

To: Portsmouth Planning Board

From: Michael Street, Property Manager

Nobles Island Condominium Association

Date: April 21, 2023

Re: Conservation Commission Approval

To Whom It May Concern:

Based on feedback from the Conservation Commission at the Conservation Commission Meeting on April 12, 2023 Nobles Island Condo Association plans to take the following measures:

- 1) Remove all rodent bait stations around the foundations.
- 2) Add gravel beds to the edge of the parking lot in two areas where water flows off the parking lot.
- 3) Stop watering small lawn behind Building B.
- 4) Plant native shrubs behind Building B between the rip rap ledge and the decks.

Nobles Island Condominium Association

500 Market Street
Portsmouth, NH 03801

To: Portsmouth Planning Board

From: David Porter, President of the Board of Directors

Nobles Island Condominium Association

Date: March 16, 2023

Re: Authorization of Representative

To Whom it May Concern,

Please accept this document as authorization by the Nobles Island Condominium Association Board of Directors that Michael Street, of CP Management LLC. will represent us in our current applications for Wetland Conditional Use Permit now before the Conservation Commission and Portsmouth Planning Board and related to our application to replace the exterior decks.

Thank you in advance for your considerations.

Respectfully,

Nobles Island Condominium Association, by

David Porter, President of the Board of Directors

Memorandum Tighe&Bond

Noble's Island Condominiums Deck Replacement Existing Application LU-20-236

To: Portsmouth Planning Department

FROM: Leonard Lord
COPY: Michael Street
DATE: April 27, 2021

Tighe & Bond, representing Noble Island Condominiums, is pleased to present the following information for review and approval by the conservation commission and planning board. Noble's Island Condominiums is proposing to replace its degraded cantilevered ground floor decks with new decks within the same footprint and with no expansion of use.

Project Description

The proposed project is located on Noble's Island at 500 Market Street in a highly developed area near the Portsmouth working waterfront. The project area has a long history of residential and commercial use, but was redeveloped for the current uses in the early 1980's. The Noble's Island Condominiums consist of three buildings that sit above the Piscataqua River. Four additional commercial buildings with parking lots are also located on the parcel. The intensive development has resulted in nearly 83% impervious surfaces and an extensively armored riprap perimeter. A wetland impact permit was obtained for the site in 1997 to restabilize the riprap and reduce the slope from 1:1 to 1.25:1 (NHDES #1997-00089).

The proposed project is needed to address the safety of the residents of the Noble's Island Condominiums. Each building includes 12-foot wide decks off the ground floor that extend toward the Piscataqua River. The decks are currently cantilevered and supported by rusting steel beams. The proposed deck replacements will be confined to the same footprint as the existing decks but, unlike the existing design, will incorporate concrete piers as supports.

Inland Wetlands

There are no inland wetlands on the parcel.

Impacted Jurisdictional Areas

Replacement of the decks will involve 27+/- square feet (sf) of permanent impacts at grade and within the existing deck footprint for the concrete piers. Temporary impacts associated with excavation and placement of the piers are estimated to result in up to 1,240 sf of soil disturbance. All work will be completed within the 100-foot tidal buffer zone, with no direct wetland impacts.

Distance to the Wetland

At the closest point, the deck repairs will be approximately five feet horizontally of the Highest Observable Tide Line (Building A) but will also be four feet above it vertically. Proper erosion and sediment controls will be in place (silt socks) and no work will be completed past the upper edge of the riprap slope. See attached figures.

MEMO Tighe&Bond

Total Buffer Area on the Lot

Total buffer area on the lot is approximately 70,000 square feet.

Project Representatives

Agent/Wetland Scientists

Leonard Lord, Tighe & Bond, <u>LLord@TigheBond.com</u>, Jeremy Degler, Tighe & Bond, <u>JDegler@TigheBond.com</u> 177 Corporate Avenue, Portsmouth, NH 03801.

Owner

Noble's Island Condominium Association, David Porter, President c/o Michael Street, CP Management, MichaelS@CPManagement.com 11 Court Street, Exeter, NH 03833

Project Plans

Plans meeting the requirements Section 10.1017.20 of the Portsmouth Zoning Ordinance are attached in the NHDES permit application.

Functional Assessment

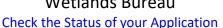
A functional assessment was not required as part of NHDES permitting, so a separate assessment is attached to this memo.

ASSESSMENT FOR PORTSMOUTH CONDITIONAL USE APPLICATION



WETLANDS FUNCTIONAL ASSESSMENT WORKSHEET

Water Division/Land Resource Management Wetlands Bureau





RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: Noble's Island Condominiums

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the <u>Coastal Area</u> Worksheet (NHDES-W-06-079) for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the <u>Avoidance and Minimization Written Narrative (NHDES-W-06-089)</u> and the <u>Avoidance and Minimization Checklist (NHDES-W-06-050)</u> to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached to the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)				
ADJACENT LAND USE: Condominiums with	n lawns and parking lots			
CONTIGUOUS UNDEVELOPED BUFFER ZO	NE PRESENT? Yes No			
DISTANCE TO NEAREST ROADWAY OR OT	HER DEVELOPMENT (in feet): <10 ft			
SECTION 2 - DELINEATION (USACE HIGH)	WAY METHODOLOGY; Env-Wt 311.10)			
CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Leonard Lord, PhD, CWS				
DATE(S) OF SITE VISIT(S): March 15, 2021 DELINEATION PER ENV-WT 406 COMPLETED? Yes No				
CONFIRM THAT THE EVALUATION IS BASED ON:				
☑ Office and				
Field examination.				
METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in blank if "other"): USACE Highway Methodology. Other scientifically supported method (enter name/ title): NH Method, 2015("NHM" for Ecological Integrity Eval)				
Other scientifically supported method	(enter name/ title): NH Method, 2015(NHM) for Ecological Integrity Eval)			

the wetland.

2020-05

SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)					
WETLAND ID: LOCATION: (LAT/ LONG) /					
WETLAND AREA: N/A	DOMINANT WETLAND SYSTEMS PRESENT: Mudflats				
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND?	COWARDIN CLASS: E2US3N				
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? ☐ Yes ☑ No	IS THE WETLAND PART OF: A wildlife corridor or A habitat island?				
if not, where does the wetland lie in the drainage basin?	IS THE WETLAND HUMAN-MADE? ☐ Yes ☑ No				
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? ☑ Yes ☐ No	ARE VERNAL POOLS PRESENT? Yes No (If yes, complete the Vernal Pool Table)				
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? Yes □ No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? ☐ Yes ☐ No				
PROPOSED WETLAND IMPACT TYPE: Buffer only	PROPOSED WETLAND IMPACT AREA: N/A				
SECTION 4 - WETLANDS FUNCTIONS AND VALUES (USACE H	IIGHWAY METHODOLOGY; Env-Wt 311.10)				
The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values: 1. Ecological Integrity (from RSA 482-A:2, XI) 2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value) 3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat) 4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration) 5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge) 6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat) 7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient Removal) 8. Production Export (Nutrient) (from USACE Highway Methodology) 9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics) 10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention) 11. Shoreline Anchoring (from USACE Highway Methodology: Sediment /Toxicant Retention) 12. Uniqueness/Heritage (from USACE Highway Methodology) 13. Wetland-based Recreation (from USACE Highway Methodology: Recreation) 14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)					
First, determine if a wetland is suitable for a particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE <i>The Highway Methodology Workbook Supplement</i> . Second, indicate which functions and values are principal ("Principal Function/value?" column). As described in <i>The Highway Methodology Workbook Supplement</i> , "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of					

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	∑ Yes ☐ No	Ecological Integrity (from NHM): 3,4,5,6	Yes No	Highly developed buffer, filling, impaired water quality
2	☐ Yes ☑ No	Education Potential: N/A	☐ Yes ☑ No	No access
3	⊠ Yes □ No	Fish & Aquatic Life: 1, 4	Yes No	Mudflat supports fish, shellfish, waterfowl. Impaired water quality and no shellfish harvesting
4	☐ Yes ☑ No	Flood Storage: N/A	Yes No	
5	☐ Yes ☑ No	Groundwater Recharge (only): N/A	Yes No	
6	☐ Yes ☑ No	Noteworthiness (RTE):	Yes No	No rare species per NHB DataCheck
7	☐ Yes ☑ No	Nutrient Trapping/Retention: N/A	Yes No	
8	⊠ Yes □ No	Production Export: 1,4,5,6,10	Yes No	Export of nutirents as food and in sediments but low ecological integrity
9	Yes No	Scenic Quality:2,6,8,	☐ Yes ☑ No	Scenic vistas surrounded by highly developed areas.
10	☐ Yes ☑ No	Sediment Trapping: N/A	Yes No	
11	☐ Yes ☑ No	Shoreline Anchoring: N/A	☐ Yes ☑ No	Riprap at project site
12	⊠ Yes □ No	Uniqueness/Heritage: 1,314,17,19,22, 27	Yes No	Contributes to the character of the area. Scienic views in urban setting. Low ecological integrity.
13	⊠ Yes □ No	Wetland Based Recreation: 2,5,7,8,9,10,	Yes No	Provides boating and fishing opportunities. Somewhat offset by low ecological integrity.
14	⊠ Yes □ No	Water Dependent Wildlife: 8,12,18,21,	☐ Yes ☑ No	Mudflats are important for wildlife habitat. Somewhat offset by low ecological integrity

