

Concrete Contractor's Perspective: Challenges, Progress & Wins

Mike Hernandez, PE, FACI, Technical Director
America Society of Concrete Contractors

What is ASCC? Concrete Contractor Trade Assoc.

Self Performing GC's



Concrete Contractors

THE TOP 20 FIRMS IN CONCRETE ENR 2024

RANK 2024	RANK 2023	FIRM	ASCC	(\$ MIL.) 2023 REV.	% CHANGE '22-'23
1	1	BAKER CONSTRUCTION ENTERPRISES INC.	ASCC	2,300.0	+7
2	2	LITHKO CONTRACTING	ASCC	1,740.7	+8
3	5	SUNTEC CONCRETE INC.	ASCC	909.0	+23
4	3	STRUCTURAL GROUP	ASCC	825.0	+3
5	6	KENT COS. INC.	ASCC	824.6	+25
6	4	LARGO CONCRETE INC.	ASCC	724.6	-2
7	7	CONCRETE STRATEGIES	ASCC	524.2	+4
8	8	KEYSTONE CONCRETE	ASCC	511.5	+7
9	9	CECO CONSTRUCTION GROUP	ASCC	484.7	+4
10	17	PACIFIC STRUCTURES INC.	ASCC	322.3	+37
11	10	ORION CONCRETE	ASCC	315.9	-23
12	11	FESSLER & BOWMAN INC.	ASCC	313.6	+1
13	15	MARTIN CONCRETE CONSTRUCTION	ASCC	296.0	+15
14	**	PRECISION CONCRETE CONSTRUCTION INC.	ASCC	261.2	+83
15	13	CAPFORM INC.	ASCC	260.0	-13

**Hundreds more contractors
\$1 million - \$250 million/yr**

Associates



SUSTAINABLE | INNOVATIVE | VERSATILE
THAT'S CONCRETE MADE IN MARYLAND

What is ASCC? What do we offer?

- Contractor Hot Line (> 350 calls/year)
- Position Statements
- Safety & Risk Management Council
- Decorative & Polishing Councils
- Certification, ACI Flatwork & Polishing
- Committees:
 - Technical
 - Constructability
 - NRMCA/ASCC Paving
 - Sustainability & Others
 - Emerging Leaders
 - Finishing
 - Education & Training

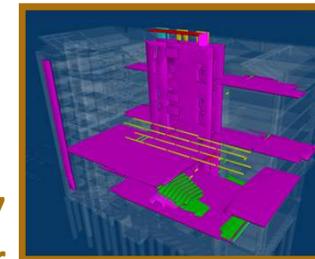
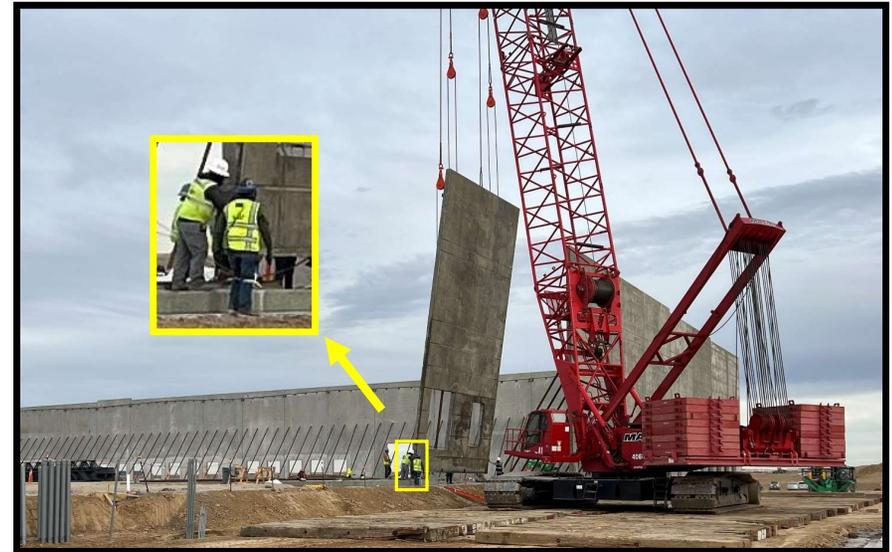


Who is Mike Hernandez?

