

WELCOME TO: ARCH 2330
BUILDING TECHNOLOGY III

Stairs

Week Five: Class 10

Lecture:

- a. Stairs characteristics and placement
- b. Detailing stairs
- c. Stair ADA and code issues
- d. The stairs assignment

Lab [Computer Topics]:

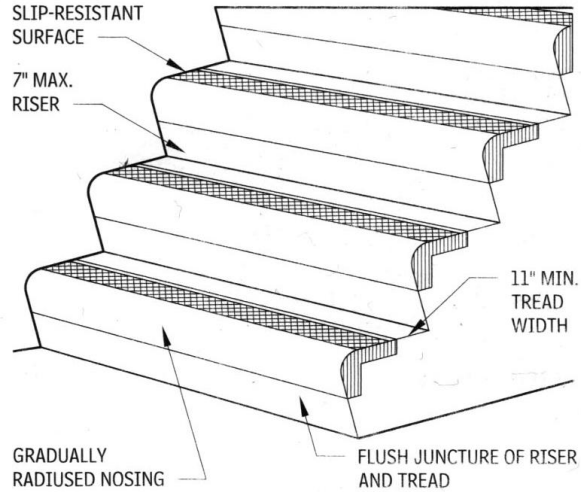
- a. South stair;
 - i. Placing typical stairs
 - ii. Lobby – second floor stairs
 - iii. Lobby – cellar stairs
 - iv. Roof - stairs
- b. North stair (repeat the above process)

Architect: Peter Geusebroek
Location: Amsterdam, The Netherlands

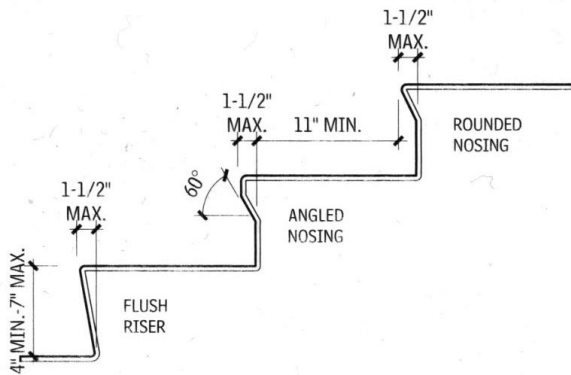


Stairs Typology

STAIR ELEMENTS 3.167



RISER DESIGN 3.168



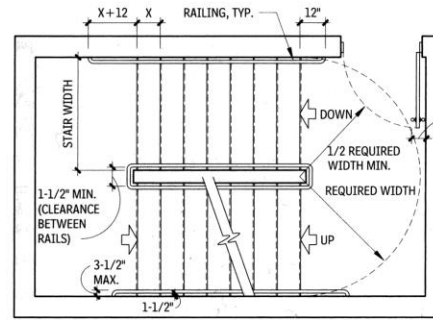
Nosings without abrupt edges that project no more than 1-1/2 in. beyond the edge of the riser are recommended. A safe stair uses a 1/2-in.-radius abrasive nosing that is firmly anchored to the tread, with no overhangs and a clearly visible edge.

STAIR CONSTRUCTION

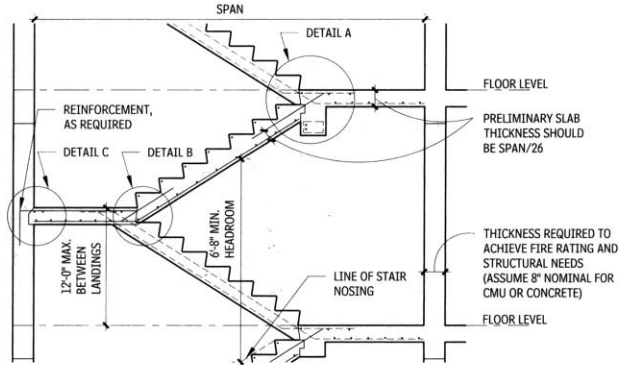
CONCRETE STAIRS

A common method of stair construction is the utilization of concrete, which can be cast-in-place or precast concrete.

I-TYPE CONCRETE STAIRS 3.170

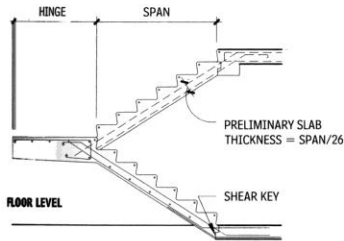


PLAN



SECTION

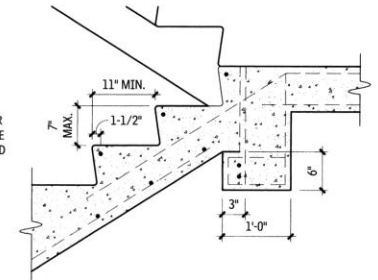
FREESTANDING CONCRETE STAIR 3.171



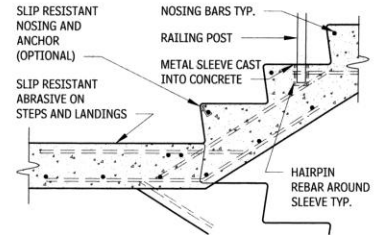
NOTES

- 3.170 a. Consult structural engineer for reinforcing steel placement.
- b. Verify required dimensions and clearances for code compliance.
- 3.171 Limit hinge dimension to requirements of stair.

