Girder-Slab®

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Structural System Matrix

Superstructure system comparison · CS3 v2 · 2026

	Girder-Slab® 8" hollow core precast plank + D-Beam® steel girder	**Filigree Flat Plate** 9" voided NWC flat-plate with stay-in-place formwork	**Conventional Flat Slab** 10" NWC 2-way flat slab	**Post-Tensioned** 8" NWC 2-way post-tensioned flat-plate
DESIGN CONSIDERATIONS				
Structural Cost / SF	**Medium**	High	High	High
Topping / Leveling	Floor leveling only	None	None	None
Shoring	**None**	Yes	Yes	Yes
Lateral System	Steel braced frames at stairs and elevators; select demising walls	Concrete shear walls at stairs and elevators	Concrete shear walls at stairs and elevators	Concrete shear walls at stairs and elevators
Demising Walls	All non-load bearing	All non-load bearing	All non-load bearing	All non-load bearing
System Self-Weight	**60 psf**	94 psf	113 psf	88 psf
Total Load (SW + ADL + LL)	**120 psf**	149 psf	168 psf	143 psf
Balcony Construction	Non-hollow core plank with thermal break	Same but no voids	Same	Same
Fire Rating	2 hr+ (UL K912). Bottom flange requires SFRM or gypsum soffit.	2 hr+. No additional fireproofing.	2 hr+. No additional fireproofing.	2 hr+. No additional fireproofing.
Sustainability / Embodied Carbon	**Medium** — structural steel, 93%+ recycled	Low	Low	Low
Rooftop Amenity & Screenwalls	Medium — post up from steel columns	**High** — design slab for transfer	**High** — design slab for transfer	**High** — design slab for transfer
Transfer Podium	Columns unable to stack require individual transfer girders	Columns unable to stack require individual transfer girders	Columns unable to stack require individual transfer girders	Columns unable to stack require individual transfer girders
PROCUREMENT CONSIDERATIONS				
Availability of Structural Materials	**High** — standard competitive bidding	Medium — manufacturer dependency; supply-chain risk	**High**	**High**
Formwork	**N/A**	Yes	Yes	Yes
CONSTRUCTABILITY				
Pre-fab Elements	Steel framing and slab. Plank arrives at full cured strength.	Stay-in-place formwork only. 28-day cure required.	None. 28-day cure required.	None. 28-day cure required.
Speed of Erection	**Fast.** Steel erection proceeds above planked floors.	Slow. Shoring over 3–4 floors below poured floor.	Slow. Shoring over 3–4 floors below poured floor.	Slow unless multiple pours per floor to rotate crews. Shoring over 3–4 floors.
Weather Sensitivity	**None**	High — added heating & hoarding in cold environments	High — added heating & hoarding in cold environments	High — added heating & hoarding in cold environments
Labor Needs	**Low** — single trade (ironworkers)	High — multi-trade sequencing	High — multi-trade sequencing	High — multi-trade sequencing
Safety	**High**	Medium	Medium	Medium
MEP Coordination	Dedicated core zones; must miss prestressing strands and D-Beam® grout zone	Dedicated core zones	Dedicated core zones	Dedicated core zones; must miss PT strands
Plumbing Chases	Keep away from D-Beam® and grout zone	More flexibility; keep away from columns	More flexibility; keep away from columns	More flexibility; keep away from columns
AESTHETICS & PERFORMANCE				
Flexibility for Future Modifications	Medium — column-framed layout	**High** — no beams	**High** — no beams	Medium — PT restricts penetrations unless core zones planned in advance
STC Rating (approx.)	55+ without carpet & pad	55+ without carpet & pad	55+ without carpet & pad	55+ without carpet & pad
Finish — Top Surface	Floor leveling compound	Trowel finish	Trowel finish	Trowel finish
Finish — Bottom Surface	Exposed concrete with taped joints	Exposed concrete with taped joints	Exposed concrete with skim coat	Exposed concrete with skim coat

Data sourced from CS3 project records across 400+ completed buildings. Loads based on standard residential assumptions (40 psf live + 20 psf superimposed dead). Values are representative — project-specific conditions may vary. All structural design must be performed by a licensed engineer of record.

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