Concrete Contractor or GC: 1996 – 2022, large buildings & bridges



Florida Formwork P.E. & BIM Manager



2015-2017

MAKE A 
**CONCRETE
DECISION.**

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MARCH 17-18, 2025

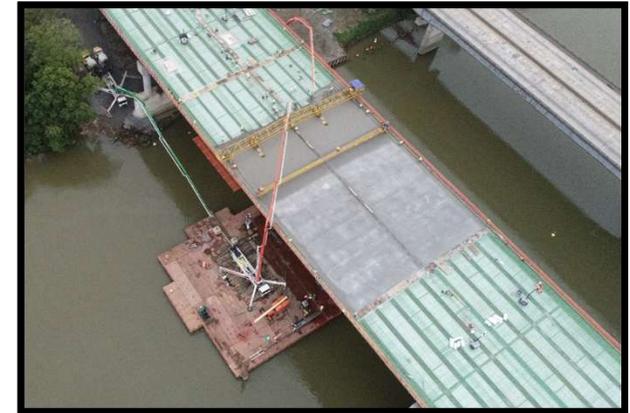
25th ANNUAL MARYLAND CONCRETE CONFERENCE

Who is Mike Hernandez?

Concrete Contractor or GC: '96 – 2022, large buildings & bridges



Site cast
FIB-72's



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Who is Mike Hernandez?

ASCC: Technical Director Jan 2023 – Present

- Co-Chair Finishing Committee
- Co-Chair Sustainability Committee
- Co-Chair Technical Committee
- Constructability Committee

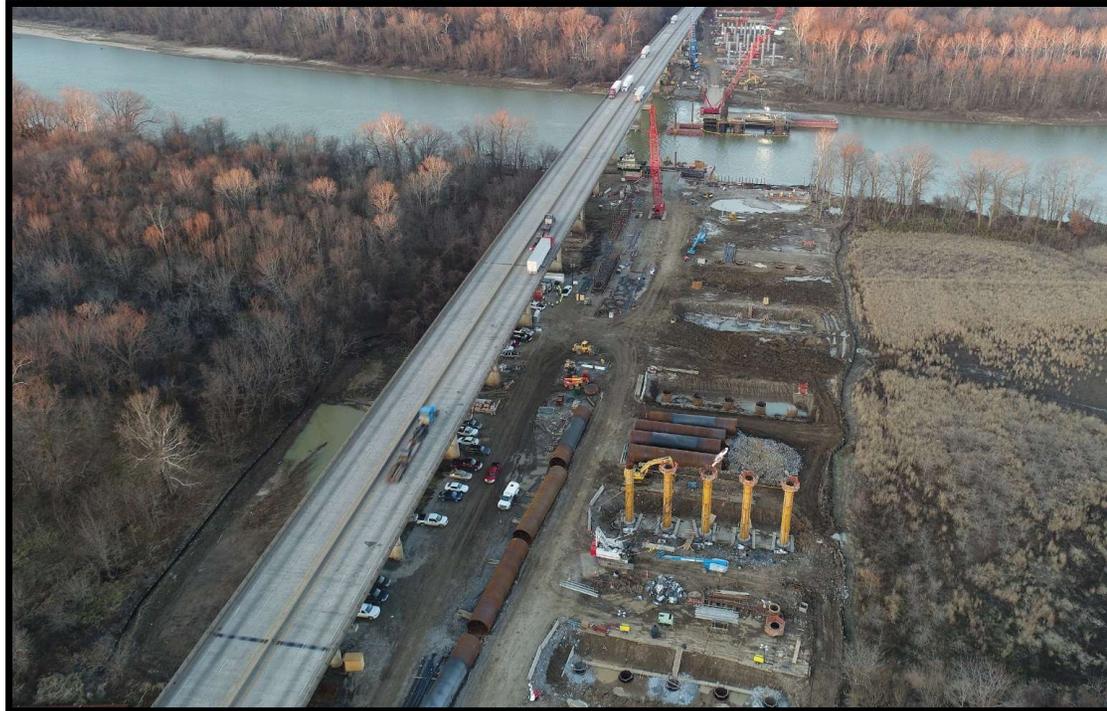


ACI: 2006 – Present , FACI

- Voting Member *former*
 - 117 Tolerances, Joint ACI-ASCC
 - **131 BIM, Chair '21-24**
 - 207 Mass Concrete
 - 301 Specification for Conc. Construct.
 - 302 Construction of Concrete Floors
 - 305 Hot Weather Concreting
 - 308 Curing
 - 310 Decorative Concrete, Joint ACI-ASCC
 - 90-07 TAC Productivity & Constructability
 - E703 Concrete Construction Practice, *Chair '09-16*
 - C640 Craftsman Certification
 - MCC 90 Alliance for Concrete Codes & Standards
 - ACI Chapter South Florida - *President, VP*



