	-176	-0.7	3.2
Ground/Exposed Floors	-1,339	-1,339	-5.3	24.6
External Doors	0	0	0.0	0.0
Windows Conduction	0	0	0.0	0.0
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-489	-489	-1.9	9.0
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	106	106	0.4	-1.9
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-5,434	-5,434	-21.6	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-5,434	-5,434	-21.6	100

HEATING SUMMARY

Sensible heating load (Btu/h):	5,434
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,462.0	-	-	0.09
Below Grade Walls	-	-	-	-
Windows[2]	-	-	-	-
Doors	-	-	-	-
Floors	251.6	-	-	0.19
Roofs[3]	251.4	-	-	0.02
COMBINED	1,965.0	-	-	0.09
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	1,192.2	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.1	70.0
Mean Radiant Temperature	83.1	67.7
Dry Resultant Temperature	82.6	68.8
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	112	248
Reheat Minimum (design)	75	75
Leakage at Design Flow	0	0
Ventilation (requirement)	19	19
Exhaust (requirement)	-	-
Infiltration	16	16

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	38.15
Btu/h/ft² - Cooling (sensible)	13.13
Btu/h/ft² - Heating	21.60
ft²/ton - Cooling (sensible)	914.07
ft²/ton - Heating	555.54
cfm/ft² - Cooling	0.44
cfm/ft² - Heating	0.99
% Outside Air - Cooling	16.87
% Outside Air - Heating	7.60
Outdoor Air cfm/ft²	0.08
Outdoor Air cfm/person	-

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option2
31 Vestibule
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	9 / 11:30
Outside Air (DBT/WBT/RH) °F and %RH	89.8 / 76.1 / 53.4

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-614	-	-614	-2.3	-3.9
Roofs	-807	-	-807	-3.1	-5.2
Ground/Exposed Floors	-2,037	-	-2,037	-7.7	-13.1
External Doors	0	-	0	0.0	0.0
Windows Conduction	1,750	-	1,750	6.6	11.3
Skylights Conduction	0	-	0	0.0	0.0
Solar	18,742	-	18,742	70.9	120.5
Infiltration	124	142	266	1.0	1.7
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-2,375	-	-2,375	-9.0	-15.3
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	14,784	142	14,926	56.4	
Internal Gains					
Lights	451	-	451	1.7	2.9
People	0	0	0	0.0	0.0
Misc, Computers, Equip	181	0	181	0.7	1.2
Sub Total	632	0	632	2.4	
TOTAL	15,415	142	15,558	58.8	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	15,415
Latent cooling load (Btu/h):	142
Sensible heat ratio:	0.99
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,732	-1,732	-6.5	20.0
Roofs	-178	-178	-0.7	2.1
Ground/Exposed Floors	-1,344	-1,344	-5.1	15.5
External Doors	0	0	0.0	0.0
Windows Conduction	-5,607	-5,607	-21.2	64.8
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-514	-514	-1.9	5.9
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	716	716	2.7	-8.3
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-8,658	-8,658	-32.7	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-8,658	-8,658	-32.7	100

HEATING SUMMARY

Sensible heating load (Btu/h):	8,658
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,453.8	402.8	27.7	0.21
Below Grade Walls	-	-	-	-
Windows[2]	402.8	402.8	100.0	0.53
Doors	-	-	-	-
Floors	264.5	-	-	0.19
Roofs[3]	264.5	-	-	0.02
COMBINED	1,982.8	402.8	20.3	0.18
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	1,061.3	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	87.7	65.8
Dry Resultant Temperature	84.9	67.9
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	522	396
Reheat Minimum (design)	157	157
Leakage at Design Flow	0	0
Ventilation (requirement)	20	20
Exhaust (requirement)	-	-
Infiltration	17	17

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	38.17
Btu/h/ft² - Cooling (sensible)	58.29
Btu/h/ft² - Heating	32.74
ft²/ton - Cooling (sensible)	205.88
ft²/ton - Heating	366.55
cfm/ft² - Cooling	1.97
cfm/ft² - Heating	1.50
% Outside Air - Cooling	3.80
% Outside Air - Heating	5.01
Outdoor Air cfm/ft²	0.07
Outdoor Air cfm/person	-

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option2
32 DH-2 Pool Area Circulation
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 76.2 / 49.5