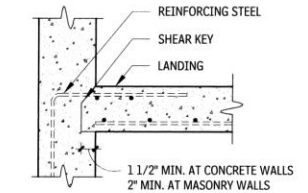
Contributors:
Krammehoek/McKeown and Associates, San Diego, California;
Karlberger and Companies, Columbus, Ohio.



DETAIL A



DETAIL B



DETAIL C

Stairs Typology

Stairway design is strictly regulated by the building code, especially when a stairway is an essential part of an emergency egress system. Because an accessible stairway should also serve as a means of egress during an emergency, the ADA accessibility requirements illustrated on the next page are similar to those of an emergency egress stairway.

Stairway Width

- The occupant load, which is based on the use group and the floor area served, determines the required width of an exit stairway. Consult the building code for details.
- 44" (1120) minimum width; 36" (915) minimum for stairways serving an occupant load of 49 or less.
- Handrails may project a maximum of 4-1/2" (115) into the required width; stringers and trim may project a maximum of 1-1/2" (38).

Landings

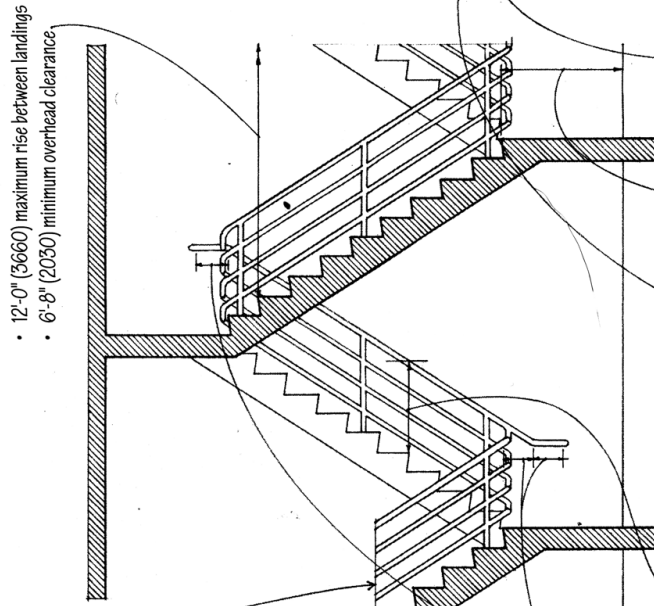
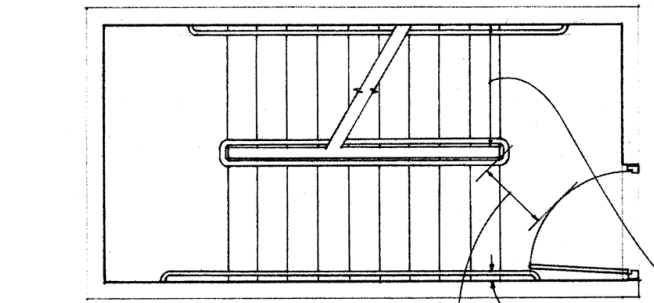
- Landings should be at least as wide as the stairway they serve and have a minimum length equal to the stair width, measured in the direction of travel. Landings serving straight-run stairs need not be longer than 48" (1220).
- Door should swing in the direction of egress. Door swing must not reduce the landing to less than one half of its required width.
- When fully open, the door must not intrude into required width by more than 7" (180).

Handrails

- Handrails are required on both sides of the stair. The building code allows exceptions for stairs in individual dwelling units.
- 34" to 38" (865 to 965) height above the leading edge of the stair treads or nosings.
- Handrails should be continuous without interruption by a newel post or other obstruction.
- Handrails should extend at least 12" (305) beyond the top riser and at least 12" (305) plus one tread width beyond the bottom riser. The ends should return smoothly to a wall or walking surface, or continue to the handrail of an adjacent stair flight.
- See the next page for detailed handrail requirements.

Treads, Risers, and Nosings

- A minimum of three risers per flight is recommended to prevent tripping and may be required by the building code.
- See the next page for detailed tread, riser, and nosing requirements.
- See 9.03 for tread and riser proportions.