Safety Challenge: Right Safety Culture

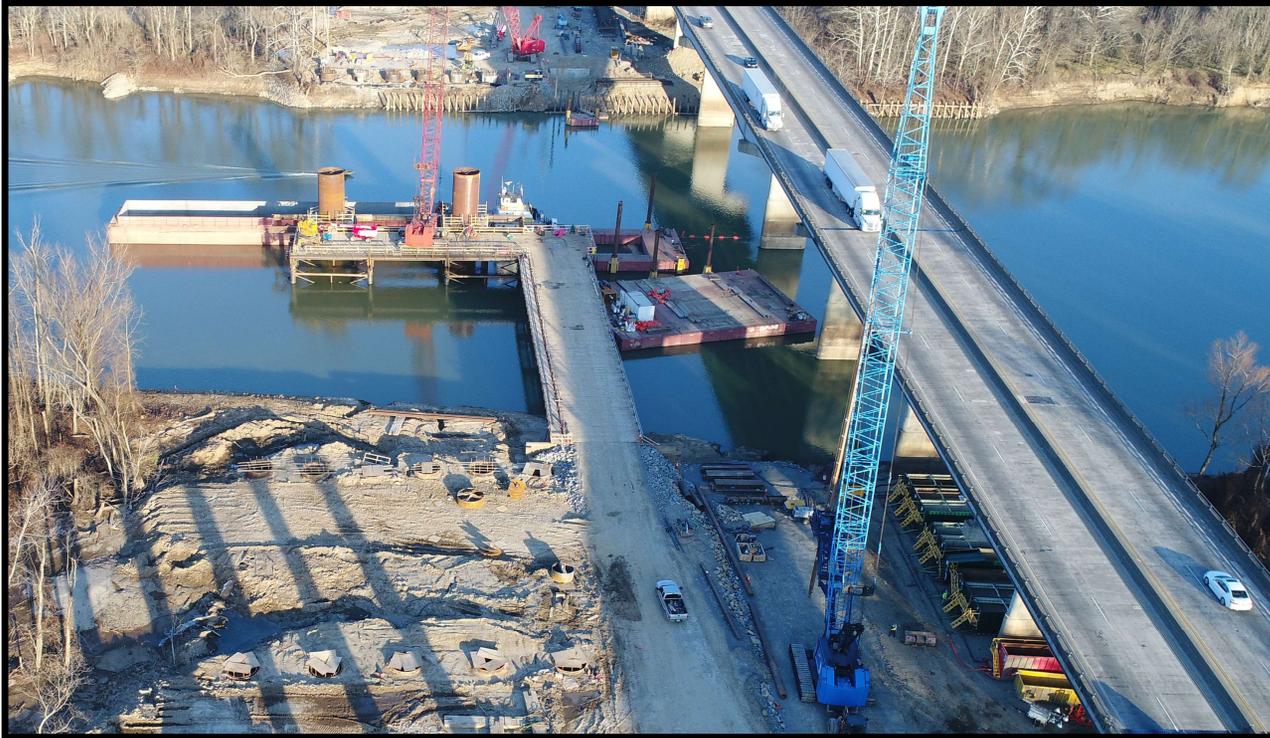


- ~\$100,000,000 project is months behind schedule
- **Deep foundation crew works 24/7 when hole open**

