SITE PLANNING

(Logistics, Safety, Coordination & Planning)

BRAD NILE, AIA
Andersen Construction

Disclaimer: This Presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.

BRAD NILE

5 decades of building with wood.

35-year construction career.

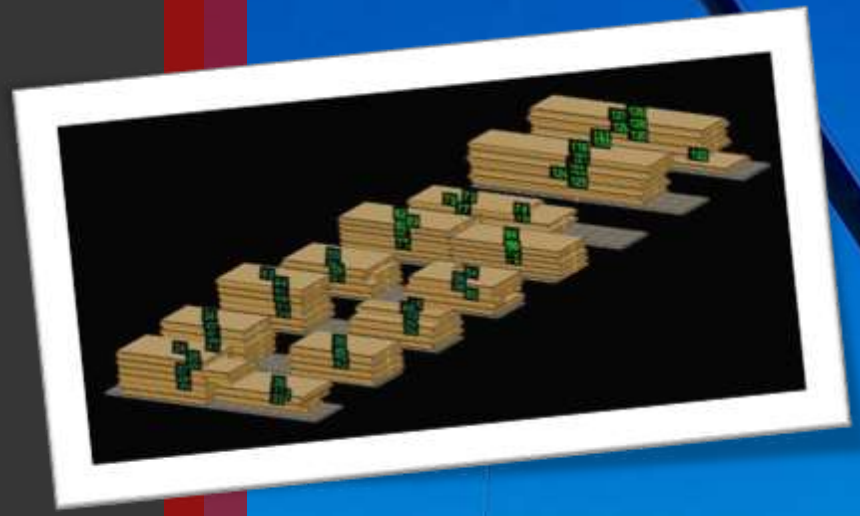
District Office • Portland OR

THE PROMISE OF MASS TIMBER CONSTRUCTION:

- A beautiful building
- Rapid construction
- Minimal staging and laydown needs
- Offsite fabrication potential for all trades

KEY FACTORS IN DELIVERING THIS PROMISE:

- A well managed and planned jobsite
- A well managed mass timber procurement and modeling effort