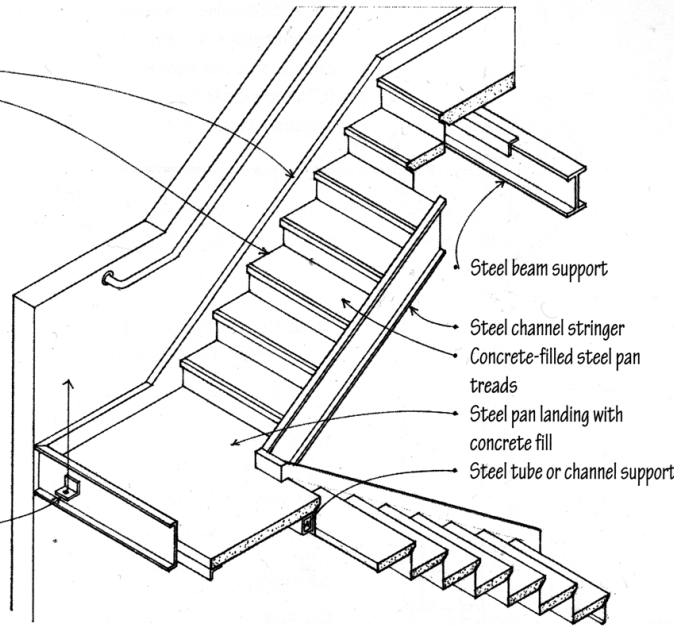
- ### Guardrails
- Guardrails are required to protect the open or glazed sides of stairways, ramps, porches, and unenclosed floor and roof openings.
 - Guardrails should be at least 42" (1070) high; guardrails in dwellings may be 36" (915) high.
 - Guardrails protecting the open or glazed side of a stairway may have the same height as the stair handrails.
 - A 4" (100) sphere must not be able to pass through any opening in the railing from the floor up to 34" (865); from 34" to 42" (865 to 1070), the pattern may allow a sphere up to 8" in diameter to pass.
 - Guardrails should be able to withstand a concentrated load applied nonconcurrently to their top rails in both vertical and horizontal directions. Consult the building code for detailed requirements.

Stairs Typology

Steel stairs are analogous in form to wood stairs.

- Steel channel sections serve as carriages and stringers.
- Stair treads span the distance between the stringers.
- Treads may consist of concrete-filled steel pans, bar grating, or flat plates with a textured top surface.
- Pre-engineered and prefabricated steel stairs are available.

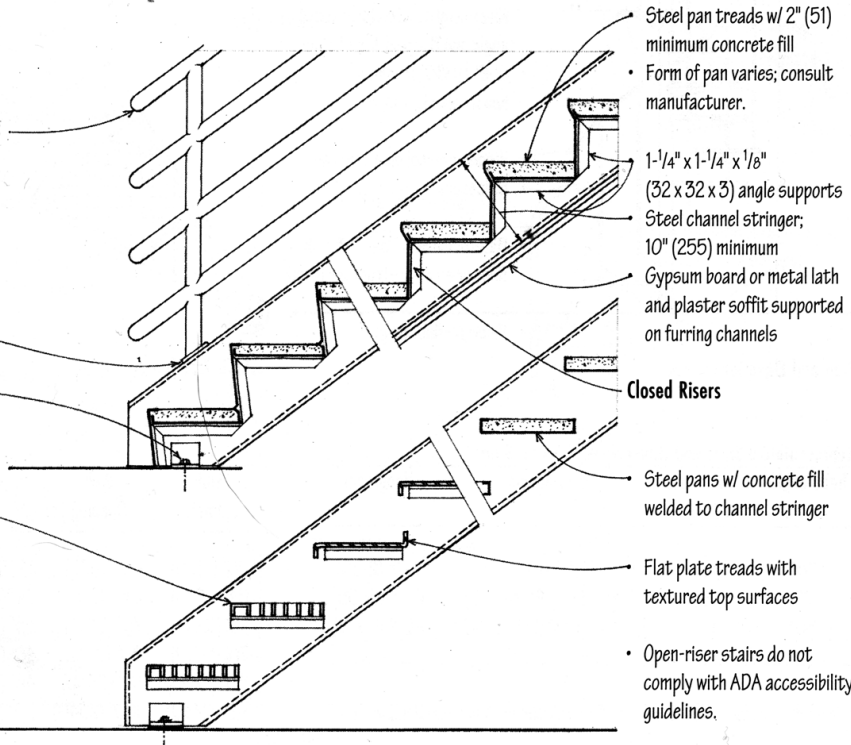
- Steel channel may rest on a bearing plate on masonry, or be hung on threaded rods from the floor structure above.



- Shop-fabricated handrail of metal pipe; 1-1/4" (32) Ø
- See 9.04–9.05 for building code requirements and ADA accessibility guidelines for handrails and guardrails.

- Field weld
- Clip angle w/anchor bolts secures each stringer to the floor structure.