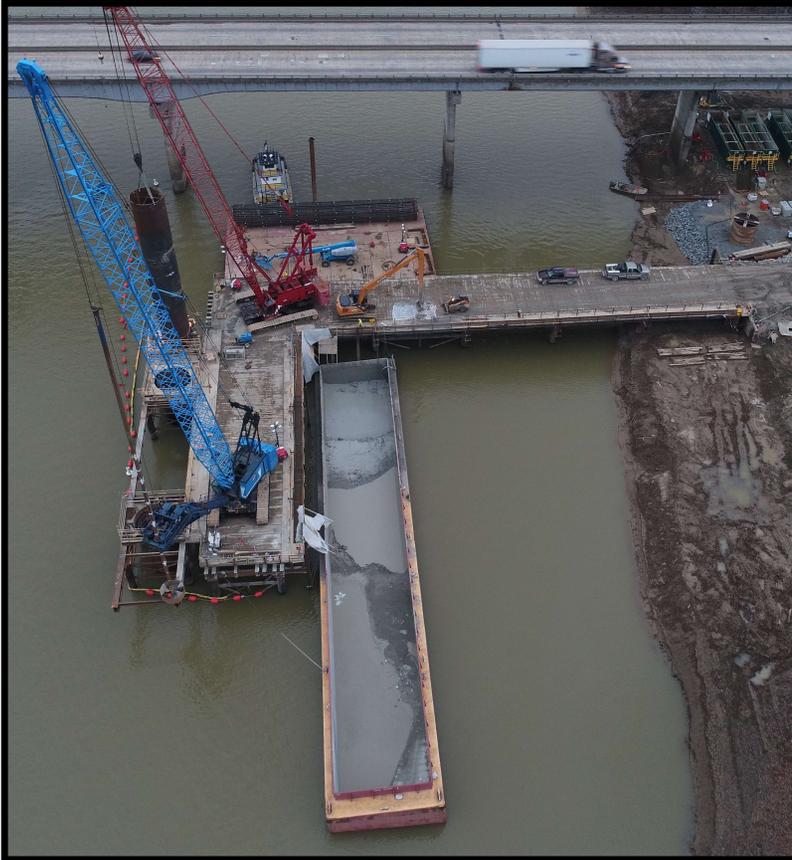
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Safety Challenge: New Location & Team

- Far shore (6) 12' diameter x ~150' deep drilled shafts complete
- Moving to trestle in river to drill/reinforce/place (6) 12' dia. x ~150' shafts



Safety Challenge: What is Emphasized Most?



Task Technical Difficulty: High

GC's Safety Culture: Improved yet fragile.
Lots of talk about \$chedule & Co\$t

Drilling Sub's Culture: Team pride in ability to build most challenging projects. New & young project leader proving himself worthy of *General Superintendent* title

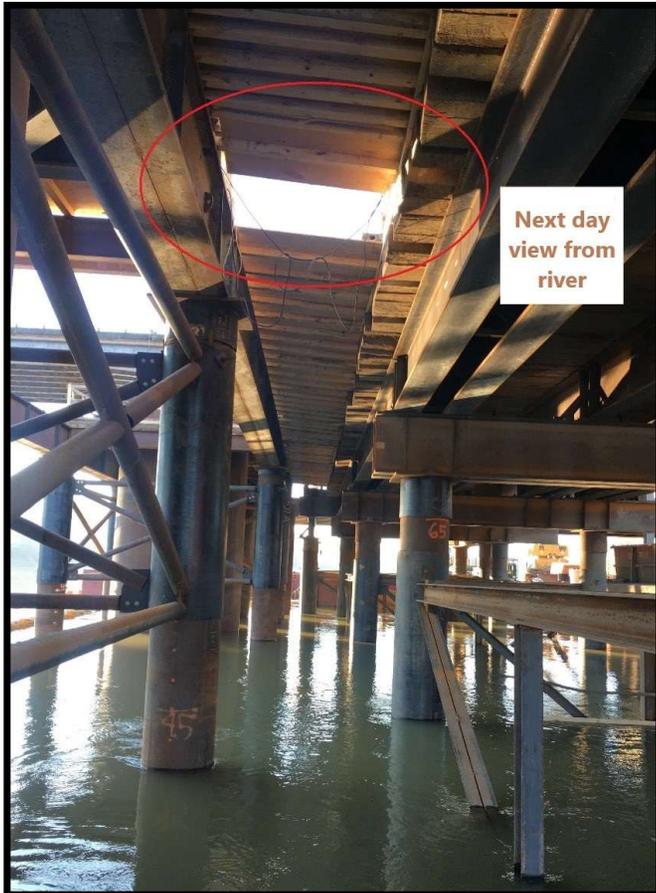
Operation's Risk Profile: Mitigated where it can be, **risk still medium to high**

Safety Challenge: Unspoken Rules?