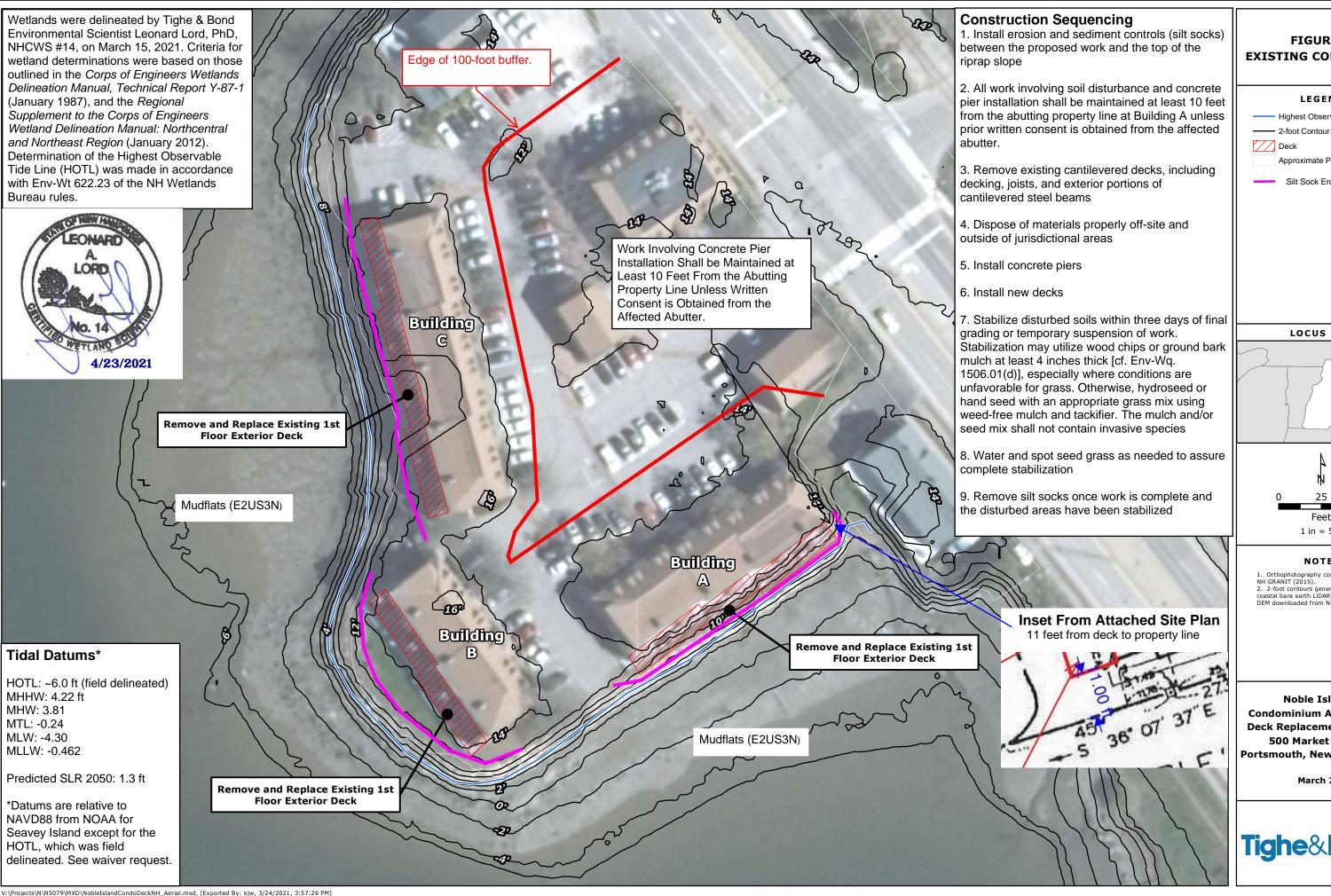


FIGURE 2 **EXISTING CONDITIONS**



Highest Observable Tide Line

Approximate Parcel Boundary

Silt Sock Erosion Control

LOCUS MAP



1 in = 50 ftNOTES

1. Orthophotography courtesy of

NH GRANIT (2015).
2. 2-foot contours generated from 2014 coastal bare earth LiDAR DEM.
DEM downloaded from NH GRANIT.

Noble Island Condominium Association Deck Replacement Project 500 Market Street Portsmouth, New Hampshire

March 2021

Tighe&Bond



CPManagement, Inc & Michael Street as agent for:

Nobles Island Condominium Association – Annual Meeting June 24, 2020 at 5:00 PM held electronically via Zoom Minutes

Those in attendance: For CPManagement, Michael Street, Property Manager (taking minutes). From Nobles Island: Ed Wilson, Loannis Korkolis, Francis Lord, Paula Monahan, Bill Buckley, Alexandra Deegan, Tracy Pierce, Linda Haytayan, and Christopher Goepfert. Board Members: David Choate, David Porter, Tom Valentine, Paula Reid, Valerie Rochon, Victoria Stanhope, and Marc Schwanbeck. Zoom Meeting Host: Paula Reid

Call to Order

D. Porter, Board President, opened the meeting at 5:02pm, all persons in the room proceeded with self-introductions. A quorum was established at 60.84% of the owners present in person or represented by proxy at the commencement of the meeting.

Recitation and Proof of Meeting Notice

M. Street represented that all unit owners were informed of the Annual Meeting in a manner prescribed by NH State Statute and the Bylaws of Nobles Island.

Approval of Prior Year Annual Minutes

D. Porter asked if anyone had any comments or changes to the Annual Meeting Minutes for the meeting held on June 26th, 2019. T. Valentine made a motion to accept the 2019 Annual Meeting Minutes as amended, David Choate seconded the motion. P. Reid created a poll on Zoom for which those in attendance voted. The motion passed unanimously.

Association Accomplishments in 2019-20

D. Porter presented the list of accomplishments over the past twelve months which included the following:

- Operated at below budgeted costs.
- Capital reserve balance by end of fiscal year 2020 will exceed \$300k which is \$100k higher than reserve plan.
- Condo fees for 2020-2021 not increased to reflect impact of Covid-19 pandemic on our Owners.
- Engaged engineer to study and create a rebuild plan for first floor rear decks on Buildings A, B, and C.

Current Project Review

D. Porter gave an update of the rear deck project. The initial project plan called for removal of the wood components, sandblasting and treating of steel beams. However, the cost estimates for this including rebuild were to exceed \$250k and did not address the sliding doors that are binding and would also require ongoing maintenance of the steel. The new project plan involves a longer term solution at a lower cost without the frequent ongoing maintenance requirement. Associated Design Partners in Portland, ME will be engineering a design plan once test pits are dug and analyzed to

determine deck footing feasibility. The engineer will also be addressing the second floor decks that are "sagging". The actual construction is likely to start Spring 2021.

Dumpster Corral: When we repair/reconfigure/replace the existing/damaged dumpster corral, dumpsters will be placed "side by side" freeing up parking spaces. We will be working with Portsmouth HDC for approval.

Develop opportunity through Eversource and the NH Saves Program for Association residential units that will identify potential energy savings, and fund up to 90% of projected costs of the projects.

Presentation of Budget and Reserves

- T. Valentine provided his financial report. No condo fee increase for the 2020-2021 budget year. Forecasted revenue for 2019-2020 projected to meet budget. Electricity is projected to exceed the budget by 36% which is still being investigated by CPM. Insurance is projected to be 7% under budget. The reserve funding is \$100k ahead of schedule and that is explained by delayed projects for deck work and the dumpster corral as well as coming in under budget for Building 1 hallway renovation and the sidewalk project. Also, the operating budget was able to absorb \$33k in maintenance over the last few years.
- P. Reid moved to accept the proposed 2020-2021 operating budget. Valerie Rochon seconded the motion. P. Reid created a poll on Zoom for which those in attendance voted. The motion passed unanimously.
- B. Buckley moved and P. Reid seconded to approve the transfer of the anticipated 2019-2020 operating budget surplus to reserves. P. Reid created a poll on Zoom for which those in attendance voted. The motion passed unanimously.

Open Session

- C. Goepfert asked if the amount of snowfall effects the operating budget. D. Choate and T. Valentine explained the contract with Bayberry is a fixed price, however, the parking lot quickly runs out of room to store snow so the cost of hauling snow off the property is an additional cost which has its own line item in the budget as a guess based on prior year averages.
- B. Buckley asked if the rear decks could be expanded towards the pond and if the condensers currently on the deck could be placed on the roof to create more room. D. Porter stated it is highly unlikely the governing bodies issuing permits for the deck reconstruction would allow the deck to be closer to the water. D. Porter also stated the attic and roof structure may not be designed to support the weight of the condensers over a long period of time. B. Buckley also thanked the Board for looking into the feasibility of removing the steel beams and dropping the decks to ground level.
- P. Monahan asked what the parking lot maintenance line item in the operating budget was for. T. Valentine explained it's for general maintenance such as crack sealing, fixing pot holes, etc. All the lines were painted last year. P. Monahan suggested the stamped walkways be painted.
- A. Degen pointed out some landscaping concerns including the overgrown lilac trees in front of the townhouses, and the rose hip plants have aphids on them. A. Degen also suggested disposing of the rusted propane grilles between Buildings B and C. Paula Reid said the lilac trees were not planted in a good spot to thrive and will be a big project to remove and replace. Until the money is allocated in the budget, the focus should be on the rear deck project. A. Degen also mentioned the bulk items left in and around the dumpster. Several Owners in attendance provided input and the group consensus was that policing the issue is very difficult and the Trioano Waste does not charge by the weight of

the dumpster. A. Degen also asked about the status of the directory sign. M. Street explained a replacement is in the works.

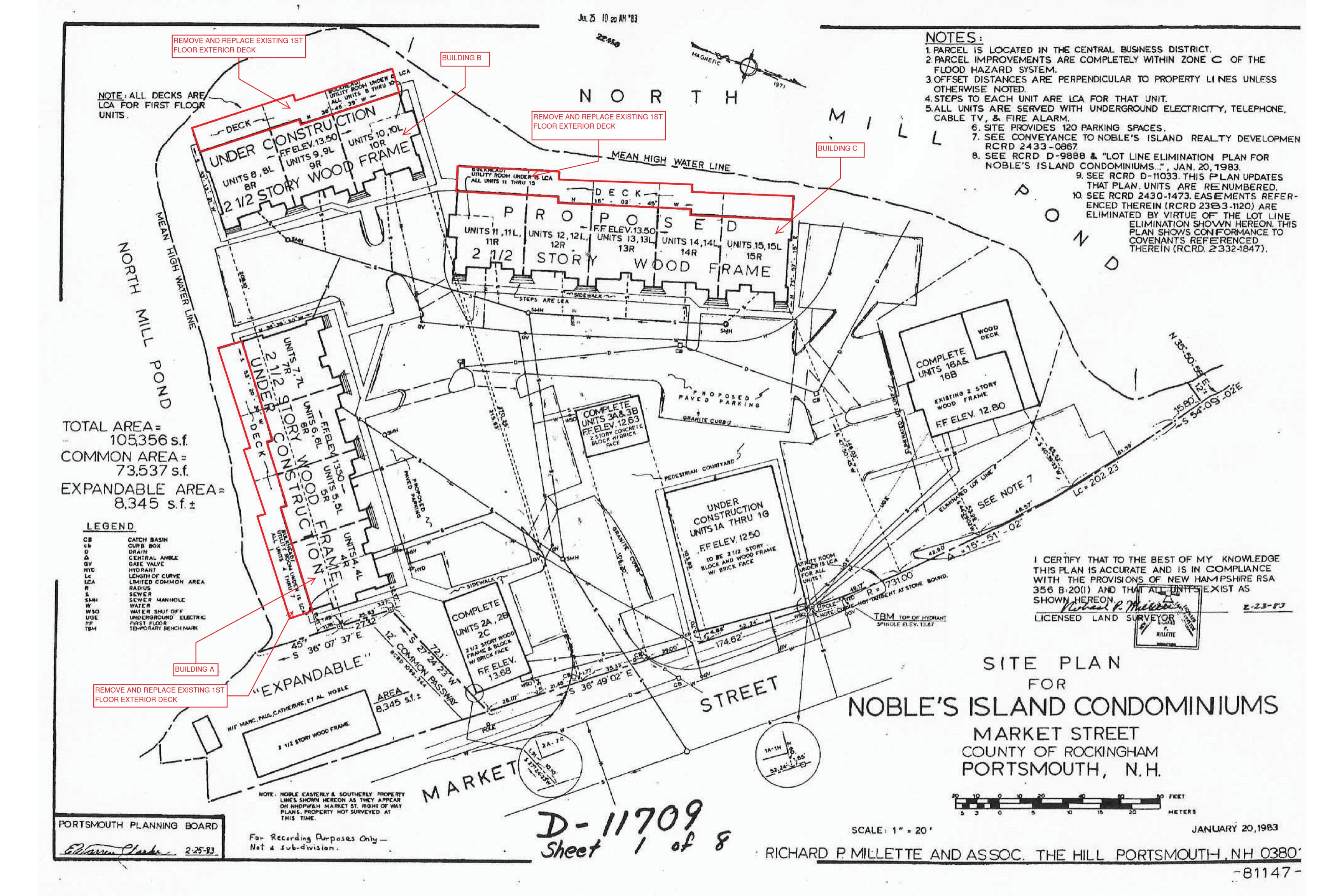
P. Monahan asked if the lower decks are common area. B. Buckley explained the lower decks are defined as 'limited common area' in the Declaration which means the Association owns and maintains them, but are limited to the use of less than all Owners.