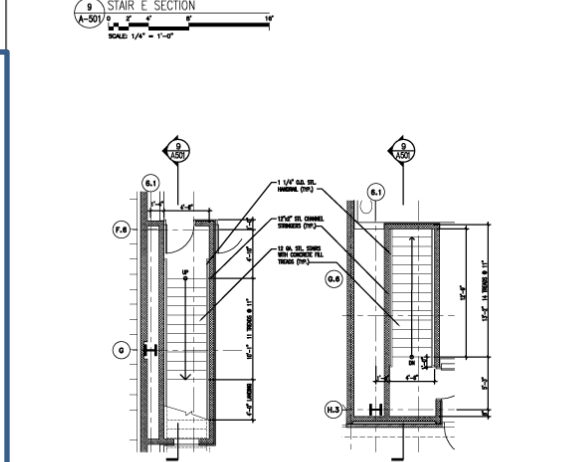
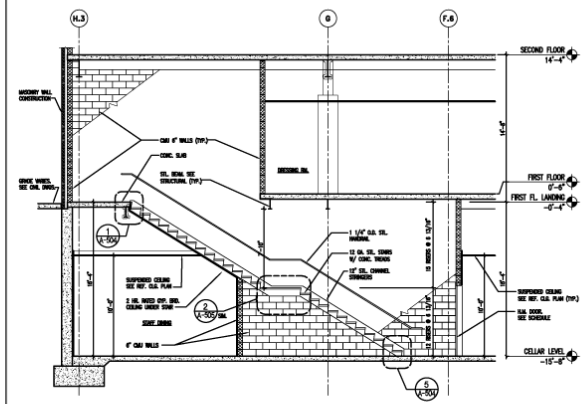
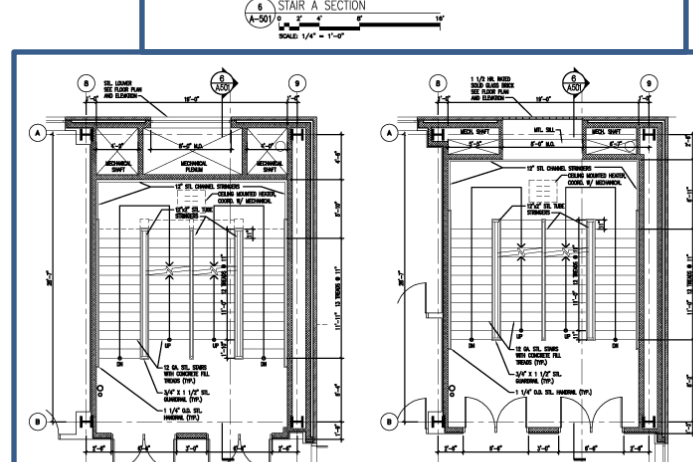
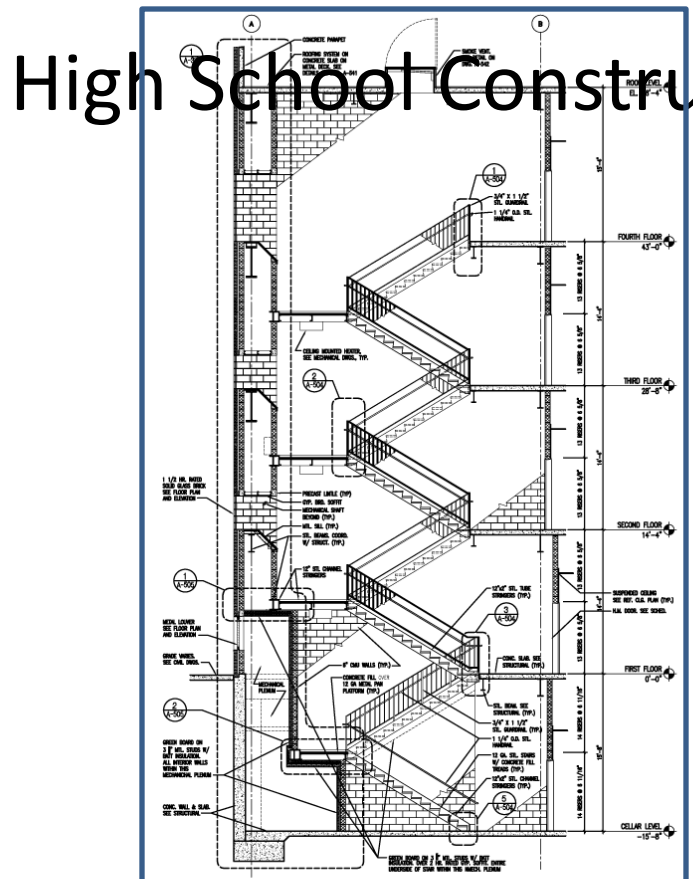
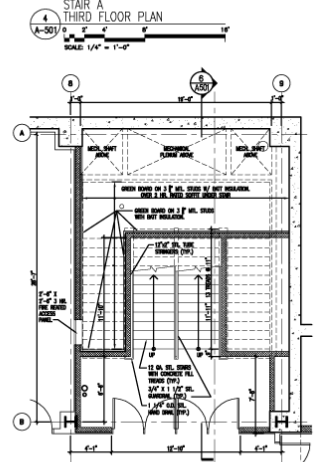
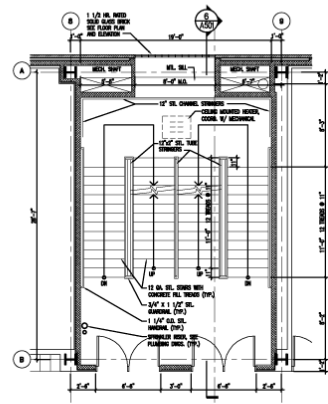
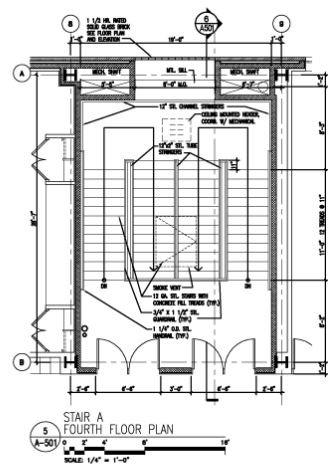
- Bar grating treads
- Nosing may consist of a checkered plate, closely spaced bars, or an angle with an abrasive strip.
- Wood and precast concrete treads are also available.