- New Laborer joins night crew of ~ 7 men, 1 - 2 days off if finish tonight
- Needs more 2x4's, can go around >3 sides of crane using walkways OR take shortcut through & outside of handrails. Lifevest is handy.



Safety Challenge: Know Implied Priorities



- Worker steps through handrail to a spoils screen/plywood not designed as a walkway
- **Wood slips off support, worker falls to water**
- **Broken bones during fall, nearly drowns**
- Rescue hampered night conditions, safety buoys & turbidity screen in river

Progress & Wins: Safety Culture 1st in Ops

- New Employee with less than 2 weeks on site
- He recognized a hazard
- Culture that **\$chedule** “most important” controlled

Lesson: Team culture needs to say *“Watch each Other’s Back Core Value >> schedule & cost”*

Challenges? Quality, Schedule & Cost

#1 concern from contractors in ASCC survey:

Drawing Coordination: Struct-Arch-MEP-Tolerances

- Understand Design Teams' fee & schedule are squeezed
- Pressure to permit & start projects quickly
- Deferred Design Submittals by design team to trades common in struct. steel, M-E-P-FP, curtain wall, elevators...
- **“Field (Design) Coordination” by GC & trades too common**

Challenges? Quality, Schedule & Cost

- “Silver Tsunami”: Retirement of aging skilled leaders of design & construction teams who would *make it work* not being replaced fast enough
- Skilled Craft workforce shortage
- Can burn through fixed overhead & schedule waiting for RFI’s when find issues at face of work during construction

Progress & Wins? Use BIM (VDC)

When there is Ri\$k

- **On a Complex Project**
- **Drawings poorly coordinated or incomplete**
- High \$ value for your company, too big to underperform on
- Formwork challenges?
- Reinforcing complexity?

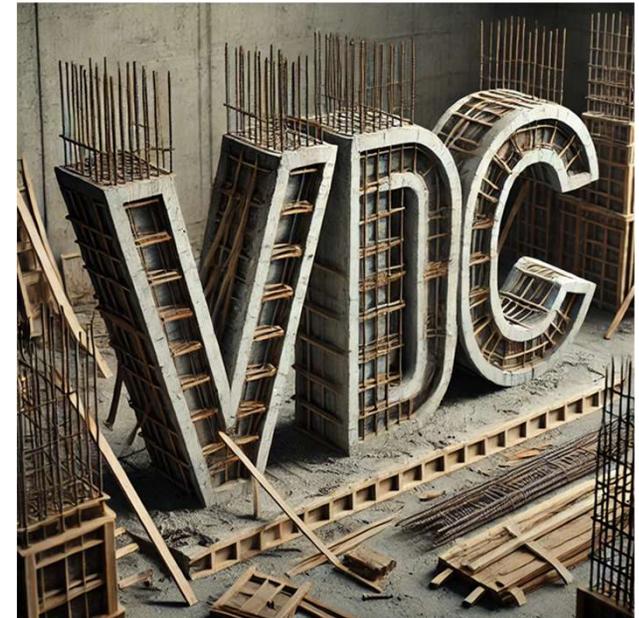


Image generated by AI Dall-E

Progress & Wins? Why use BIM (VDC)?

Best preplanning Tool

- **Goal: Build the project digitally to resolve issue ahead of construction operations**
- Safety: mitigate hazards & pre-plan exclusion zones
- Optimize schedule sequence (4D)
- “Force multiplier” to allow experienced staff to preplan the work for less experienced team. Possibly link model to the cost estimate (5D)