Corvallis, OR

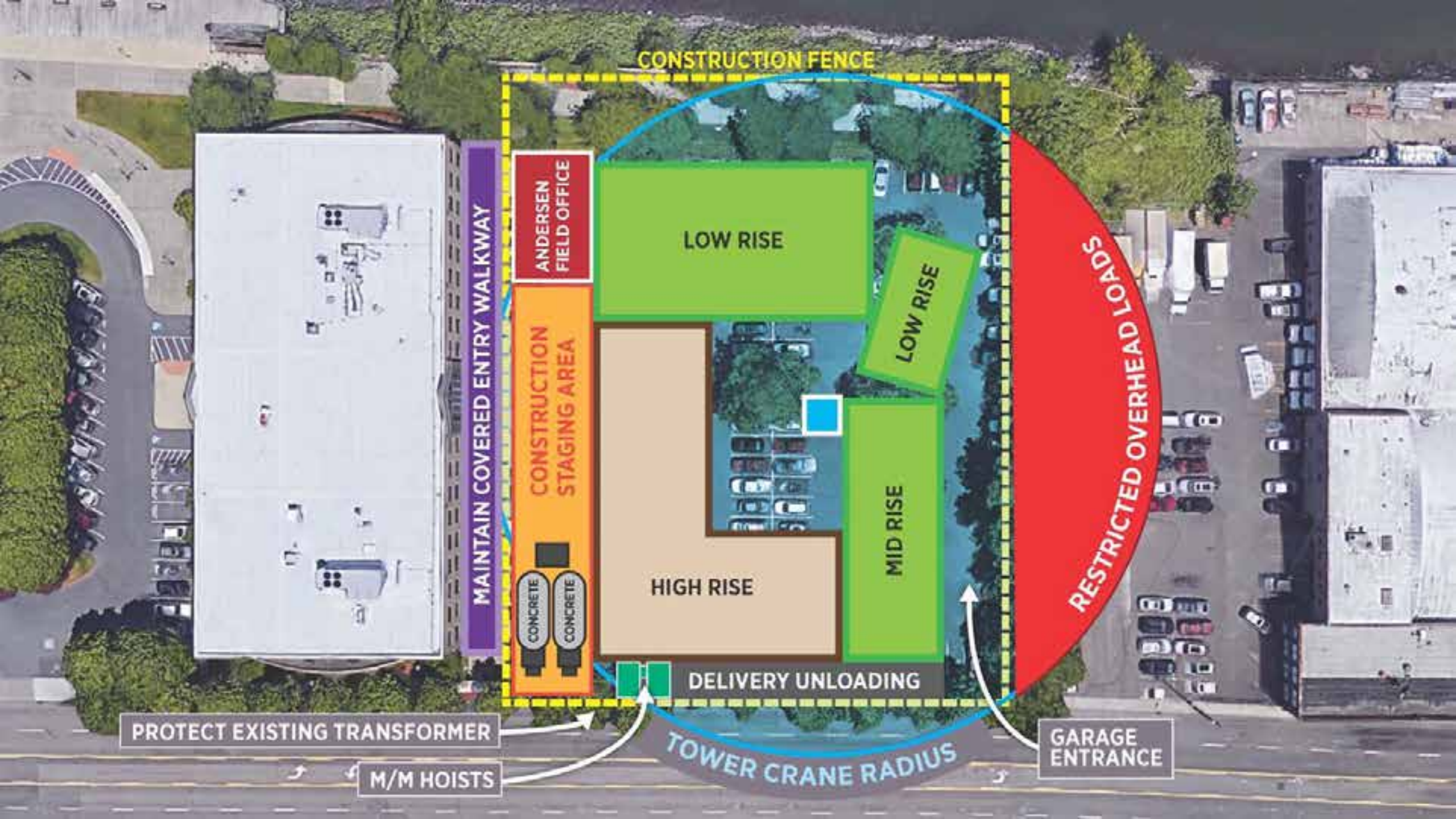
District Office • Portland, OR

SITE ORGANIZATION CONSIDERATIONS:

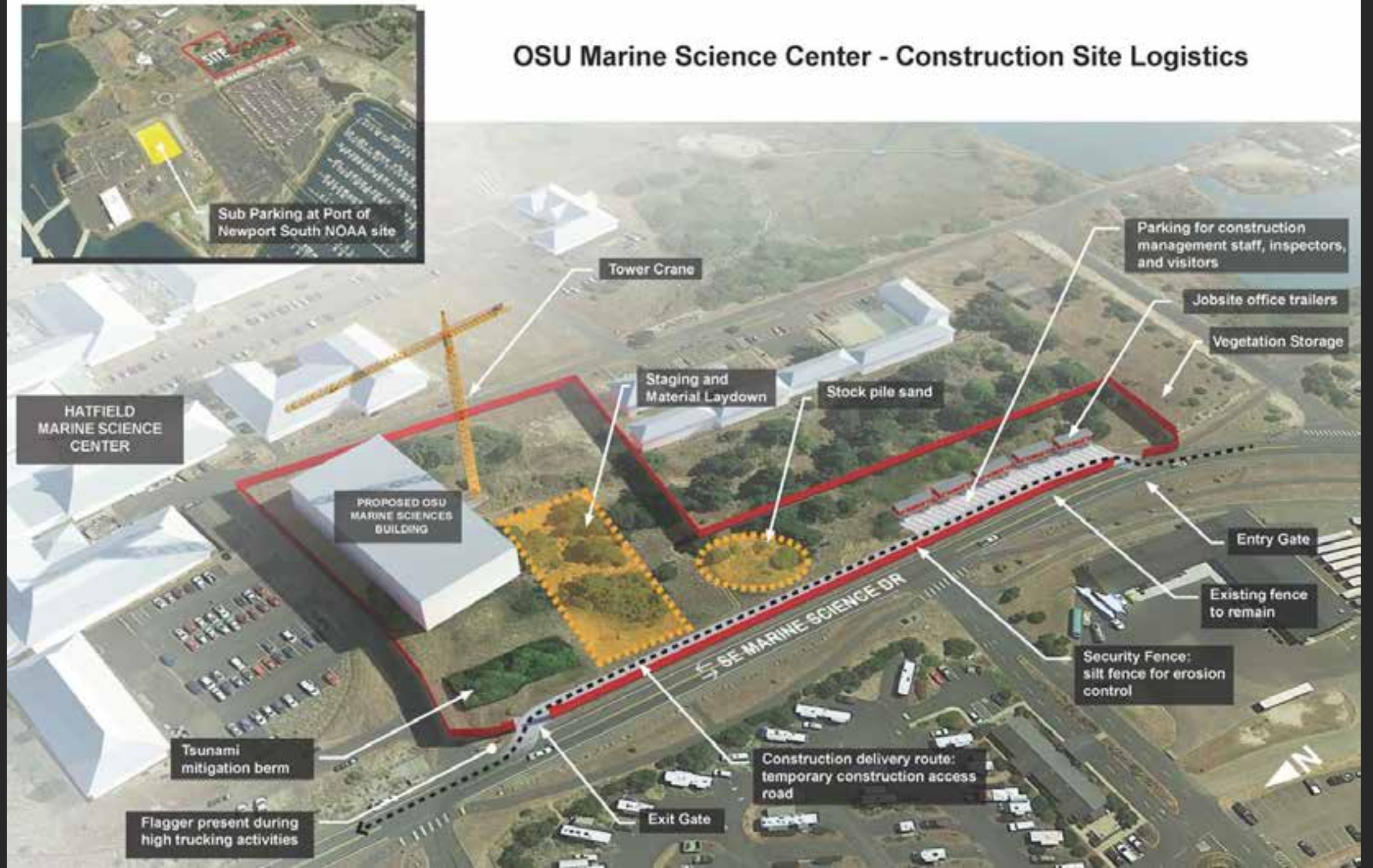
- Building footprint compared to the available site.
- Crane location and hoisting plan
- Truck routing for materials in
- Trash, debris and recycling management