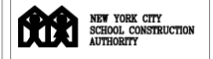
Open Risers

- Open-riser stairs do not comply with ADA accessibility guidelines.

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12-03-2003 Issued For Bid
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94th Avenue
95th Avenue
103rd Street
104th Street

BLACK 1061 LOT 41

KEY PLAN

Project Manager: J. Hahn
Design Manager: A. Harnett
Project Architect/Engineer: ARQUITECTONICA
Inspector: J. Hahn
Drawn by: J. Hahn
Checked by: J. Hahn
Date: 12-03-2003

Design No.: LLW #22714 Date: 12-03-2003

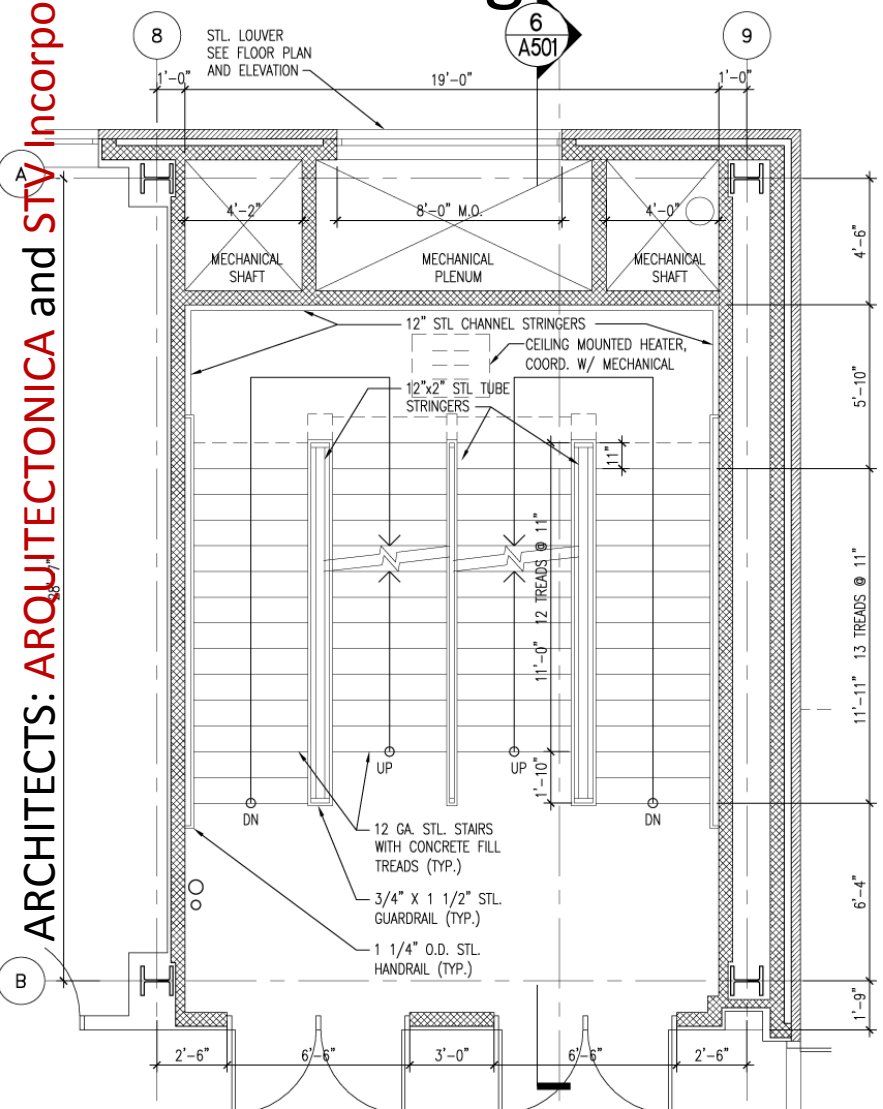
Project: HIGH SCHOOL OF ARCHITECTURE AND URBAN PLANNING
Address: QUEENS, NEW YORK