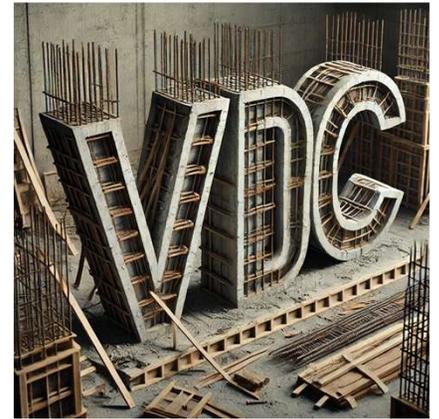
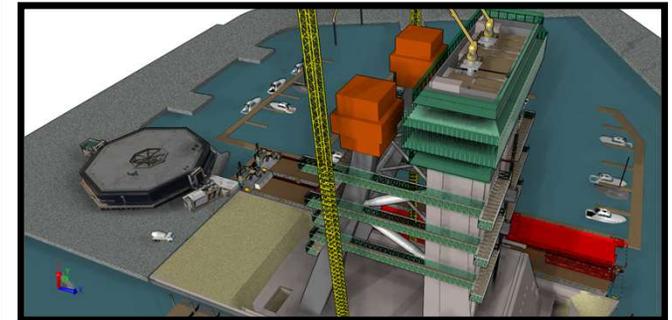
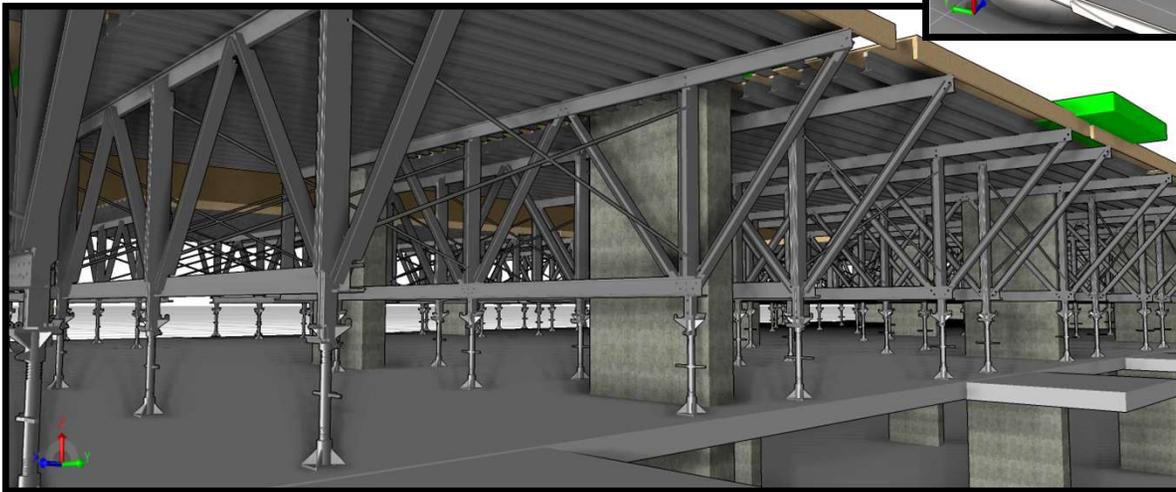
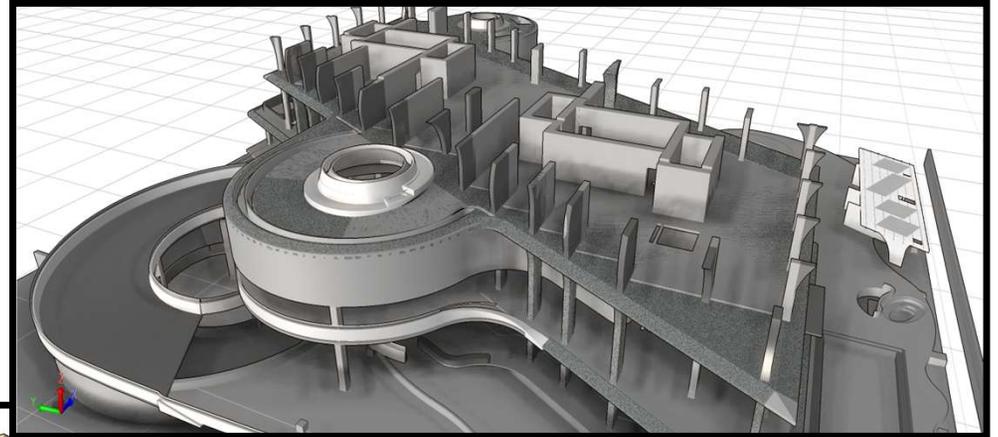


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Progress: VDC During Operations

Not “*Hollywood BIM*”

(highly rendered images only used to look cool at bid time never to be touched by the project builders)