New Slate of Proposed Board Members

E. Wilson made a motion to approve the following slate of officers going forward into the new year:

Thomas Valentine, Unit 6L – Treasurer
David Choate, Unit 9 – Secretary
David Porter, Unit 10R – President
Victoria Stanhope, Unit 1C – Board Member
Valerie Rochon, Portsmouth Chamber – Board Member
Paula Reid, Unit 15 – Board Member
Marc Schwanbeck, Unit 13L – Board Member

- P. Reid asked if anyone was interested in serving n the Board to please volunteer. D. Porter seconded the motion and the motion carried.
- D. Porter moved to adjourn the meeting at 6:17pm. P. Reid seconded and the motion passed unanimously.



20089 500 Market St / Portsmouth, NH Photographs taken by Aaron Wilson, P.E.

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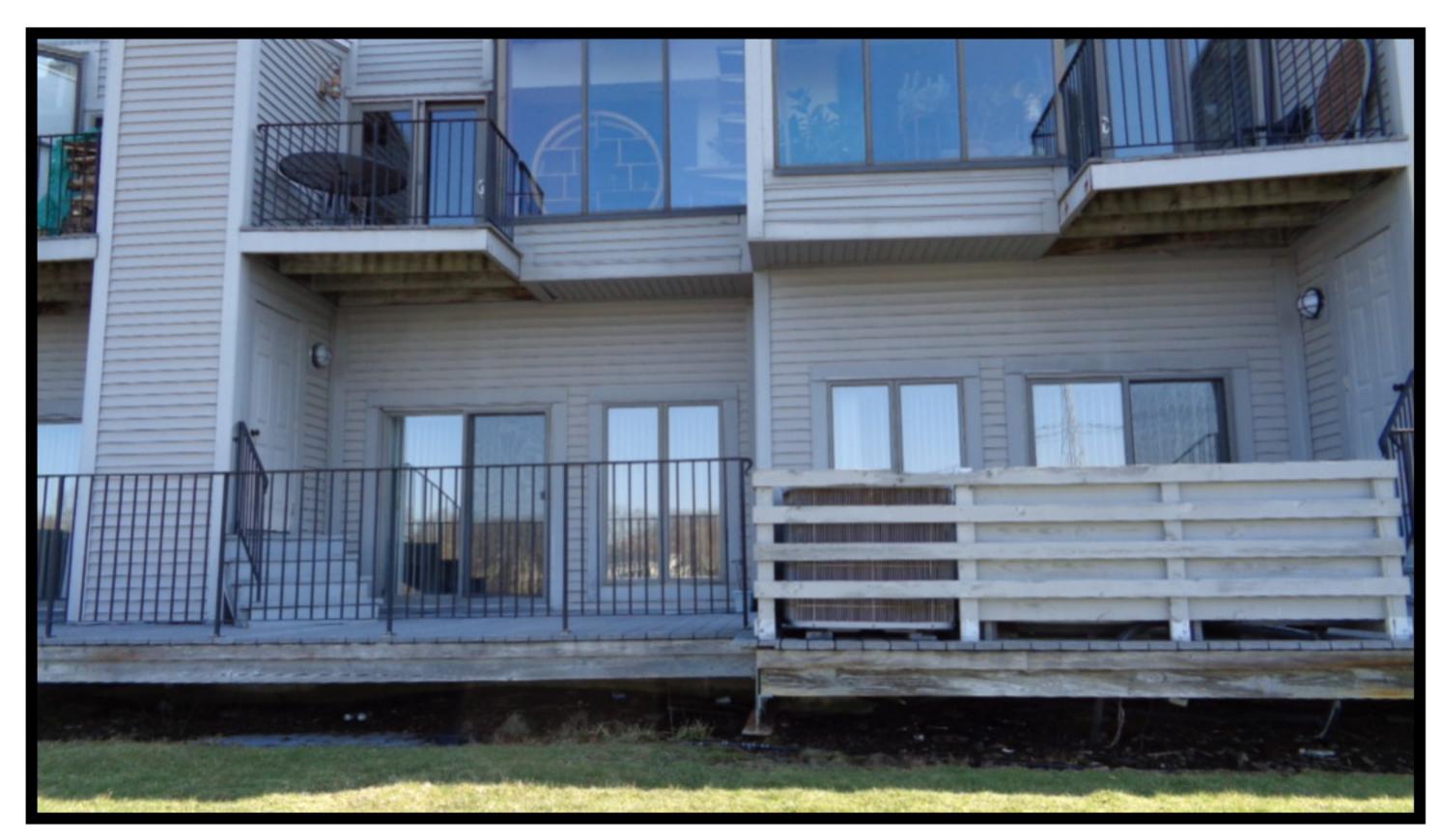




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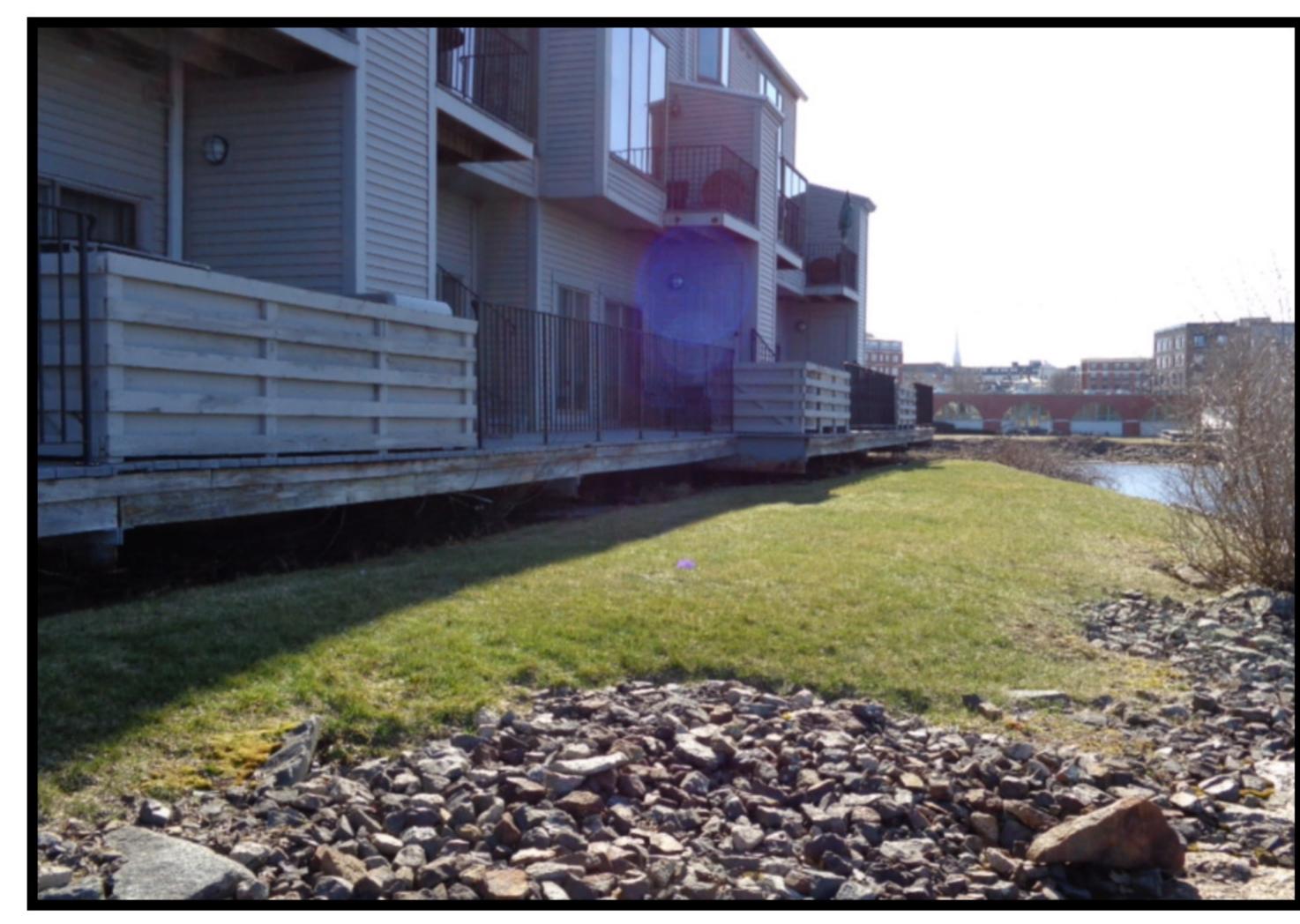
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20089 500 Market St / Portsmouth, NH Photographs taken by Aaron Wilson, P.E.