Drawing Title: STAIRS "A" AND "E" PLANS AND SECTIONS

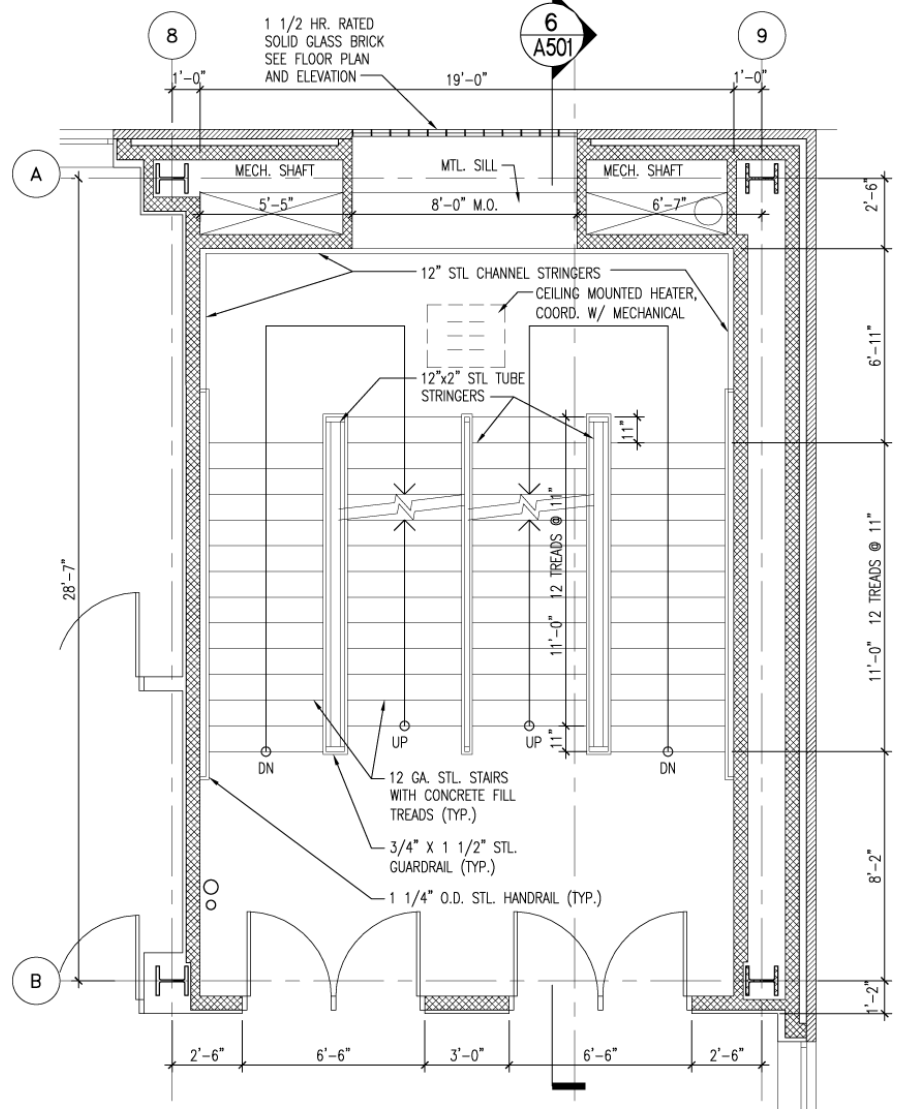
Drawing No.: A-501

Scale: 1/4" = 1'-0"

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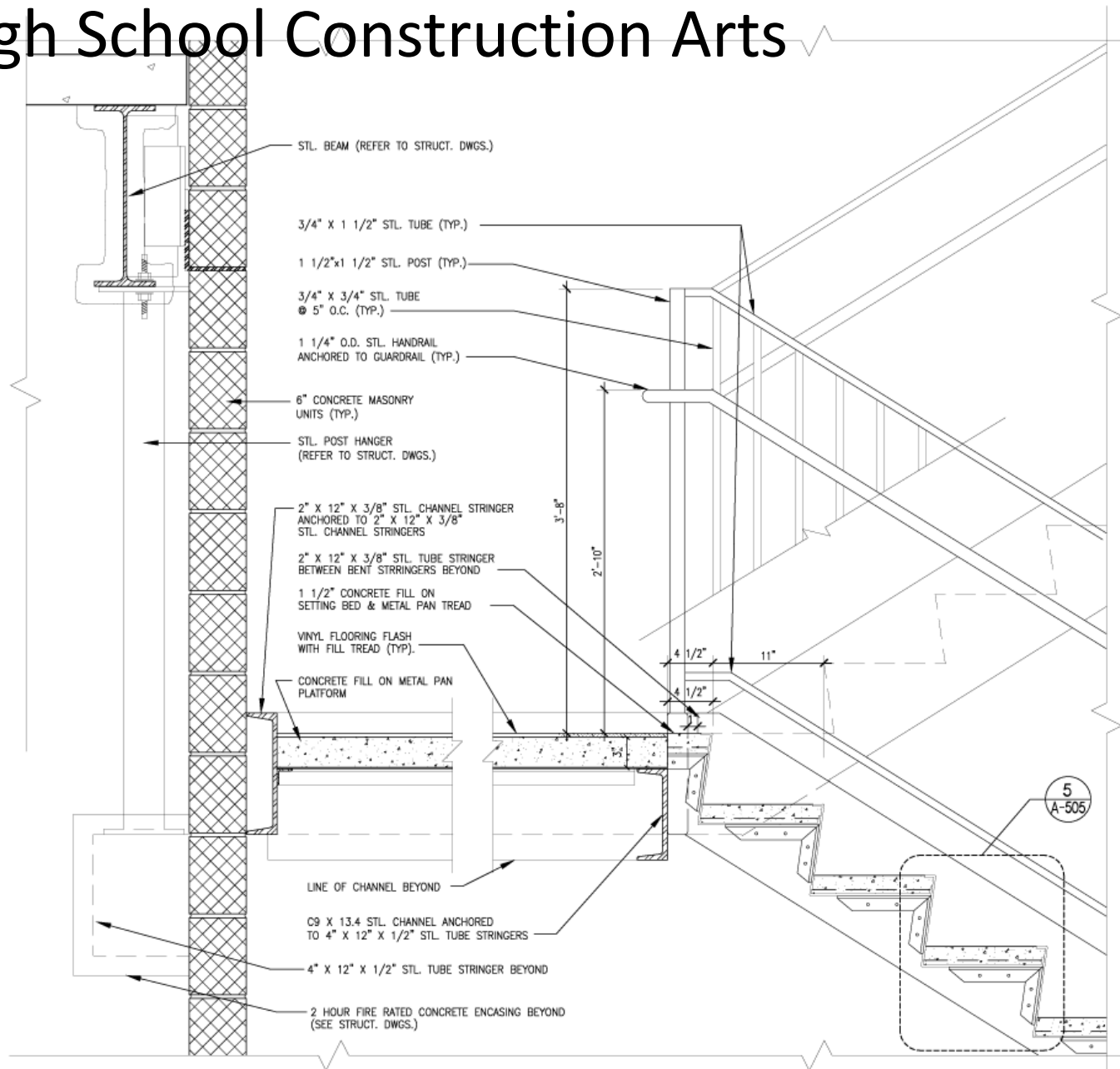
STAIR A
FIRST FLOOR PLAN