SITE ORGANIZATION

Start planning early. Refine and add every relevant detail.


CONSTRUCTION FENCE
ANDERSEN FIELD OFFICE
LOW RISE
LOW RISE
MAINTAIN COVERED ENTRY WALKWAY
CONSTRUCTION STAGING AREA
CONCRETE
CONCRETE
HIGH RISE
MID RISE
RESTRICTED OVERHEAD LOADS
DELIVERY UNLOADING
PROTECT EXISTING TRANSFORMER
M/M HOISTS
TOWER CRANE RADIUS
GARAGE ENTRANCE

OSU Marine Science Center - Construction Site Logistics



Total perimeter accessibility prepared for crane & facade access

Portland, OR

No available site - all access via sidewalk & street closures.

CRANE PLAN

No available site, except an easement just big enough for a tower crane.

CRANE PLAN

DOWNTOWN SITE

- Full-time sidewalk closure and part time street closure.
- RT crane for positioning flexibility and after-hours tuck away.

PRE-CONSTRUCTION SITE CONSIDERATIONS:

- Street and sidewalk closures
- Pedestrian protection
- No-fly zones
- Hoisting obstructions:
  - ✓ Overhead power lines
  - ✓ Trees
  - ✓ Neighboring buildings
  - ✓ Facade access
  - ✓ Utility connections

PEDESTRIAN PROTECTION

Jurisdictional requirements and readymade options

HOISTING OBSTRUCTIONS

Trees, Power Lines and No-fly zones

FACADE ACCESS EXAMPLES

TIMBER PROCUREMENT PRE-CONSTRUCTION CONSIDERATIONS:

SCHEDULE

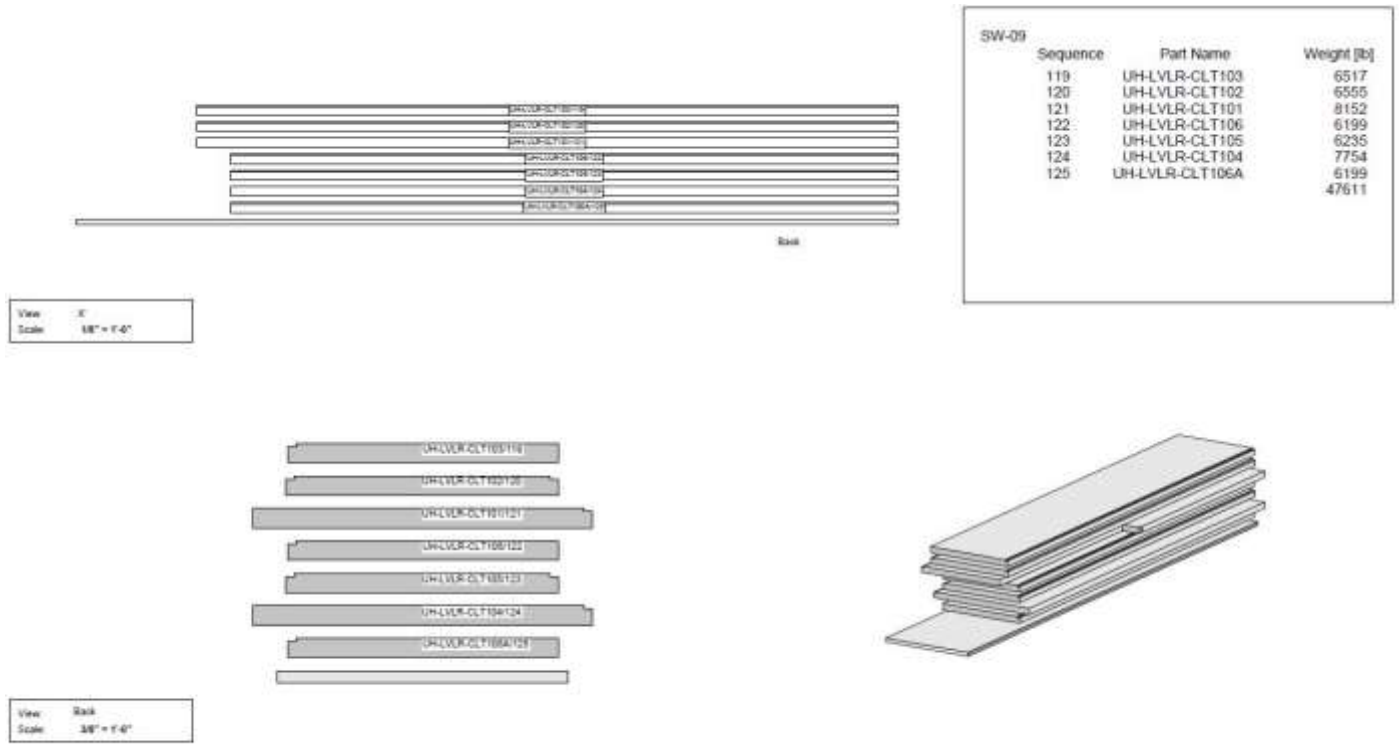
- Adequate time for modeling
- Confirmed Material Delivery Flow

DELIVERY PLANNING

- Truck sequence and cadence
- “Fly from truck” modeling and loading
- Factory center-of-gravity locating
- Hoisting and rigging provisions
- Worker Safety Provisions
- Guardrails

TRUCK LOADING, SEQUENCE & CADENCE PLANNING

(CLT LOAD MODELING EXAMPLE)



SW-09

Sequence	Part Name	Weight [lb]
119	UH-LVLR-CLT103	6517
120	UH-LVLR-CLT102	6555
121	UH-LVLR-CLT101	8152
122	UH-LVLR-CLT106	6199
123	UH-LVLR-CLT105	6235
124	UH-LVLR-CLT104	7754
125	UH-LVLR-CLT106A	6199
		47611

FLY FROM TRUCK MODELING & LOADING

Essepi Systemi X-Lam Near Trento Italy

HOISTING & RIGGING PROVISIONS

Hardware & Center of Gravity Locating

MOISTURE MITIGATION PLANNING

What to remember…

1. Have a plan:
   - Factory Sealers.
   - Stain Control
   - Moisture Control
   - Dry-out planning
   - Finishing
2. Build During the dry months
3. Study the connection details
4. Protect Critical details.
5. Expedite the envelop installation
6. Use a “vented” roof assembly.