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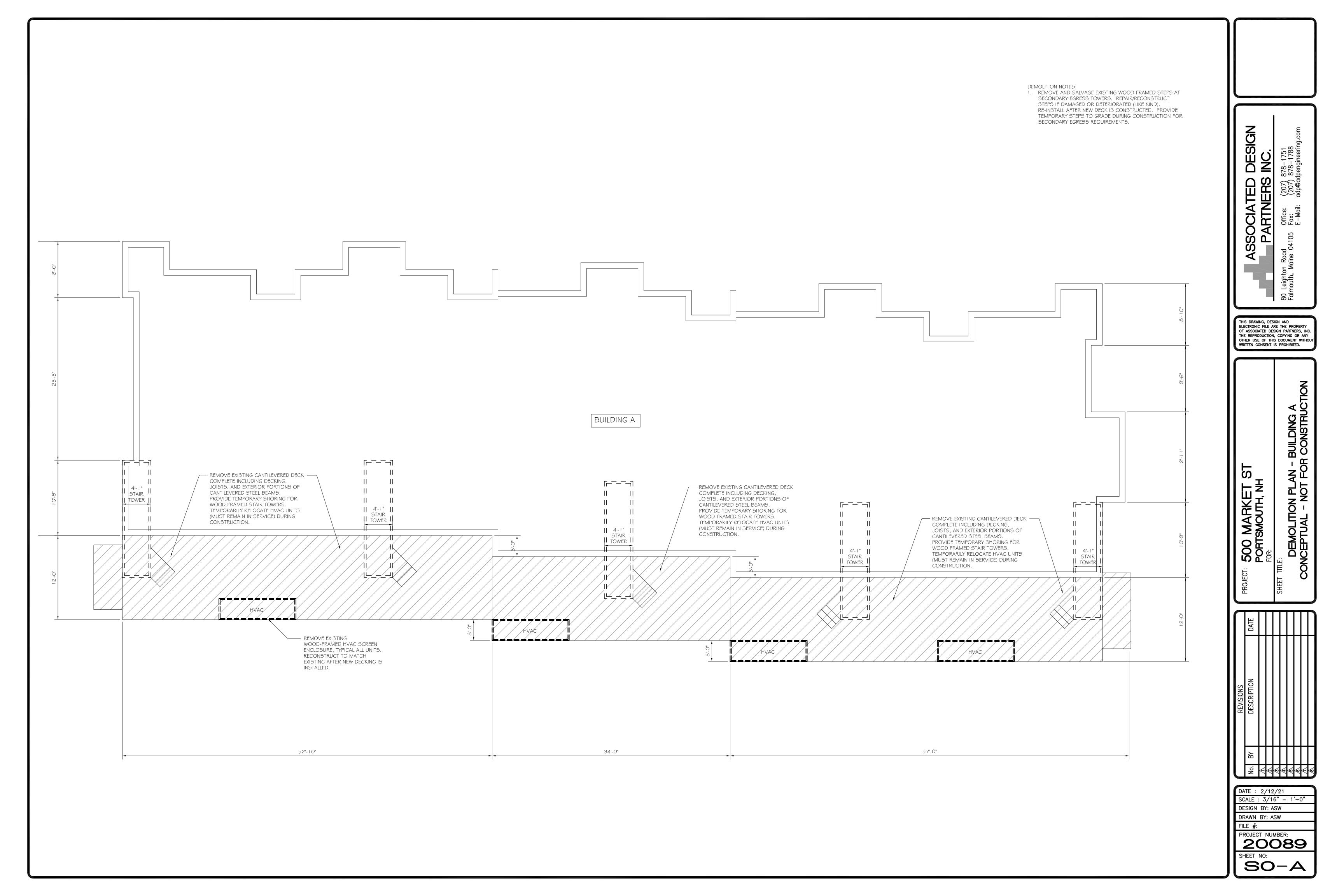


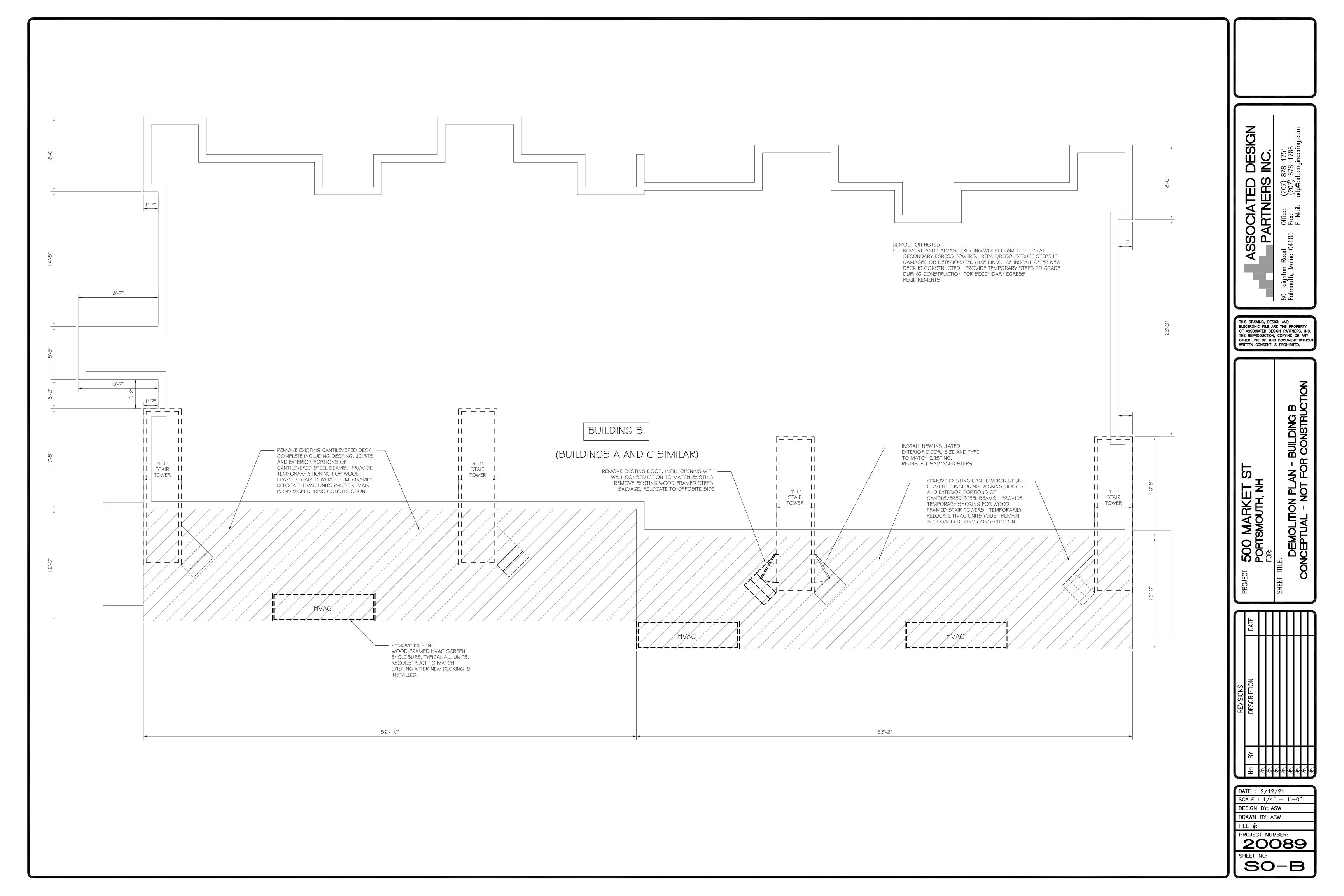
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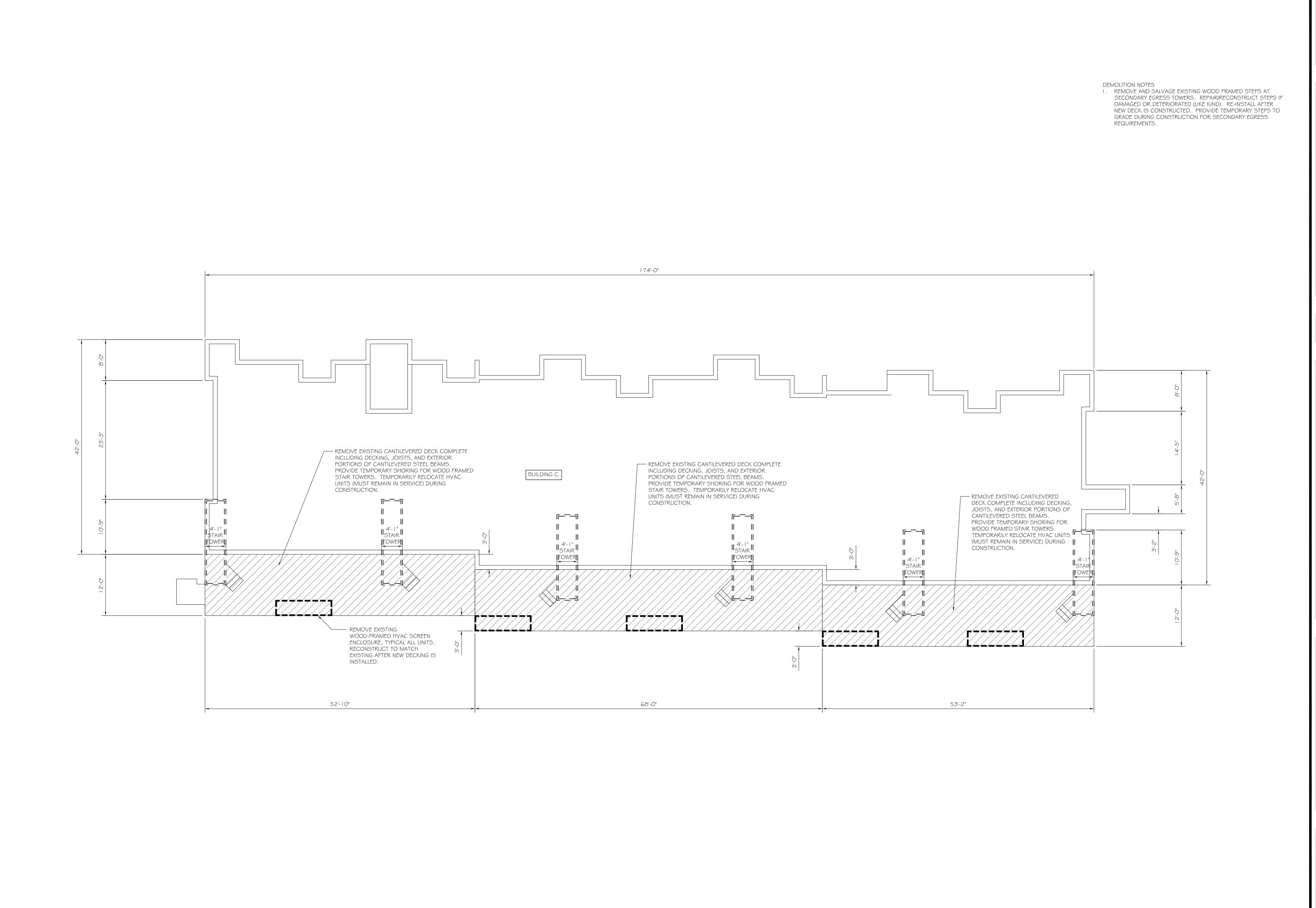