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	2,686	-	2,686	2.3	12.1
Roofs	283	-	283	0.2	1.3
Ground/Exposed Floors	-487	-	-487	-0.4	-2.2
External Doors	0	-	0	0.0	0.0
Windows Conduction	948	-	948	0.8	4.3
Skylights Conduction	0	-	0	0.0	0.0
Solar	17,285	-	17,285	14.6	78.0
Infiltration	828	564	1,392	1.2	6.3
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-2,771	-	-2,771	-2.3	-12.5
Internal Floors	0	-	0	0.0	0.0
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	-3	-	-3	0.0	0.0
Sub Total	18,769	564	19,333	16.3	
Internal Gains					
Lights	2,026	-	2,026	1.7	9.1
People	0	0	0	0.0	0.0
Misc, Computers, Equip	811	0	811	0.7	3.7
Sub Total	2,837	0	2,837	2.4	
TOTAL	21,606	564	22,170	18.7	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	21,606
Latent cooling load (Btu/h):	564
Sensible heat ratio:	0.97
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-8,486	-8,486	-7.1	46.5
Roofs	-804	-804	-0.7	4.4
Ground/Exposed Floors	-6,677	-6,677	-5.6	36.6
External Doors	0	0	0.0	0.0
Windows Conduction	-2,639	-2,639	-2.2	14.5
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-2,261	-2,261	-1.9	12.4
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	2,618	2,618	2.2	-14.3
Internal Floors	0	0	0.0	0.0
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-18,249	-18,249	-15.4	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-18,249	-18,249	-15.4	100

HEATING SUMMARY

Sensible heating load (Btu/h):	18,249
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	3,735.4	176.7	4.7	0.11
Below Grade Walls	-	-	-	-
Windows[2]	176.7	176.7	100.0	0.53
Doors	-	-	-	-
Floors	1,187.8	-	-	0.19
Roofs[3]	1,143.6	-	-	0.02
COMBINED	6,066.8	176.7	2.9	0.11
Internal				
Ceilings	44.1	-	-	0.05
Floors	-	-	-	-
Partitions[4]	2,305.0	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.7	67.9
Dry Resultant Temperature	82.8	69.0
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	2,961	2,961
Reheat Minimum (design)	2,961	2,961
Leakage at Design Flow	0	0
Ventilation (requirement)	2,961	2,961
Exhaust (requirement)	1,480	1,480
Infiltration	74	74

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	37.39
Btu/h/ft² - Cooling (sensible)	18.19
Btu/h/ft² - Heating	15.36
ft²/ton - Cooling (sensible)	659.67
ft²/ton - Heating	781.03
cfm/ft² - Cooling	2.49
cfm/ft² - Heating	2.49
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	2.49
Outdoor Air cfm/person	-

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option2
DH-2 Pool Area
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	8 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 77.7 / 53.8

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	870	-	870	0.1	0.2
Roofs	0	-	0	0.0	0.0
Ground/Exposed Floors	-1,550	-	-1,550	-0.1	-0.3
External Doors	0	-	0	0.0	0.0
Windows Conduction	1,528	-	1,528	0.1	0.3
Skylights Conduction	0	-	0	0.0	0.0
Solar	33,794	-	33,794	2.9	7.5
Infiltration	2,139	3,820	5,960	0.5	1.3
Nat/Aux Vent	0	0	0	0.0	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	-8,883	-	-8,883	-0.8	-2.0
Internal Floors	-756	-	-756	-0.1	-0.2
Internal Air & Furniture	0	-	0	0.0	0.0
Ceilings	0	-	0	0.0	0.0
Sub Total	27,143	3,820	30,963	2.7	
Internal Gains					
Lights	35,560	-	35,560	3.1	7.9
People	17,750	27,250	45,000	3.9	9.9
Misc, Computers, Equip	0	341,222	341,222	29.5	75.4
Sub Total	53,310	368,472	421,783	36.4	
TOTAL	80,453	372,293	452,746	39.1	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	80,453
Latent cooling load (Btu/h):	372,293
Sensible heat ratio:	0.18
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-1,610	-1,610	-0.1	4.8
Roofs	0	0	0.0	0.0
Ground/Exposed Floors	-6,150	-6,150	-0.5	18.3
External Doors	0	0	0.0	0.0
Windows Conduction	-3,582	-3,582	-0.3	10.7
Skylights Conduction	0	0	0.0	0.0
Solar	0	0	0.0	0.0
Infiltration	-5,882	-5,882	-0.5	17.5
Nat/Aux Vent	0	0	0.0	0.0
Internal Building Gains/Losses				
Internal Walls/Openings	2,683	2,683	0.2	-8.0
Internal Floors	-18,985	-18,985	-1.6	56.6
Internal Air & Furniture	0	0	0.0	0.0
Ceilings	0	0	0.0	0.0
Sub Total	-33,527	-33,527	-2.9	
Internal Gains				
Lights	0	0	0.0	0.0
People	0	0	0.0	0.0
Misc, Computers, Equip	0	0	0.0	0.0
Sub Total	0	0	0.0	
TOTAL	-33,527	-33,527	-2.9	100