Andersen Construction
MASS TIMBER Construction Moisture Management Plan

Plan Components:

1. **Sealers**
2. **Stain Prevention**
3. **Moisture Control**
4. **Dry out**

1. **Sealers at Timber Elements:**
   a. Shop Sealer will be applied to the following elements and surfaces (all sealers hand rolled, not sprayed):
      - CLT ends, edges, cuts
      - Clear sacrificial sealer on top sides of CLT floor panels
      - Glulam Columns and Beams (Sansin KP12-UVW)
   b. NO Shop applied sealer will be applied to the bottom faces of CLT floor panels.
2. **Staining Prevention Measures:**
   a. All CLT and Glulam elements will be wrapped during transportation.
   b. Wrap at timber elements will be removed as soon as they are set in place. (To prevent the trapping of moisture.
   c. Only galvanized steel or painted connectors will be used. No raw steel will be allowed on site (except rebar) once the timber structure is going up.
   d. NO cutting of steel allowed within the wood structure portion of the building. (Cutting in basement is acceptable.)
   e. On site storage:
      - Timber members will be wrapped until installed and be stored off the ground with a secondary cover.
      - Wood stickers will be used between the layers of stacked elements.
3. **Moisture Control:**
   a. Rothoblaas adhesive tape will be installed at all deck seams (CLT to CLT and CLT to plywood) during the course of installation. Tape to also be installed at penetrations in floor panels to prevent water transfer and staining.
   b. Concrete topping slabs will be placed deck by deck closely behind the timber erection. No concrete will be placed on wet timber decks.
   c. The roof panels will have a factory installed sealer. Based on weather conditions during the June installation period, we will evaluate the need for a roof deck vapor barrier. Roof installation will start 28 days after the concrete deck pour. (Note- The roofing product warranty won't allow for installation to start sooner.)
   d. Bulk standing water will be regularly removed from exposed deck areas until the concrete decks are poured.
4. **Dry-out Steps** (as required):
   a. Timber dry out will occur by air circulation without the introduction of heat. Once the building is enclosed, fans to be used to circulate air until all of the timber elements are at 14% moisture content or less.
   b. No timber elements will be covered by drywall until the exterior window are installed, and the timber moisture content is at 14% or less.
   c. Localized heating will only occur in the restroom and first floor areas to accommodate the drywall and paint finishes.
   d. Note: The building will be provided with "freeze protection" heat only. When the full heating of the enclosed building occurs, the humidity will need to be monitored to ensure that excessive checking of the wood does not occur as it is brought up to the final temperature.

MOISTURE MANAGEMENT PLAN SUMMARY

1. Sealers
   All CLT Ends, edges and cuts.
   UV protection on all beams and columns.
2. Stain Prevention
   Only galvanized, aluminum or powder coated connectors.
   NO cutting of steel around raw wood.
   Remove all wrapping once on site.
3. Moisture Control
   Adhesive tape at all joints and seams.
   Regular bulk water removal and management.
   Critical connection protection,.
4. Dry out
   AIR CIRCULATION (With no heat.)
   Add heat slowly only after surface drying is complete.
   Add humidity with heat. (With monitoring.)
   14% moisture content MAX prior to any timber cover.

SUMMARY –

PLAN EARLY & CONTINUOUSLY

- Hoisting
- Worker access and tie-off provisions while the structure is underway
- Guardrail provisions
- Structure temporary bracing & stabilization

PUBLIC SAFETY

- Necessary traffic revisions
- Pedestrian protection

GENERAL ACCESS

- Stair assemblies going up with the structure
- Maintaining 2 paths of egress.

MAXIMIZE OFF-SITE FABRICATION
(BEYOND THE STRUCTURE)