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DEMOLITION PLAN - BUILDING CEPTUAL - NOT FOR CONSTR

SHEET TITLE:

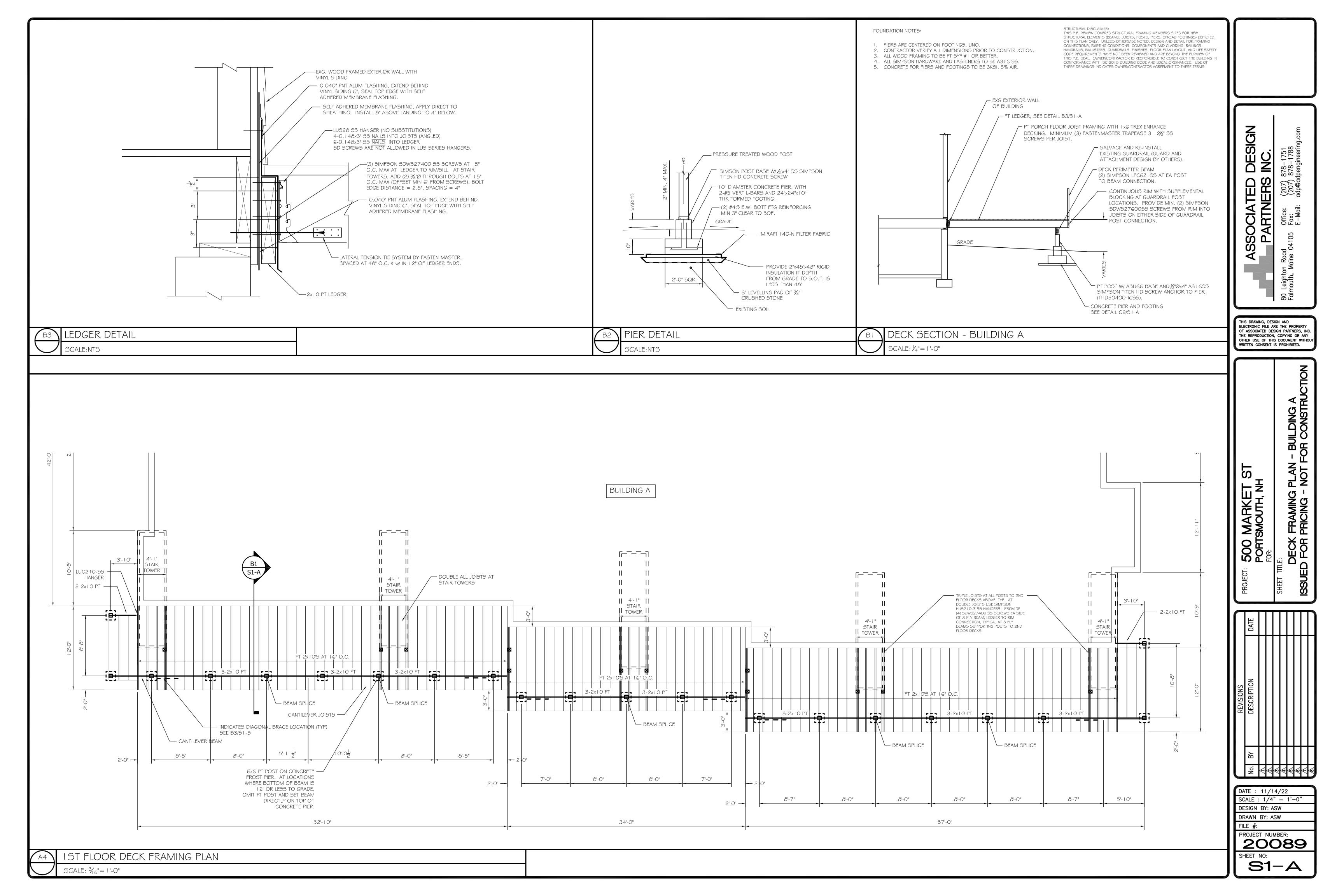
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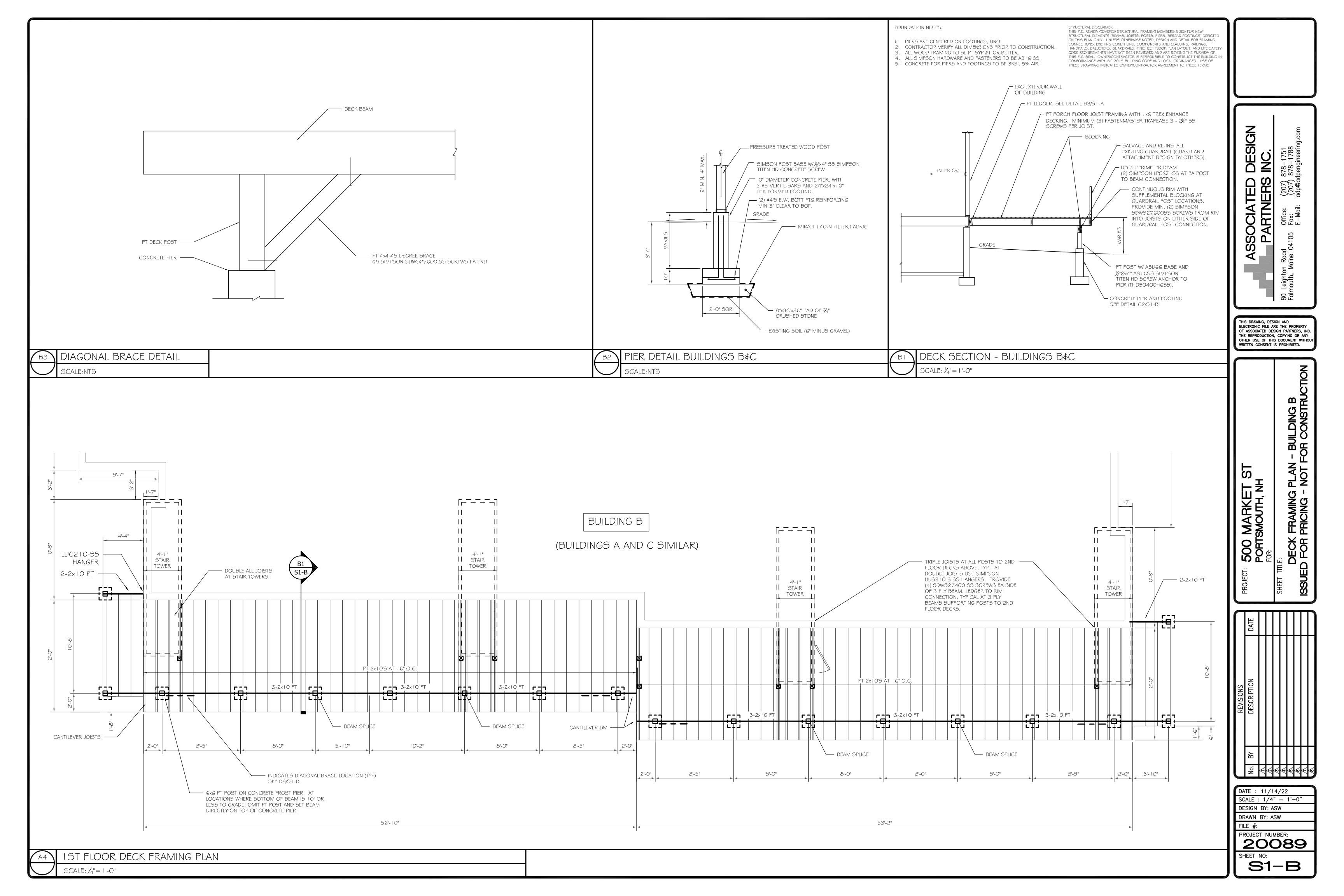
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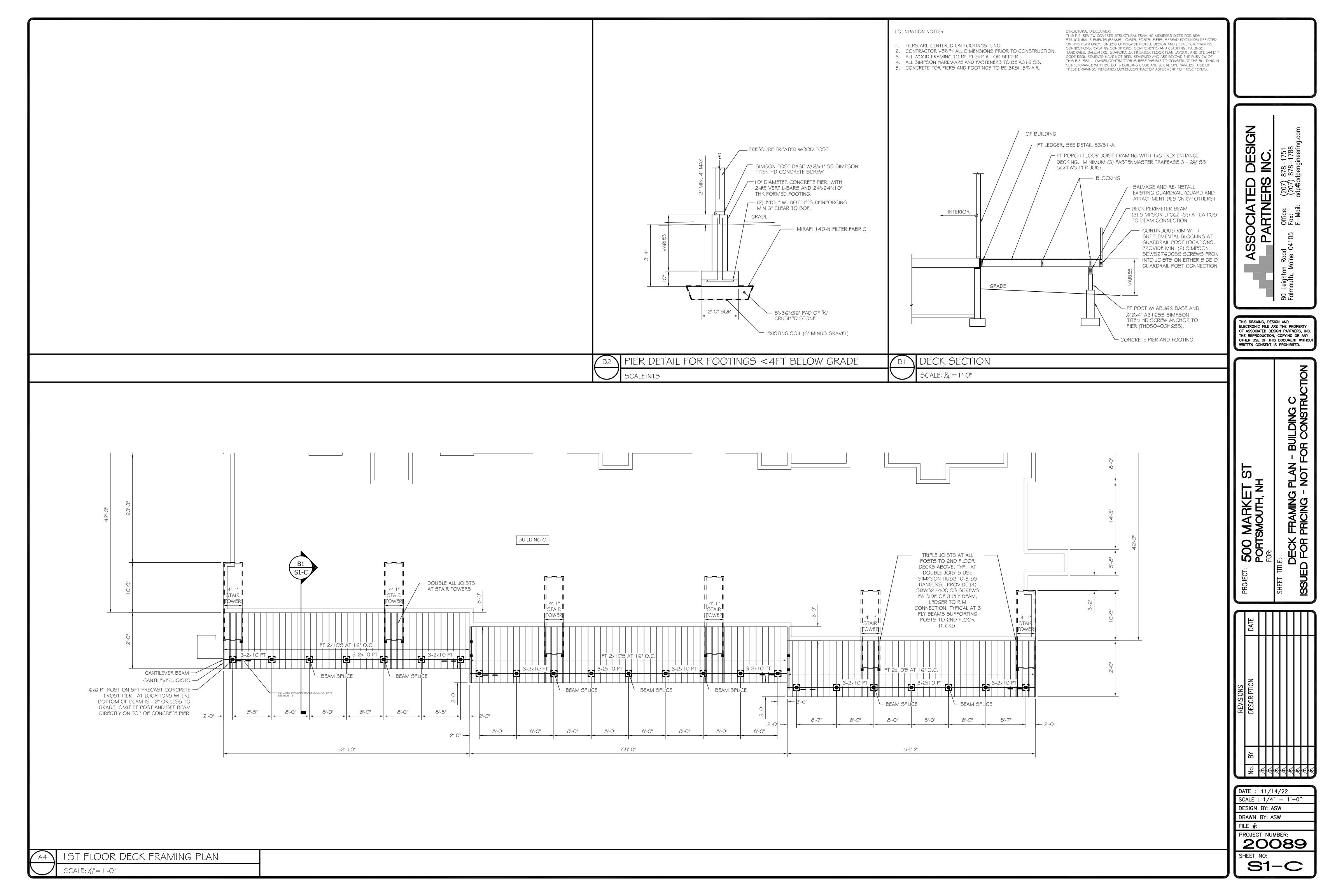
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SCALE: 1/8" = 1'-0"
DESIGN BY: ASW
DRAWN BY: ASW

