



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.



1970s



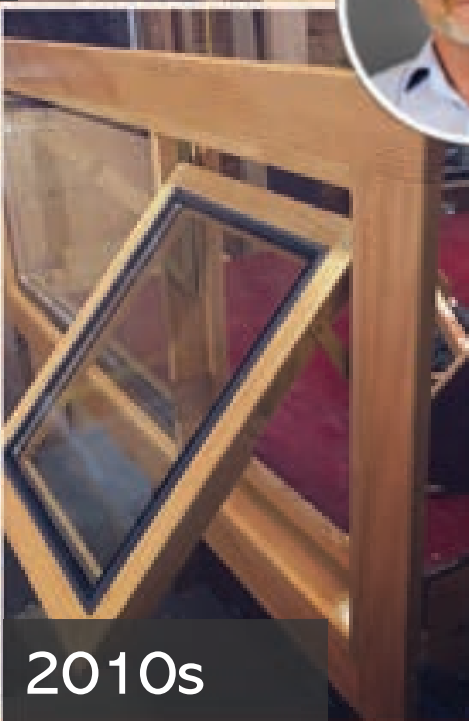
1980s



1990s



2000s



2010s



BRAD NILE

5 decades of
building with
wood.

35-year
construction career.

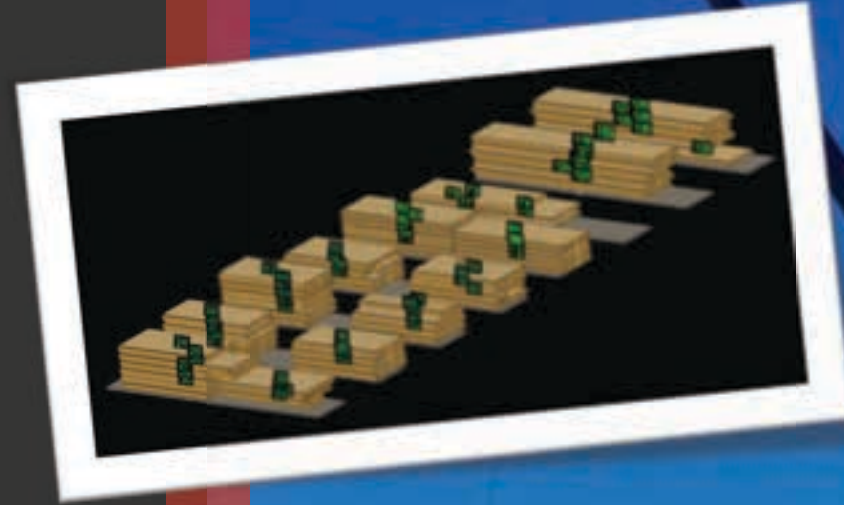


THE PROMISE OF MASS TIMBER CONSTRUCTION:

- 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





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

MAINTAIN COVERED ENTRY WALKWAY

ANDERSEN
FIELD OFFICE

CONSTRUCTION
STAGING AREA

CONCRETE
CONCRETE

LOW RISE

LOW RISE

MID RISE

HIGH RISE

DELIVERY UNLOADING

RESTRICTED OVERHEAD LOADS

GARAGE
ENTRANCE

TOWER CRANE RADIUS

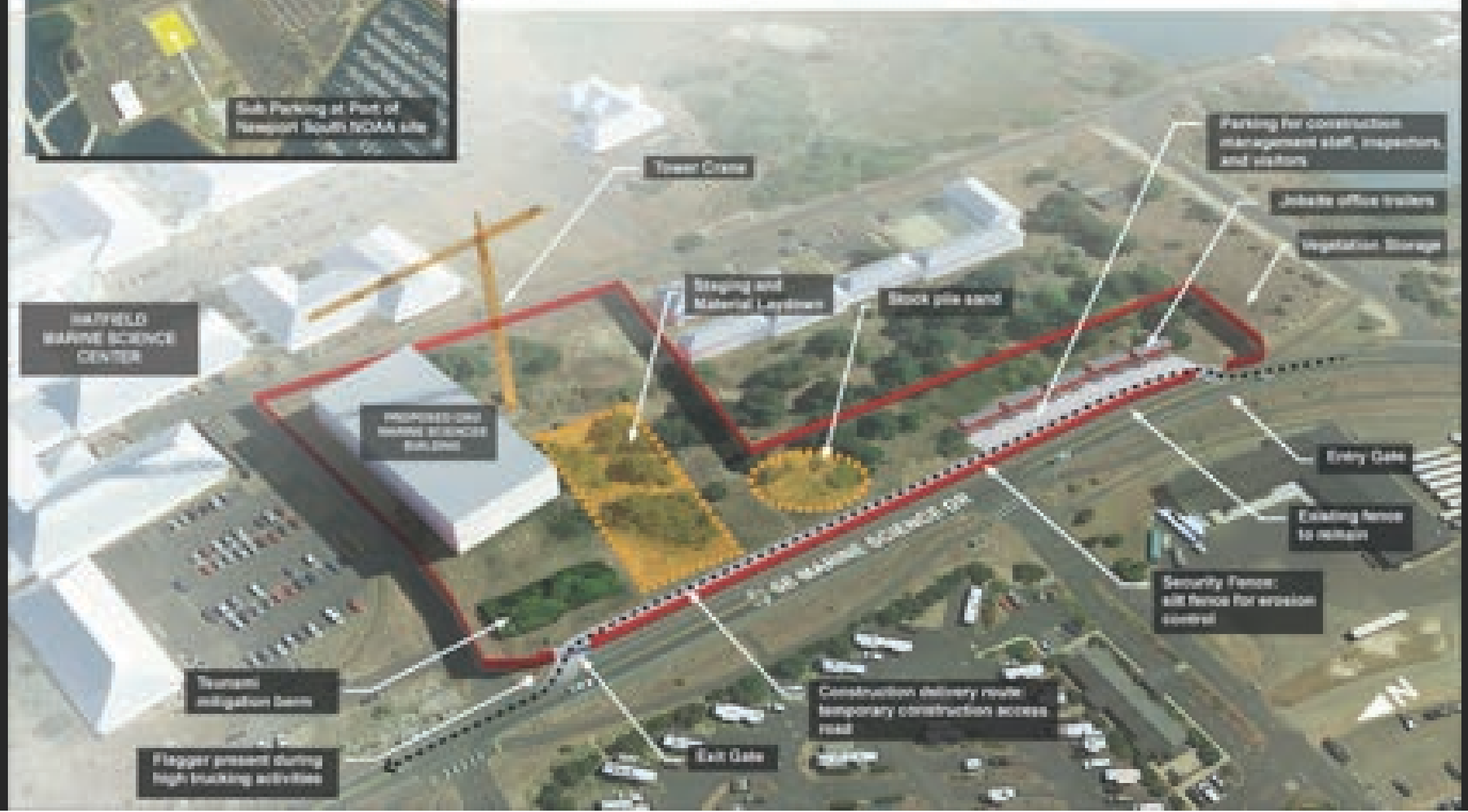
PROTECT EXISTING TRANSFORMER

M/M HOISTS

SITE ORGANIZATION

Early planning should
be iterative and
collaborative.

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

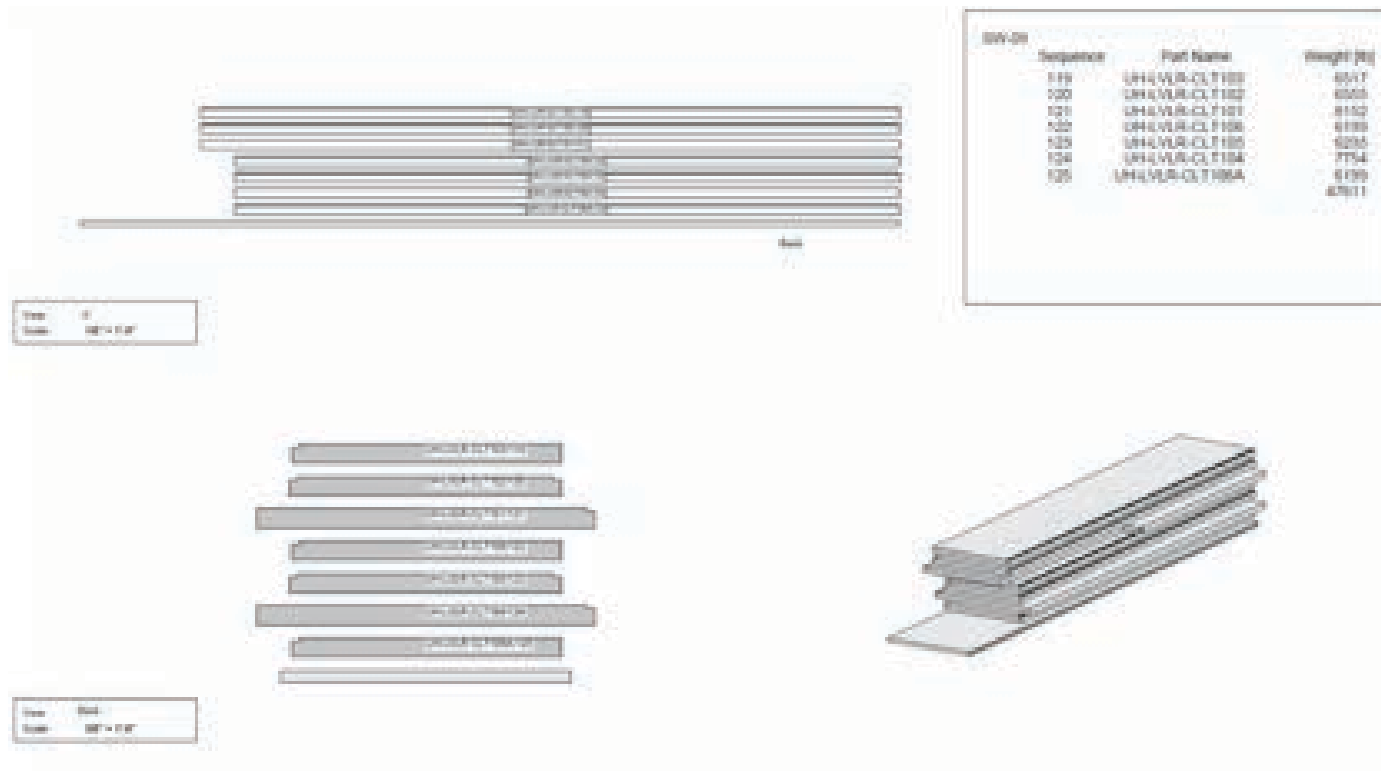
- Adequate time for modeling
- Confirmed Material Delivery Flow