STAIR A
SECOND FLOOR PLAN



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5
A-505

Stair ADA and code issues

The minimum width of stair landings and platforms perpendicular to the direction of egress shall be equal to at least the width of the stair.

The maximum vertical rise of a single flight of stairs shall not exceed:

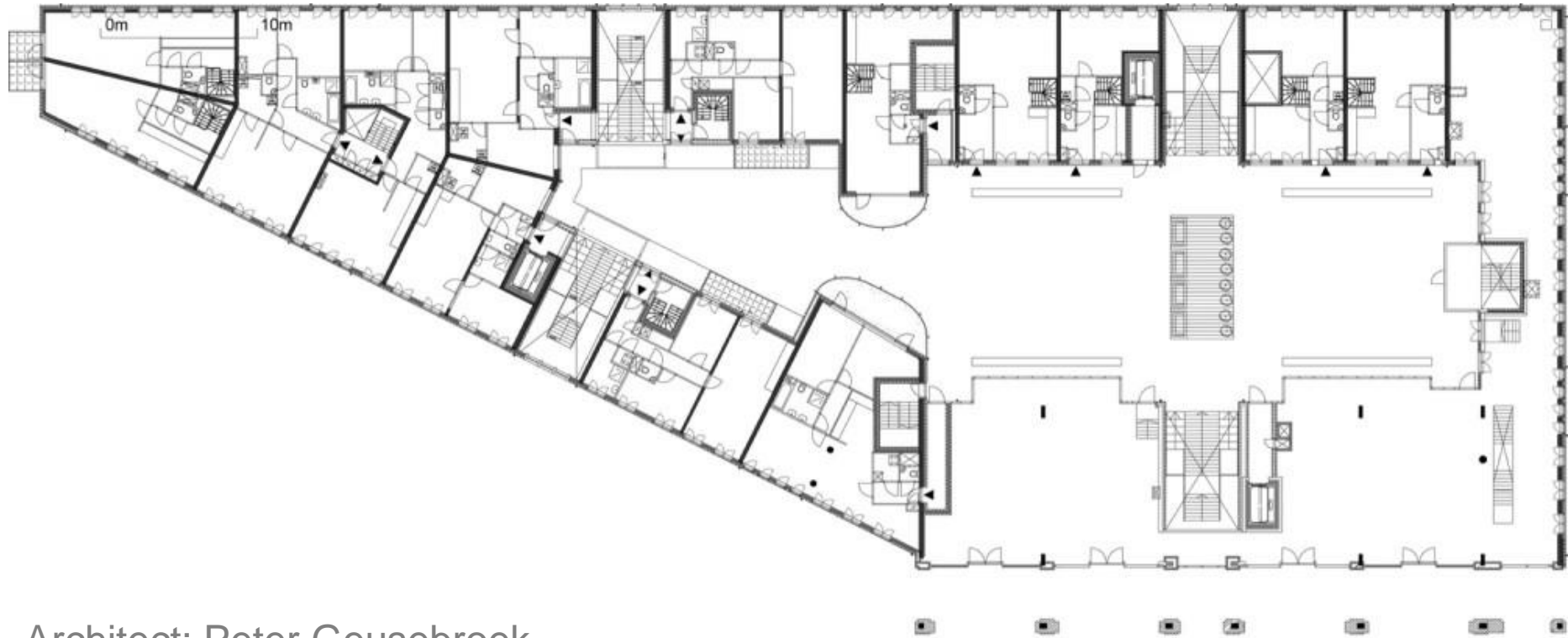
- 8' in Occupancy Group F (Place of Assembly) and H (Hospital, Nursing Home, Mental Institution, Jail)
- 12' in all other Occupancy Groups.