HEATING SUMMARY

Sensible heating load (Btu/h):	33,527
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,027.6	363.7	35.4	0.18
Below Grade Walls	-	-	-	-
Windows[2]	363.7	363.7	100.0	0.34
Doors	-	-	-	-
Floors	4,432.2	-	-	0.05
Roofs[3]	-	-	-	-
COMBINED	5,459.8	363.7	6.7	0.08
Internal				
Ceilings	-	-	-	-
Floors	7,147.5	-	-	0.19
Partitions[4]	2,474.9	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	84.4	68.0
Dry Resultant Temperature	83.2	69.0
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	7,703	7,703
Reheat Minimum (design)	7,703	7,703
Leakage at Design Flow	0	0
Ventilation (requirement)	7,703	7,703
Exhaust (requirement)	3,851	3,851
Infiltration	193	193

CHECKS

Number of People	25.00
ft²/Person	463.19
Average Ceiling Height (ft)	9.98
Btu/h/ft² - Cooling (sensible)	6.95
Btu/h/ft² - Heating	2.90
ft²/ton - Cooling (sensible)	1,727.17
ft²/ton - Heating	4,144.61
cfm/ft² - Cooling	0.67
cfm/ft² - Heating	0.67
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	0.67
Outdoor Air cfm/person	308.10

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Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option2
DH-2 Pool Area (upper 1)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	8 / 16:30
Outside Air (DBT/WBT/RH) °F and %RH	92.7 / 78.1 / 52.3

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	1,140	-	1,140	-	4.3
Roofs	0	-	0	-	0.0
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	3,001	-	3,001	-	11.4
Skylights Conduction	0	-	0	-	0.0
Solar	7,375	-	7,375	-	28.1
Infiltration	3,314	3,997	7,311	-	27.8
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	7,429	-	7,429	-	28.3
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	22,259	3,997	26,257	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	22,259	3,997	26,257	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	22,259
Latent cooling load (Btu/h):	3,997
Sensible heat ratio:	0.85
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,438	-2,438	-	-
Roofs	0	0	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-6,748	-6,748	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-8,306	-8,306	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-3,373	-3,373	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-20,866	-20,866	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-20,866	-20,866	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	20,866
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,451.2	487.7	33.6	0.22
Below Grade Walls	-	-	-	-
Windows[2]	487.7	487.7	100.0	0.48
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	-	-	-	-
COMBINED	1,451.2	487.7	33.6	0.22
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	3,412.3	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.2	68.5
Dry Resultant Temperature	82.6	69.2
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,439	5,439
Reheat Minimum (design)	5,439	5,439
Leakage at Design Flow	0	0
Ventilation (requirement)	5,439	5,439
Exhaust (requirement)	4,079	4,079
Infiltration	272	272

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

Data in this report is firstly from the Room Loads (.clg and .htg) results files and the VE model. When there is an associated ApacheHVAC file, additional data from that file is included; however, the reported values for loads and calculated design airflows in these Room Loads reports are not influenced by system operation.

Room Loads Report
Zone: Dh-2
System: 05 a VAV - Reheat

Long Center Option2
DH-2 Pool Area (upper 2)
HVAC Methodology: ApacheHVAC

IES VIRTUAL ENVIRONMENT
VE 2023

COOLING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	6 / 17:30
Outside Air (DBT/WBT/RH) °F and %RH	91.6 / 76.2 / 49.5

	Room Sensible	Room Latent	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	1,456	-	1,456	-	4.9
Roofs	7,488	-	7,488	-	25.0
Ground/Exposed Floors	0	-	0	-	0.0
External Doors	0	-	0	-	0.0
Windows Conduction	2,535	-	2,535	-	8.5
Skylights Conduction	0	-	0	-	0.0
Solar	10,649	-	10,649	-	35.5
Infiltration	3,043	2,072	5,114	-	17.1
Nat/Aux Vent	0	0	0	-	0.0
Internal Building Gains/Losses					
Internal Walls/Openings	2,729	-	2,729	-	9.1
Internal Floors	0	-	0	-	0.0
Internal Air & Furniture	0	-	0	-	0.0
Ceilings	0	-	0	-	0.0
Sub Total	27,899	2,072	29,971	0.0	
Internal Gains					
Lights	0	-	0	-	0.0
People	0	0	0	-	0.0
Misc, Computers, Equip	0	0	0	-	0.0
Sub Total	0	0	0	0.0	
TOTAL	27,899	2,072	29,971	0.0	100