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)



FLY FROM TRUCK MODELING & LOADING



Essepì Sistemi 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.

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 (Sensin XP12-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 windows 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.

SAFETY PLANNING 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



THE 1978 PLAN:

✓ Be careful.

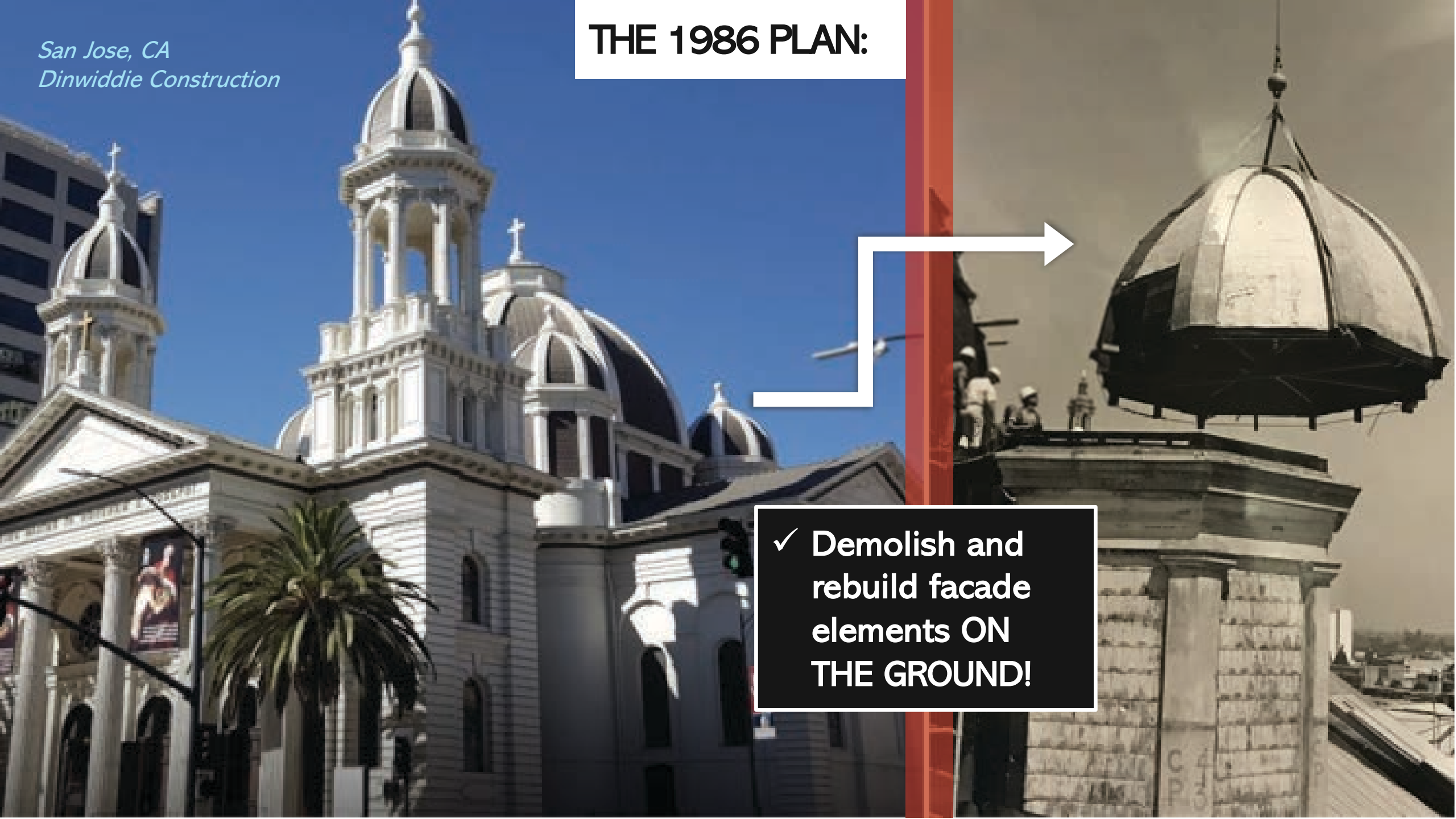
✓ Grab something if you fall.