Images courtesy of Baker Concrete

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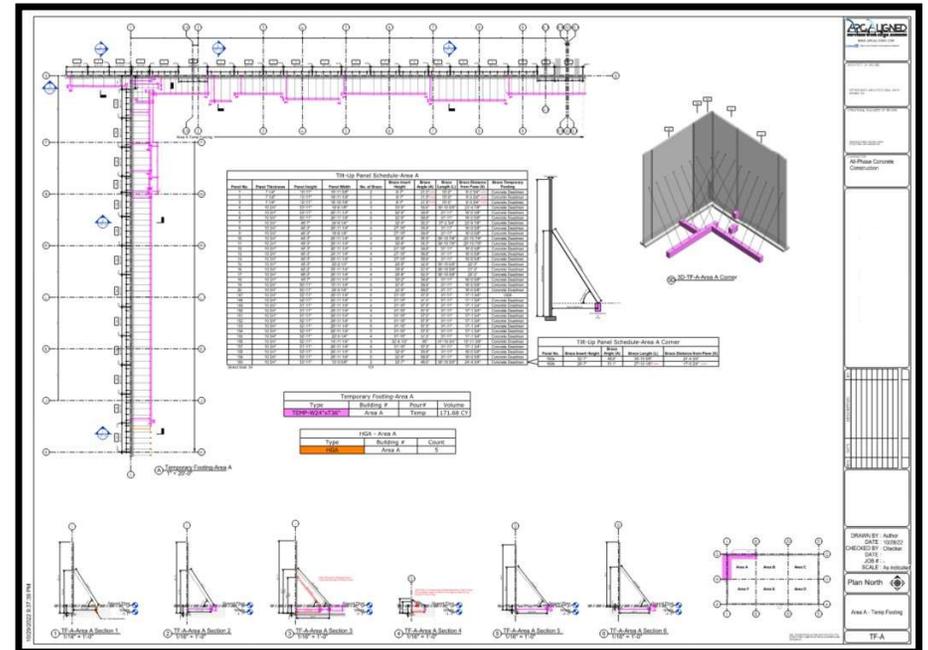
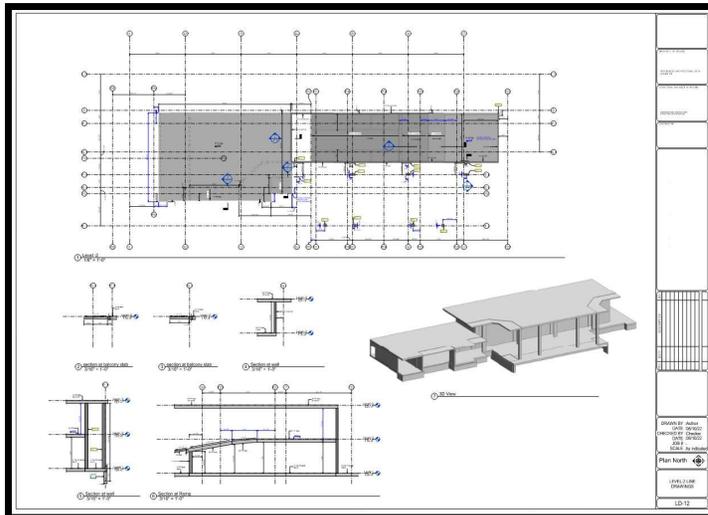
VDC in Ops: 1. The Concrete Model

- **Concrete line drawings / coordination**
- Site Layout points from created model
- Trade Coordination & clash detection
 - Site Logistics (bonus)
 - Change Order Support (bonus)
- **Concrete model needed for linking schedule, formwork models & reinforcing models**

VDC in Ops: 1. The Concrete Model

LINE DRAWINGS

- Combine structural, architectural & embed shops into 1 set
- Plans, sections, isometrics
- Single source of truth for carpentry crews



Images courtesy of All-Phase Concrete

VDC in Ops: 1. The Concrete Model



Image courtesy of Conco

Model based Site Layout

- Replace data point transfer from 2D CAD based process
- VDC techs maintaining the model, survey Party Chief pulls points with X, Y & Z attributes
 - Teams QC check each other