FILE #:
PROJECT NUMBER:
20089

SHEET NO:







GENERAL STRUCTURAL NOTES

- I. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE STATE AND LOCAL CODES, INCLUDING BUT NOT -HB 1681 / IBC BUILDING CODE 2018 ED
- -ANSI-ASCE 7-16 -ACI 318-14 "BUILDING CODE REQUIREMENTS FOR
- REINFORCED CONCRETE" -ACI 30 I "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"
- -AISC STEEL CONSTRUCTION MANUAL 14TH ED ASD -AISI S I 00- I 2 COLD FORMED STEEL DESIGN SPECIFICATION -ANSI-AWC NDS-2015 NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION WITH

2. DESIGN LOADS

2.1. GRAVITY FLOOR DESIGN LOADS: SNOW LOAD: $P_q = 50psf$, I = 1.0, Ct = 1.2, Ce = 1.0. Pf= 42PSF AT FLAT SURFACES

DECK JOISTS ΔLL=SPAN/360, ΔTL=SPAN/240

- DEAD LOAD 10 PSF DECK LIVE LOAD = 100PSF DEFLECTION CRITERIA:
- 2.2. LATERAL WIND: V=115MPH, EXP D, CAT II BUILDING, Kd=0.85, Kz=1.0, Kzt=1.0, OPEN BUILDING, Qh=34.2 PSF.

2.3. LATERAL - SEISMIC:

- $S_5=0.327$, $S_1=0.075$, $S_1TE=D$, $F_0=1.0$, $S_0=0.336$ Sd | =0.1 | 9, |=1.0, SDC=C, LIGHT FRAMED WOOD BRACING, R=6.5, Ω o=2.5, Cd = 4, V=0.05W
- 3. CONTRACTOR SHALL BRING TO THE ATTENTION OF THE ENGINEER ANY CONDITIONS DIFFERENT FROM THOSE SHOWN ON THE DRAWINGS AND ALSO ANY CONDITIONS THAT PREVENT THE CONTRACTOR'S COMPLETION OF THE WORK AS SHOWN ON THE CONSTRUCTION DRAWINGS.
- 4. ALL WORK SHALL BE PERFORMED BY PERSONS QUALIFIED IN THEIR TRADE AND LICENSED TO PRACTICE SUCH TRADE IN THE STATE IN WHICH THE PROJECT IS LOCATED.
- 5. THESE DRAWINGS SHALL BE USED IN CONJUNCTION WITH ANY ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, IN ADDITION TO SPECIFICATIONS AND ANY SHOP DRAWINGS PROVIDED BY SUBCONTRACTORS AND SUPPLIERS.
- 6. ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS SHALL BE VERIFIED IN THE FIELD BY GENERAL CONTRACTOR (G.C.) AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.
- 7. UNLESS OTHERWISE NOTED, DETAILS, SECTIONS, AND NOTES SHOWN ON ANY DRAWING SHALL BE CONSIDERED TYPICAL FOR ALL SIMILAR DETAILS.
- 8. THESE DRAWINGS DO NOT SHOW SIZE, LOCATION OR TYPE OF OPENING IN THE FOUNDATION SYSTEM FOR ELECTRICAL, PLUMBING OR MECHANICAL EQUIPMENT. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING THESE
- 9. ALL SHOP DRAWINGS PROVIDED BY OTHERS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION OF MATERIAL OR THE PURCHASE OF NON-RETURNABLE STOCK. DIMENSIONAL REVIEW IS THE CONTRACTOR'S RESPONSIBILITY.

WOOD FRAMING NOTES

I. STRUCTURAL LUMBER: No. I SYP OR BETTER, PRESSURE

2. DESIGN CODES:

- A. NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION BY THE NATIONAL FOREST PRODUCTS ASSOCIATION, 2015 ED.
- 3. FASTENERS: COMPLY WITH IBC 2018 TABLE 2304.9.1 FASTENING SCHEDULE.

EARTHWORK NOTES

- I. SITE WORK AND CONCRETE CONTRACTORS ARE REQUIRED TO REVIEW THE ONSITE SUBSURFACE SOIL CONDITIONS WITH THE SER AT THE START OF INITIAL CONSTRUCTION. SITE CONTRACTOR WILL NOTIFY SER AFTER EXCAVATION HAS STARTED AND PRIOR TO THE PLACEMENT OF ANY STRUCTURAL
- 2. REMOVE ALL TOPSOIL AND UNCONTROLLED FILL FOR THE AREAS RECEIVING BUILDING FOUNDATIONS.
- 3. BACKFILL TO THE NECESSARY SUBGRADES REQUIRED ON THE STRUCTURAL FOUNDATION PLANS WITH CONTROLLED STRUCTURAL FILL MATERIAL MEETING THE FOLLOWING **GRADATION:**

PERCENT PASSING	SCREEN OR SIEVE SI
6	100
3	90-100
NO. 4	35-70
NO. 40	5-35
NO. 200	0-5

- 4. PLACE CONTROLLED STRUCTURAL FILL IN UNIFORM LIFTS AND COMPACT TO A MINIMUM OF 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D | 557 "MODIFIED PROCTOR DENSITY".
- 5. PROVIDE SITE GRADING AROUND THE PERIMETER OF THE BUILDING TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE FOUNDATION DURING AND AFTER CONSTRUCTION .
- 6. MAINTAIN THE INTEGRITY OF NATURAL SOILS AND CONTROLLED STRUCTURAL FILLS DURING CONSTRUCTION. PROTECT FOOTING AND STRUCTURE SUBGRADES AGAINST FREEZING AND EXCESSIVE WETTING. REMOVE AND REFILL FROZEN SUBGRADES, MOISTURE CONDITION, OR REPLACE EXCESSIVELY WET SUBGRADE MATERIALS.
- 7. NOTIFY ENGINEER TO OBSERVE SUBGRADES PRIOR TO PLACING FOOTINGS. FOOTINGS ARE DESIGNED FOR A MIN. SOIL BEARING CAPACITY OF 2000PSF, OR FOR BEARING ON SOUND LEDGE.
- 8. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IF LEDGE IS ENCOUNTERED TO DETERMINE PINNING REQUIREMENTS.
- 9. ALL FOOTINGS SHALL EXTEND A MINIMUM OF 4'-6" BELOW EXTERIOR FINISHED GRADE, OR BE DOWELED TO LEDGE
- 10. PROOF ROLL SUBGRADE PRIOR TO SLAB CONSTRUCTION. PROVIDE STRUCTURAL FILL MEETING THE GRADATION SPECIFIED HEREIN FOR FILL MATERIALS BELOW THE SLAB, MAXIMUM PERCENT PASSING 200 SIEVE = 5%.
- II. COMPACT CONTROLLED STRUCTURAL FILLS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE AND ASTM D1557. USE ONLY HAND-OPERATED EQUIPMENT ADJACENT TO WALLS. FILL BOTH SIDES OF WALLS TO EQUAL ELEVATIONS BEFORE COMPACTING.

DEGREE OF COMPACTION: COMPACT TO THE FOLLOWING MINIMUM DENSITIES:

FILL AND BACKFILL LOCATION	DENSITY
UNDER STRUCTURE FOUNDATIONS	95% OF N
TOP 2 FEET UNDER PAVEMENT	95%
BELOW TOP 2 FEET UNDER PAVEMENT	92%
TRENCHES THROUGH UNPAVED AREAS	90%
EMBANKMENTS	90%
PIPE BEDDING	92%
BESIDE STRUCTURE FOUNDATION WALLS,	
TANK WALLS AND RETAINING WALLS	90%
UNDER PIPES THROUGH STRUCTURAL FILLS	90%
UNDER DRAIN FILTER SAND	92%

MAXIMUM DENSITY: ASTMD | 557, MODIFIED.

FIELD DENSITY TESTS: ASTMD | 556 (SAND CONE) ASTMD2167 (RUBBER BALLOON), OR ASTMD2922 (NUCLEAR METHODS)

12. CONTRACTOR IS REQUIRED TO CONFORM TO OSHA (29 PART 1926.650-652) SUBPART P "CONSTRUCTION STANDARD FOR EXCAVATIONS".

CONCRETE NOTES

FOR BUILDINGS"

1.2 FIELD QUALITY CONTROL

REINFORCED CONCRETE"

OF STANDARD PRACTICE"

CU. YD OR FRACTION THEREOF.

FEWER THAN FIVE ARE USED.

COMPLY WITH THE FOLLOWING LATEST EDITIONS AND CURRENT

1.1 ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE

1.3 CRSI "CONCRETE REINFORCING STEEL INSTITUTE, MANUAL

TESTING AGENCY: CONTRACTOR WILL ENGAGE A QUALIFIED INDEPENDENT

TESTING FOR QUALITY CONTROL MAY INCLUDE THOSE SPECIFIED IN THIS

A. TESTING SERVICES: TESTING OF COMPOSITE SAMPLES OF FRESH CONCRETE OBTAINED ACCORDING TO ASTM C 172 SHALL BE PERFORMED ACCORDING TO THE FOLLOWING REQUIREMENTS:

TESTING AND INSPECTING AGENCY TO SAMPLE MATERIALS, PERFORM TESTS,

AND SUBMIT TEST REPORTS DURING CONCRETE PLACEMENT. SAMPLING AND

I. TESTING FREQUENCY: OBTAIN ONE COMPOSITE SAMPLE FOR EACH DAY'S POUR OF EACH CONCRETE MIX EXCEEDING 5 CU. YD, BUT LESS THAN 25 CU. YD, PLUS ONE SET FOR EACH ADDITIONAL 50

a. WHEN FREQUENCY OF TESTING WILL PROVIDE FEWER THAN FIVE

COMPRESSIVE-STRENGTH TESTS FOR EACH CONCRETE MIX, TESTING SHALL BE CONDUCTED FROM AT LEAST FIVE

RANDOMLY SELECTED BATCHES OR FROM EACH BATCH IF

1.2 ACI 318 "BUILDING CODE REQUIREMENTS FOR

I. CODES:

TESTING:

CONCRETE NOTES (CONT).