**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:

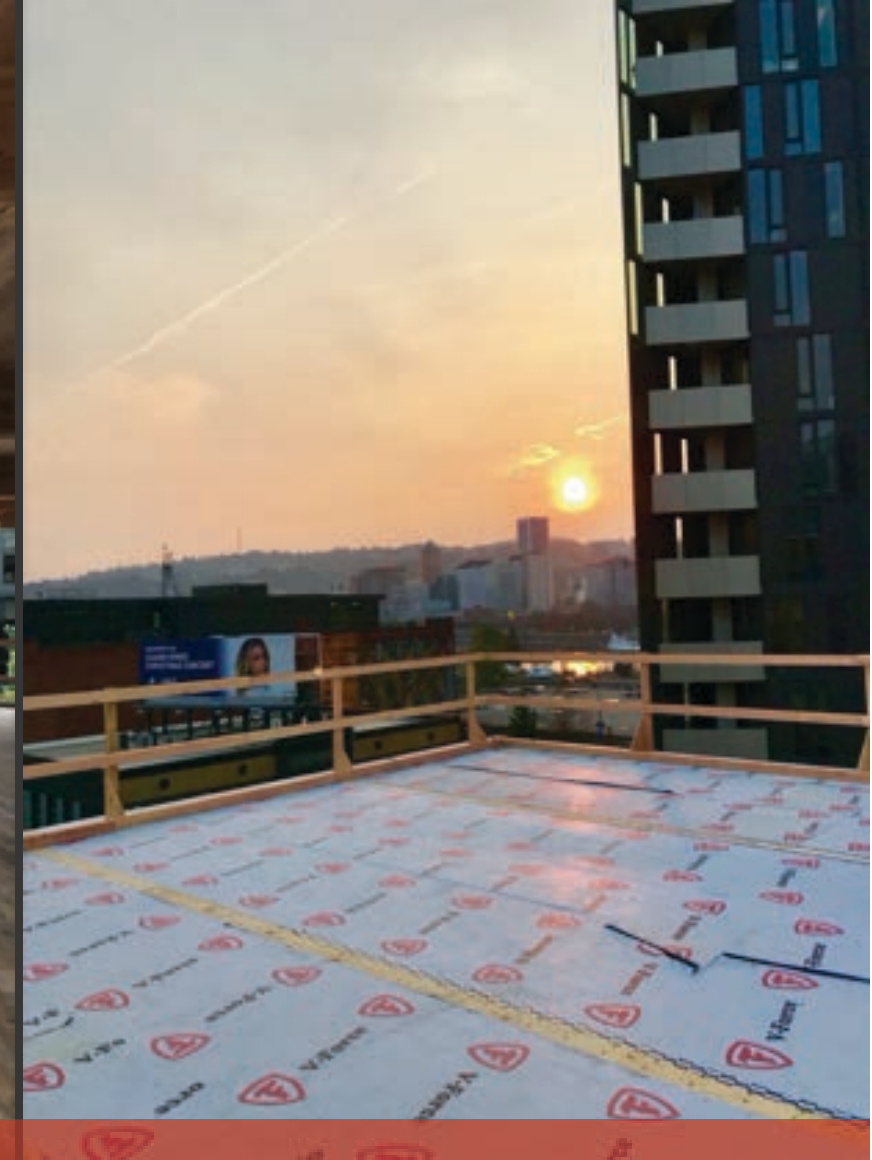


✓ Maximize off-site fabrication - Prefabricated Facade Panels

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.

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