- MEP systems
- Facade Elements

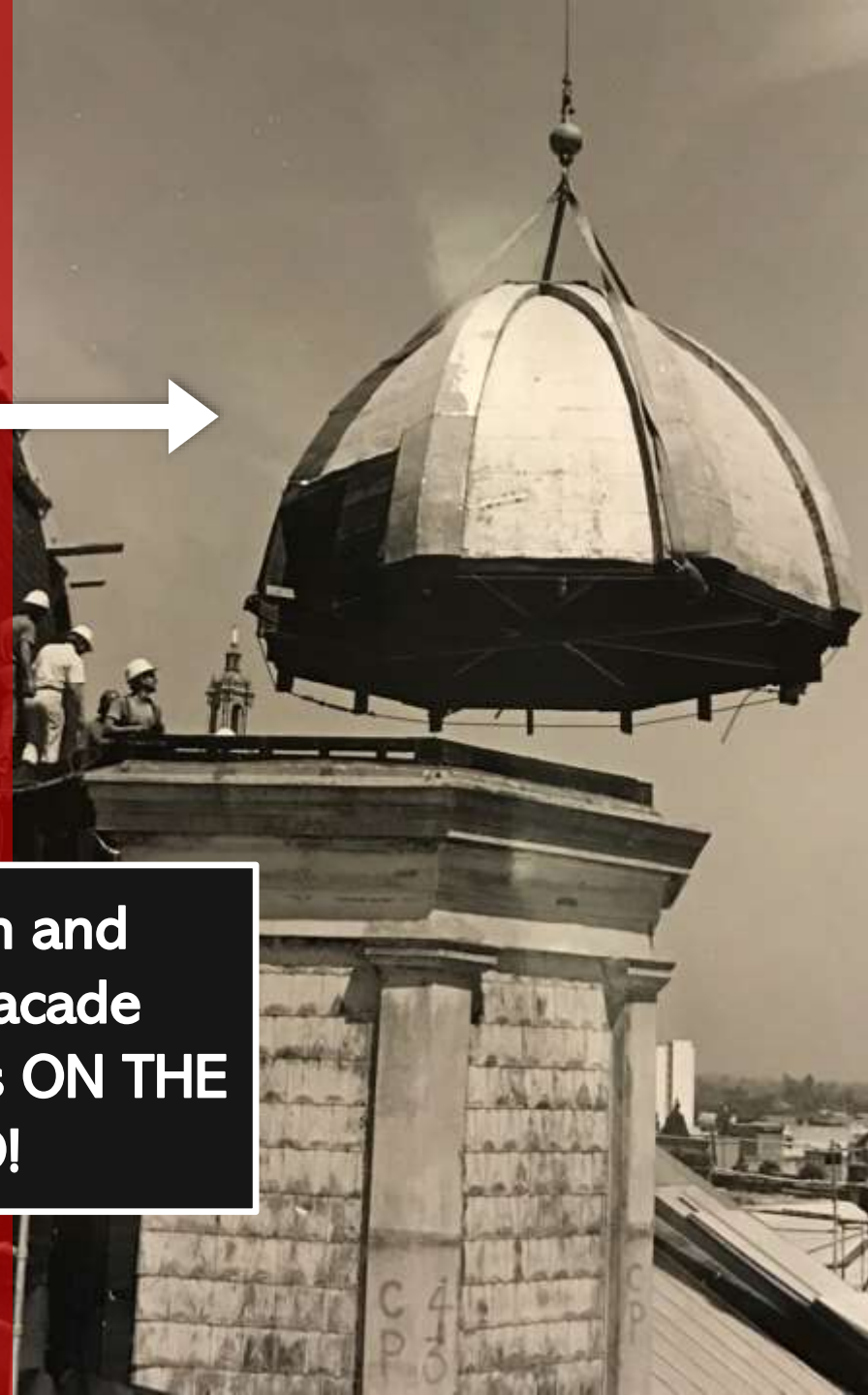
WORKER SAFETY PROVISIONS:

HAVE A PLAN!

San Jose, CA
Dinwiddie Construction

THE 1986 PLAN:

- ✓ Demolish and rebuild facade elements ON THE GROUND!



THE 2019 PLAN:

✓ Maximize off-site fabrication - Prefabricated Facade Panels

Newport, OR

Maximize Off-site Fabrication - Plumbing and Piping Systems.

Working the plan: Prefabricated Wall Elements,
shop installed roof vapor barrier.

North Greenwich, UK

North Greenwich, UK

Working the plan: Ground Installed Edge Protection

CONCLUSION

Plan early and continuously.

- Crane type and location
- Material Flow
- Public Safety
- Temporary Bracing
- Moisture Management
- Model everything.
- Realize a no-sawdust jobsite.
- If it is in the building, it is in the model.
- Model truck loads for direct fly to position.

Maximize off-site fabrication
(Beyond the Structure).