The swing of stair doors shall not block stairs or stair landings.

The swing of a Stair Door shall not reduce the clear width of the Stair landing to be less than seventy-five percent of the required width of the landing or stair.

The swing of a Stair Door shall not reduce the clear width of the Stair landing to be less than the width of the door opening on them.

<http://codes.lp.findlaw.com/nycode/ADC/27/1/6/5/27-375>



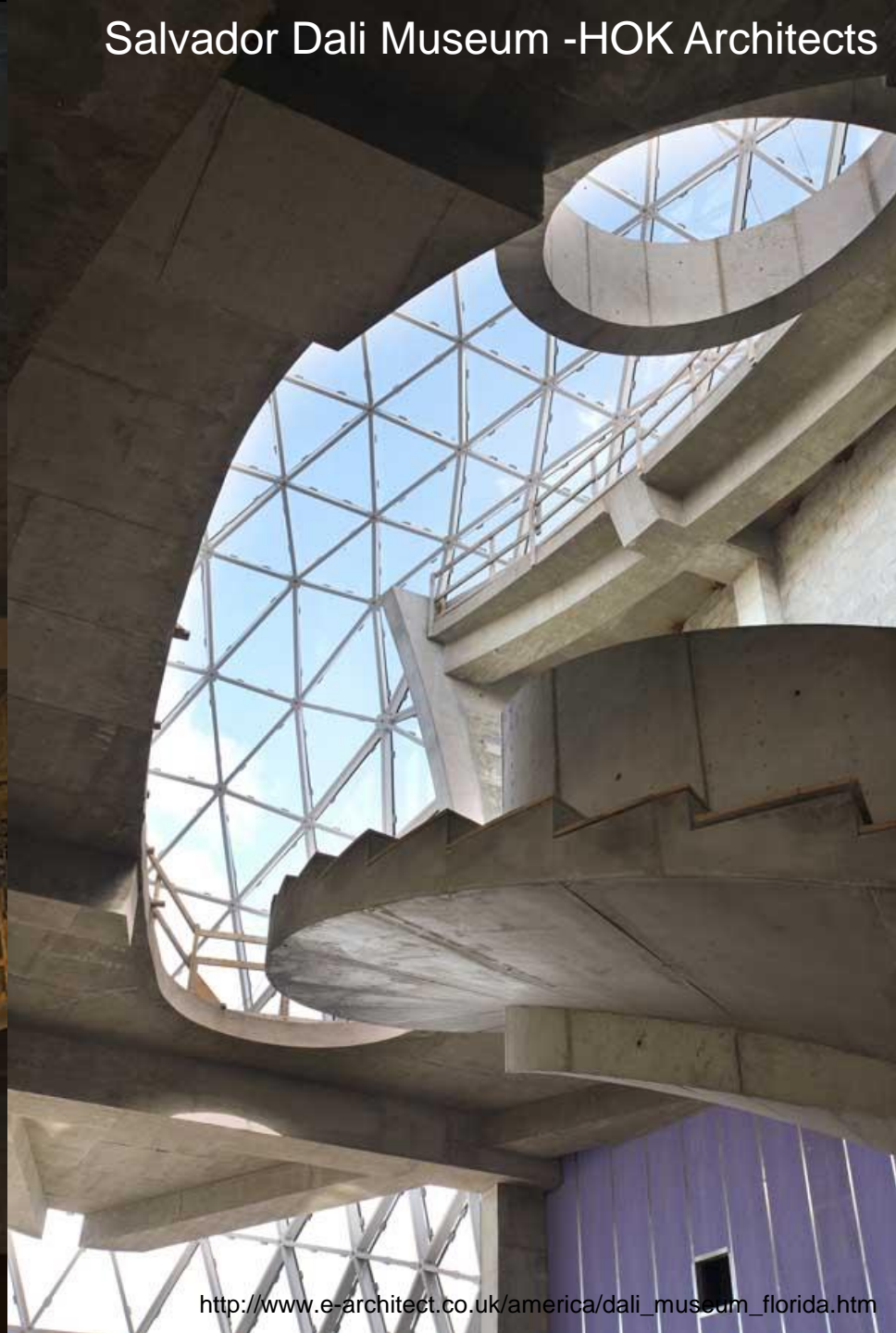
Architect: Peter Geusebroek
Location: Amsterdam, The Netherlands

<http://www.archdaily.com> © Thomas Mayer

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Architect: Peter Geusebroek
Location: Amsterdam, The Netherlands





Laurentian Library, Michelangelo, 1524

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