- 1. SLUMP: ASTM C 143; ONE TEST AT POINT OF PLACEMENT FOR EACH COMPOSITE SAMPLE, BUT NOT LESS THAN ONE TEST FOR EACH DAY'S POUR OF EACH CONCRETE MIX. PERFORM ADDITIONAL TESTS WHEN CONCRETE CONSISTENCY APPEARS TO CHANGE.
- 2. AIR CONTENT: ASTM C 231, PRESSURE METHOD, FOR NORMAL-WEIGHT CONCRETE; ASTM C 173, VOLUMETRIC METHOD, FOR STRUCTURAL LIGHTWEIGHT CONCRETE; ONE TEST FOR EACH COMPOSITE SAMPLE, BUT NOT LESS THAN ONE TEST FOR EACH DAY'S POUR OF EACH CONCRETE MIX.
- 3. CONCRETE TEMPERATURE: ASTM C 1064; ONE TEST HOURLY WHEN AIR TEMPERATURE IS 40 DEG F AND BELOW AND WHEN 80 DEG F AND ABOVE, AND ONE TEST FOR EACH COMPOSITE SAMPLE. 4. COMPRESSION TEST SPECIMENS: ASTM C 31/C 31M; CAST AND LABORATORY CURE ONE SET OF FOUR STANDARD CYLINDER
- 5. COMPRESSIVE-STRENGTH TESTS: ASTM C 39; TEST TWO LABORATORY-CURED SPECIMENS AT 7 DAYS AND TWO AT 28 DAYS. B. STRENGTH OF EACH CONCRETE MIX WILL BE SATISFACTORY IF EVERY AVERAGE OF ANY THREE CONSECUTIVE COMPRESSIVE-STRENGTH TESTS EQUALS OR EXCEEDS SPECIFIED COMPRESSIVE STRENGTH AND NO COMPRESSIVE-STRENGTH TEST VALUE FALLS BELOW SPECIFIED

SPECIMENS FOR EACH COMPOSITE SAMPLE.

- COMPRESSIVE STRENGTH BY MORE THAN 500 PSI. C. CHECK SLAB FOR COMPLIANCE WITH SPECIFIED FLOOR FLATNESS TOLERANCES IN ACCORDANCE WITH ASTM E 1155.
- D. TEST RESULTS SHALL BE REPORTED IN WRITING TO ENGINEER, CONCRETE MANUFACTURER, AND CONTRACTOR WITHIN 48 HOURS OF TESTING. REPORTS OF COMPRESSIVE-STRENGTH TESTS SHALL CONTAIN PROJECT IDENTIFICATION NAME AND NUMBER, DATE OF CONCRETE PLACEMENT, NAME OF CONCRETE TESTING AND INSPECTING AGENCY, LOCATION OF CONCRETE BATCH IN WORK, DESIGN COMPRESSIVE STRENGTH AT 28 DAYS, CONCRETE MIX PROPORTIONS AND MATERIALS, COMPRESSIVE BREAKING STRENGTH, AND TYPE OF BREAK FOR BOTH 7-AND 28-DAY TESTS
- E. NONDESTRUCTIVE TESTING: IMPACT HAMMER, SONOSCOPE, OR OTHER NONDESTRUCTIVE DEVICE MAY BE PERMITTED BY ENGINEER BUT WILL NOT BE USED AS SOLE BASIS FOR APPROVAL OR REJECTION OF
- CONCRETE. CORE TESTS WILL BE REQUIRED F. ADDITIONAL TESTS: TESTING AND INSPECTING AGENCY SHALL MAKE ADDITIONAL TESTS OF CONCRETE WHEN TEST RESULTS INDICATE THAT SLUMP, AIR ENTRAINMENT, COMPRESSIVE STRENGTHS, OR OTHER REQUIREMENTS HAVE NOT BEEN MET, AS DIRECTED BY ENGINEER. TESTING AND INSPECTING AGENCY MAY CONDUCT TESTS TO DETERMINE ADEQUACY OF CONCRETE BY CORED CYLINDERS COMPLYING WITH ASTM C 42 OR BY OTHER METHODS AS DIRECTED BY ENGINEER.

3. SUBMITTALS:

- A. PRODUCT DATA: FOR EACH TYPE OF MANUFACTURED MATERIAL AND PRODUCT INDICATED. B. DESIGN MIXES: FOR EACH CONCRETE MIX. INCLUDE ALTERNATE MIX
- DESIGNS WHEN CHARACTERISTICS OF MATERIALS, PROJECT CONDITIONS, WEATHER, TEST RESULTS, OR OTHER CIRCUMSTANCES WARRANT ADJUSTMENTS I. INDICATE AMOUNTS OF MIX WATER TO BE WITHHELD FOR LATER
- ADDITION AT PROJECT SITE. C. MATERIAL CERTIFICATES: SIGNED BY MANUFACTURERS CERTIFYING THAT EACH OF THE FOLLOWING ITEMS COMPLIES WITH
- REQUIREMENTS: I.CEMENTITIOUS MATERIALS AND AGGREGATES. ADMIXTURES.
- 3. CURING MATERIALS 4. CONCRETE REINFORCING BARS.
- I. SUBMIT FOR RECORD, A WRITTEN PLAN OF THE FIELD PROCEDURES TO BE IMPLEMENTED FOR COLD WEATHER PROTECTION.

4. MATERIALS:

- 4.1 REINFORCING STEEL: GRADE 60, ASTM 615, NEW
- DEFORMED BARS. 4.2 REINFORCING FOR SLABS: SEE PLAN
- 4.3 MIXING WATER SHALL BE POTABLE, FREE OF ANY SUBSTANCES THAT MAY BE DELETRIOUS TO THE CONCRETE OR REINFORCING STEEL.

5. CONCRETE MIX:

5.1 PIERS AND FOOTINGS: -CEMENT SHALL BE ASTM 150, TYPE II PORTLAND CEMENT -28 DAY COMPRESSIVE STRENGTH: 3000 PSI - MAX AGGREGATE SIZE: 3/4" -AIR CONTENT: 5% + 1% BY VOLUME -MAX WATER-CEMENT RATIO: 0.50 -AGGREGATE SHALL CONFORM TO ASTM C33

5.3 ADMIXTURES:

- PROVIDE ADMIXTURES WHICH ARE CHEMICALLY COMPATIBLE FOR THEIR INTENDED USE. COMPLY WITH MANUFACTURER'S INSTRUCTIONS FOR USE. BASE DOSAGE RATES ON CEMENT CONTENT. CALCIUM CHLORIDE IS NOT ALLOWED.
- 5.3.1 MID-RANGE WATER REDUCERS : EQUAL TO DARACEM 55 BY GCP, ASTM C-494.
- 5.3.2 ACCELERATORS: EQUAL TO DARASET 200 BY GCP, ASTM C-494 TYPE C.
- 5.3.3 AIR ENTRANCING: EQUAL TO "DARAVAIR 1000" BY GCP, ASTM C-260 AND ARMY CORPS CRD-C-13.

5.4 CONCRETE SURFACE COATINGS:

5.4.1 BITUMINOUS DAMPPROOFING: EQUAL TO BRUSH GRADE FOUNDATION COATING BY EUCLID (EXTERIOR WALLS ONLY).

5.5 FORMS AND RELATED MATERIAL:

A NON-STAINING TYPE.

5.5.1 FORMS FOR CONCRETE SURFACES THAT WILL BE EXPOSED IN THE FINISHED BUILDING SHALL BE PLYFORM CLASS I, B-B EXTERIOR TYPE CONFORMING TO U.S. PRODUCT STANDARD PS I. FORMS FOR CONCRETE SURFACES NOT EXPOSED IN THE FINISHED BUILDING MAY BE PLYFORM OR MATCHED LUMBER. 5.5.2 FORM OIL USED ON SURFACE OF FORMS SHALL BE

CONCRETE NOTES (CONT).

5.6 ALUMINUM PRODUCTS:

- 5.6.1 NO ALUMINUM CONDUIT, PIPE, INSERTS, REGLETS. ETC. SHALL BE PLACED IN ANY CONCRETE, UNLESS COATED WITH BITUMINOUS DAMPPROOFING.
- 5.6.2 NO EQUIPMENT MADE OF ALUMINUM OR ALUMINUM ALLOYS SHALL BE USED FOR PUMP LINES, TREMIES OR CHUTES IN CONVEYING CONCRETE TO POINT OF PLACEMENT.

5.7 GROUT:

5.7.1 NON-SHRINK GROUT FOR USE UNDER COLUMN BASE PLATES AND BEAM BEARING PLATES SHALL BE EMBECO GROUT #885, PRE-MIXED, AS MANUFACTURED BY MASTER BUILDERS, OR APPROVED EQUIVALENT.

5.8 PREFORMED EXPANSION JOINT FILLER:

5.8.1 A NON-EXTENDING AND RESILIENT BITUMINOUS TYPE JOINT FILLER, 1/2" THICK.

5.9 EMBEDDED ITEMS:

5.9.1 EMBEDDED ITEMS SUCH AS ANCHOR BOLTS. ETC.. SHALL BE INSTALLED USING A TEMPLATE AND BE SECURELY HELD IN PLACE DURING CONCRETE

5.10 SPACERS, SUPPORTS AND FASTENERS:

5.10.1 FORM SPACERS, REINFORCING TIES AND CHAIRS, AND OTHER DEVICES NEEDED FOR PROPERLY SPACING, SUPPORTING, AND FASTENING REINFORCEMENET SHALL BE PROVIDED. CLAY BRICKS ARE NOT ALLOWED FOR USE AS SLAB STEEL BOLSTERS.

5.11 VAPOR BARRIER:

5.11.1 UNDERSLAB MOISTURE VAPOR BARRIER SHALL BE MADE OF A LAYER OF 6 MIL. POLYETHYLENE PLASTIC. PLACE VAPOR BARRIER OVER SUB-GRADE, DIRECTLY UNDER SLAB.