- MEP systems
- Facade Elements

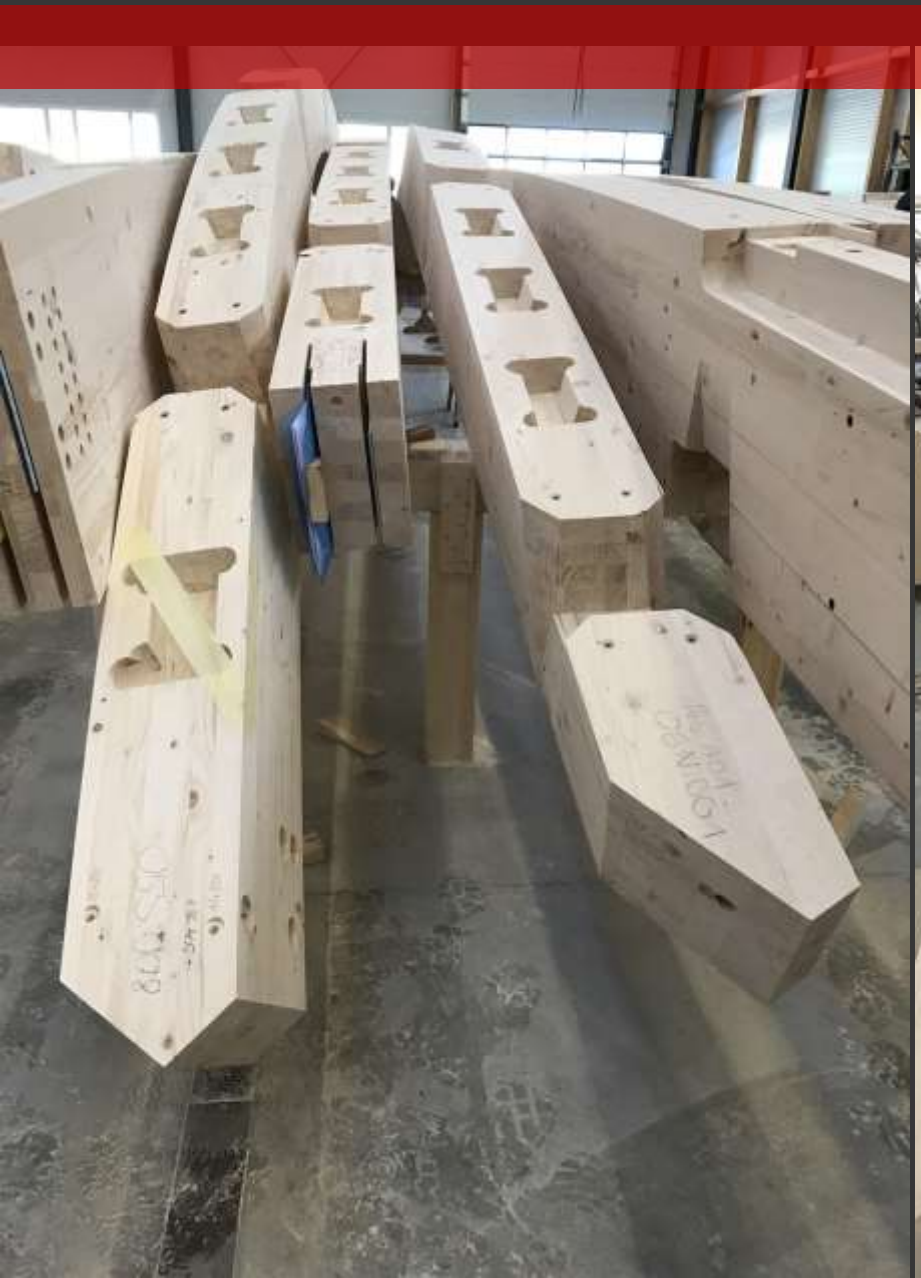
EXCELLENT EXAMPLES OUTSIDE THE USA:

Brock Commons, UBC

Urban One, Structurlam, Seagate

Vancouver, British Columbia

EXCELLENT EXAMPLES OUTSIDE THE USA:



Swatch Omega Headquarters

Blumer Lehmann,

Gossau, Switzerland

Thank you for your participation.

BRAD NILE, AIA
Andersen Construction
bnile@andersen-const.com

QUESTIONS?

This concludes The American Institute of Architects Continuing Education Systems Course

Brad Nile

Andersen Construction

bnile@Andersen-const.com