COOLING SUMMARY

Sensible cooling load (Btu/h):	27,899
Latent cooling load (Btu/h):	2,072
Sensible heat ratio:	0.93
Design Supply Airflow calculated per:	Sensible Loads
Design zone air temp for Supply Airflow calculation (°F):	82.0

HEATING ROOM PEAK

Time of Peak (Mo/Hr:Mn)	Heating Design
Outside Air (DBT/WBT/RH) °F and %RH	42.1 / 35.4 / 49.6

	Room	Net Value	Per Floor Area	Percent of Total
Envelope Gains/Losses	Btu/h	Btu/h	Btu/h·ft²	%
External Walls	-2,486	-2,486	-	-
Roofs	-8,273	-8,273	-	-
Ground/Exposed Floors	0	0	-	-
External Doors	0	0	-	-
Windows Conduction	-5,883	-5,883	-	-
Skylights Conduction	0	0	-	-
Solar	0	0	-	-
Infiltration	-8,306	-8,306	-	-
Nat/Aux Vent	0	0	-	-
Internal Building Gains/Losses				
Internal Walls/Openings	-2,632	-2,632	-	-
Internal Floors	0	0	-	-
Internal Air & Furniture	0	0	-	-
Ceilings	0	0	-	-
Sub Total	-27,580	-27,580	0.0	
Internal Gains				
Lights	0	0	-	-
People	0	0	-	-
Misc, Computers, Equip	0	0	-	-
Sub Total	0	0	0.0	
TOTAL	-27,580	-27,580	0.0	0

HEATING SUMMARY

Sensible heating load (Btu/h):	27,580
Design zone air temp for Supply Airflow calculation (°F):	70.0

AREAS & THERMAL TRANSMITTANCE

	Total Area	Glazing	Glazing	U-value[1]
	ft²	ft²	%	Btu/h·ft²·°F
External				
Wall (above grade)	1,451.2	472.7	32.6	0.20
Below Grade Walls	-	-	-	-
Windows[2]	472.7	472.7	100.0	0.43
Doors	-	-	-	-
Floors	-	-	-	-
Roofs[3]	11,579.7	-	-	0.02
COMBINED	13,030.9	472.7	3.6	0.04
Internal				
Ceilings	-	-	-	-
Floors	-	-	-	-
Partitions[4]	3,558.8	-	-	0.33

[1] Area-weighted U-value; [2] Windows/glazing include glass and frames; [3] Roofs incl. skylights; [4] Partitions incl. internal windows and doors.

TEMPERATURES & SETPOINTS

	Cooling	Heating
	°F	°F
Supply Air (design)	55.0	90.0
Room Setpoint (design)	82.0	70.0
Room (actual)	82.0	70.0
Mean Radiant Temperature	83.1	68.7
Dry Resultant Temperature	82.5	69.3
RH (Design Max Setpoint) (%)	60.0	60.0

AIRFLOW

	Cooling	Heating
	cfm	cfm
Supply (design)	5,439	5,439
Reheat Minimum (design)	5,439	5,439
Leakage at Design Flow	0	0
Ventilation (requirement)	5,439	5,439
Exhaust (requirement)	4,079	4,079
Infiltration	272	272

CHECKS

Number of People	0.00
ft²/Person	-
Average Ceiling Height (ft)	14.09
Btu/h/ft² - Cooling (sensible)	-
Btu/h/ft² - Heating	-
ft²/ton - Cooling (sensible)	-
ft²/ton - Heating	-
cfm/ft² - Cooling	-
cfm/ft² - Heating	-
% Outside Air - Cooling	100.00
% Outside Air - Heating	100.00
Outdoor Air cfm/ft²	-
Outdoor Air cfm/person	-

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HVAC LIFE CYCLE COST ANALYSIS SUMMARY

Clearwater Long Center Natatorium
12/27/2023

OPTION	DESCRIPTION	INSTALLATION COSTS		30 YEARS OF ENERGY COST		30 YEARS OF MAINTENANCE COSTS		30 YEARS OF REPLACEMENT COSTS		
1	Glazing	=	+	$3,337,675.00	+	=	+	=	=	
2	Less Glazing	=	+	$2,829,776	+	=	+	=	=	