6. CONSTRUCTION PRACTICES:

6.1 REINFORCEMENT:

- COMPLY WITH REQUIREMENTS OF CRSI, LATEST EDITION.
- 6.1.1 MINIMUM CONCRETE COVER: 3" FOR CONCRETE CAST AGAINST SOIL; 2" FOR OTHER CONCRETE, UNLESS OTHERWISE SHOWN.

6.2 DEVELOPMENT AND SPLICING:

PROVIDE DEVELOPMENT AND TENSION LAP SPLICE LENGTHS IN ACCORDANCE WITH THE FOLLOWING, UNLESS NOTED OTHERWISE ON PLANS:

DEVELOPMENT		CLASS C*
BAR SIZE	LENGTH*	LAP SPLICE
#4	24"	24"
#5	32"	32"
#6	3 <i>8</i> "	38"
#7	44"	44"
#8	50"	50"

*INCREASE BY 30% FOR BARS SPACED <6".

6.3 CHAMFERS:

CHAMFER ALL EXPOSED EDGES AND CORNERS OF CONCRETE 1/2" OR I " SIMILAR THROUGHOUT.

6.4 JOINTS:

- 6.4. I CONSTRUCTION JOINTS: PLACE PERPENDICULAR TO THE MAIN REINFORCEMENT. CONTINUE REINFORCEMENT ACROSS CONSTRUCTION JOINTS. PROVIDE KEYWAYS AT LEAST 1 1/2" (UNLESS OTHERWISE SHOWN) DEEP IN CONSTRUCTION JOINTS IN WALLS, SLAB, AND BETWEEN WALLS AND FOOTINGS. ACCEPTED BULKHEADS DESIGNED FOR THIS PURPOSE MAY BE USED IN SLABS. PROVIDE WATERSTOP WHERE INDICATED.
- 6.4.2 ISOLATION JOINTS: PROVIDE IN SLABS-ON-GRADE AT POINTS OF CONTACT BETWEEN SLABS-ON-GRADE AND VERTICAL SURFACES, SUCH AS FOUNDATION WALLS, GRADE BEAMS, COLUMN PEDESTALS, AND ELSEWHERE AS NECESSARY.
- 6.4.3 CONTRACTION (CONTROL) JOINT: PROVIDE IN SLABS-ON-GRADE BY SAW CUTTING TO A DEPTH OF 1/4 THE SLAB THICKNESS. PROVIDE A ONE PART ELASTOMERIC JOINT SEALANT TO JOINT GROOVE, A MINIMUM OF 60 DAYS AFTER SLAB PLACEMENT UNLESS OTHERWISE APPROVED. SEE PLAN FOR JOINT LAYOUT.

6.5 CONCRETE MIXING:

- 6.5.1 READY-MIXED CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH THE
- REQUIREMENTS SET FORTH IN ASTM C94. 6.5.2 ALL CONCRETE SHALL BE MIXED UNTIL THERE IS A UNIFORM DISTRIBUTION OF THE MATERIALS BEFORE DISCHARGE. THE MIXING SHALL BE CONTINUOUS AFTER THE WATER HAS BEEN
- ADDED TO THE MIX IN THE DRUM. 6.5.3 NO CONCRETE SHALL BE PLACED IN THE FORMS MORE THAN 90 MINUTES AFTER THE WATER HAS BEEN ADDED.
- 6.5.4 AFTER THE MAXIMUM WATER CEMENT RATIO HAS BEEN ACHIEVED, RETEMPERING OF THE CONCRETE WILL NOT BE ALLOWED, UNLESS APPROVED BY ENGINEER.

CONCRETE NOTES (CONT).

6.6 CONCRETE PLACEMENT:

- 6.6.1 DEPOSIT CONCRETE CONTINUOUSLY IN LAYERS NOT DEEPER THAN 24" OVER PREVIOUS LAYERS WHICH ARE STILL PLASTIC. AVOID COLD JOINTS. CONSOLIDATE CONCRETE BY MECHANICAL VIBRATING EQUIPMENT, SUPPLEMENTED BY HAND-SPACING, RODDING AND TAMPING. DO NOT USE MECHANICAL VIBRATORS TO TRANSPORT CONCRETE.
- 6.6.2 HOT-WEATHER PLACEMENT: PLACE CONCRETE ACCORDING TO RECOMMENDATIONS IN ACI 305R AND AS FOLLOWS, WHEN HOT-WEATHER CONDITIONS EXIST: 6.6.2.1 COOLINGREDIENTS BEFORE MIXING TO MAINTAIN CONCRETE TEMPERATURE BELOW 90 DEG F AT TIME OF PLACEMENT. CHILLED MIXING WATER OR CHOPPED ICE MAY BE USED TO CONTROL TEMPERATURE, PROVIDED WATER EQUIVALENT OF ICE IS CALCULATED TO TOTAL AMOUNT OF MIXING WATER. USING LIQUID NITROGEN TO COOL CONCRETE IS CONTRACTOR'S OPTION.
- 6.6.2.2 COVER STEEL REINFORCEMENT WITH WATER-SOAKED BURLAP SO STEEL TEMPERATURE WILL NOT EXCEED AMBIENT AIR TEMPERATURE IMMEDIATELY BEFORE EMBEDDING IN CONCRETE. 6.6.2.3 FOG-SPRAY FORMS, STEEL REINFORCEMENT, AND SUBGRADE JUST BEFORE PLACING CONCRETE.

KEEP SUBGRADE MOISTURE UNIFORM WITHOUT

STANDING WATER, SOFT SPOTS, OR DRY AREAS. 6.6.3 COLD-WEATHER PLACEMENT: COMPLY WITH ACI 306.1

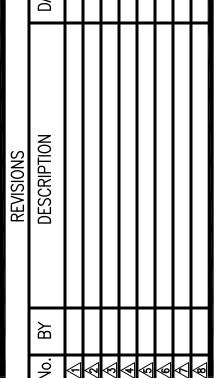
- AND AS FOLLOWS. 6.6.3. I PROTECT CONCRETE WORK FROM PHYSICAL DAMAGE OR REDUCED STRENGTH THAT COULD BE CAUSED BY FROST, FREEZING ACTIONS, OR
- LOW TEMPERATURES. 6.6.3.2 WHEN AIR TEMPERATURE HAS FALLEN TO OR IS EXPECTED TO FALL BELOW 40 DEG F, UNIFORMLY HEAT WATER AND AGGREGATES BEFORE MIXING TO OBTAIN A CONCRETE MIXTURE TEMPERATURE OF NOT LESS THAN 50 DEG F AND NOT MORE THAN 80 DEG F AT POINT OF PLACEMENT.
- 6.6.3.3 DO NOT USE FROZEN MATERIALS OR MATERIALS CONTAINING ICE OR SNOW. DO NOT PLACE CONCRETE ON FROZEN SUBGRADE OR ON SUBGRADE CONTAINING FROZEN MATERIALS.
- 6.6.3.4 DO NOT USE CALCIUM CHLORIDE, SALT, OR OTHER MATERIALS CONTAINING ANTIFREEZE AGENTS OR CHEMICAL ACCELERATORS, UNLESS OTHERWISE SPECIFIED AND APPROVED IN MIX DESIGNS.

6.7 CONCRETE CURING:

- 6.7.1 SLABS: USE MOISTURE (WET) CURE PROCEDURES
- 6.7.2 FORMED SURFACES: CURE FORMED SURFACES WITH FORMS IN PLACE FOR ENTIRE CURING PERIOD, UNLESS ALTERNATE METHODS ARE APPROVED BY THE ENGINEER. CONTACT STRUCTURAL ENGINEER @ 207-878-1751FOR ALTERNATIVE CURING METHODS. DURING COLD WEATHER CURING, PROVIDE CAST-IN THERMOMETERS FOR MONITORING CONCRETE CURING TEMPERATURE AT LOCATIONS AS DIRECTED BY ENGINEER. MAINTAIN A 50°F WITH USE OF INDIRECT HEAT OR INSULATIVE BLANKETS.
- 6.8 ANCHOR BOLTS: USE TYPE, SIZE, AND LENGTH AS INDICATED ON PLANS.

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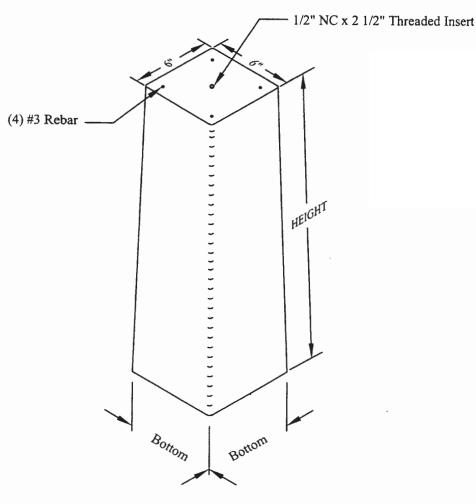


DATE : 11/14/22 | SCALE : 1/4" = 1'-0"DESIGN BY: ASW DRAWN BY: ASW

PROJECT NUMBER: 20089



Precast Concrete Piers



ELEVATION

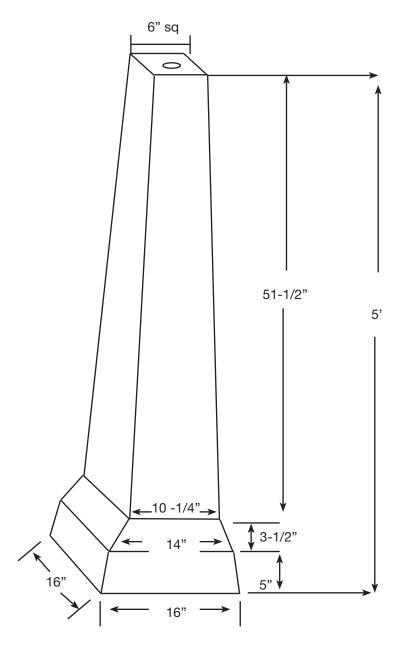
Height (Feet)	Bottom (Inches)	Item #	Weight
4'-0"	9"	21740	230 lbs.
5'-0"	10"	21750	340 lbs.
6'-0"	11"	21760	450 lbs.

DESIGN NOTES:

- 1) Concrete Mix Design is 4,000 PSI standard at 28 days, Type 3 Cement.
- 2) Reinforcing Steel ASTM A 615, Grade 60
- 2) Smooth Finish on all exposed surfaces.



Precast Concrete Deluxe Pier



Design Notes:

- 1. Concrete Mix Desin is 5,000 PSI standard at 28 days, Type 3 Cement.
- 2. Reinforced Steel ASTM A 615, Grade 60.
- 3. Smooth Finish on all exposed surfaces.