VDC in Ops: 1. The Concrete Model

Trade Coordination

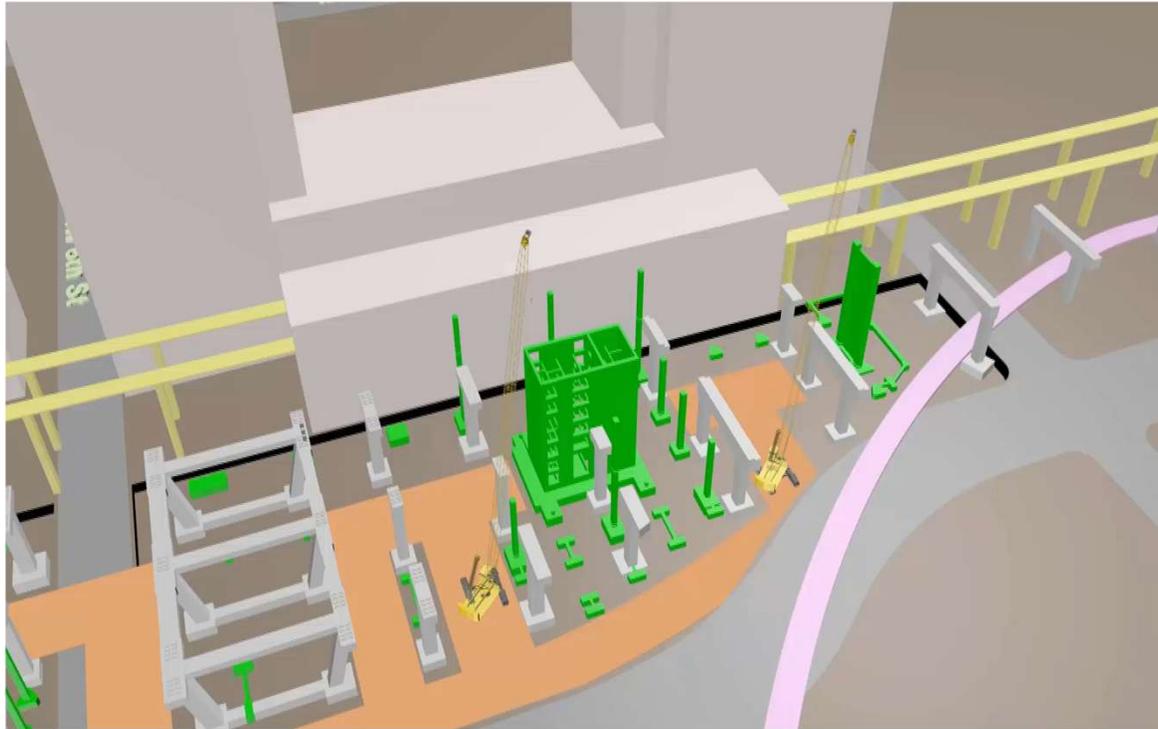
- Confirm where/how everything is going to fit in the building using clash detection
- Most of ENR top 50 have already fully embraced this technology in projects > \$100MM or complex
- M-E-P-FP coordination often has biggest benefit for the project



Image from Sundt Construction website

VDC in Ops: 2. 4D Master Schedule

Schedule savings estimates vary widely



- Visualize the sequence & discuss the durations
- Test several schedule options before committing to the final sequence

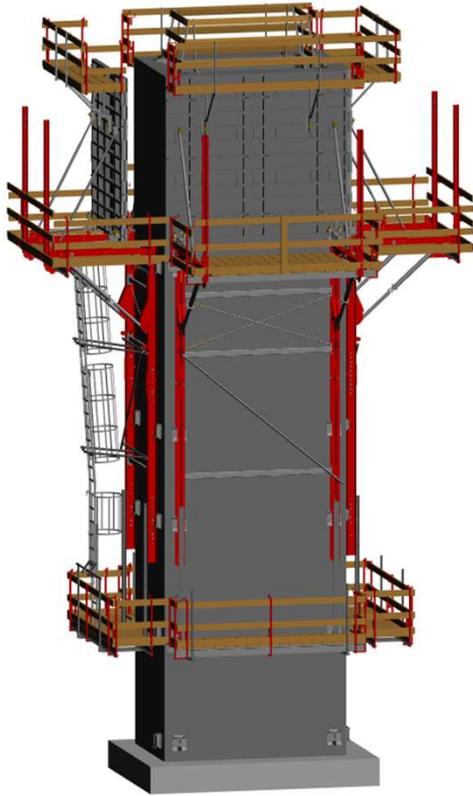


Images courtesy of Baker Concrete

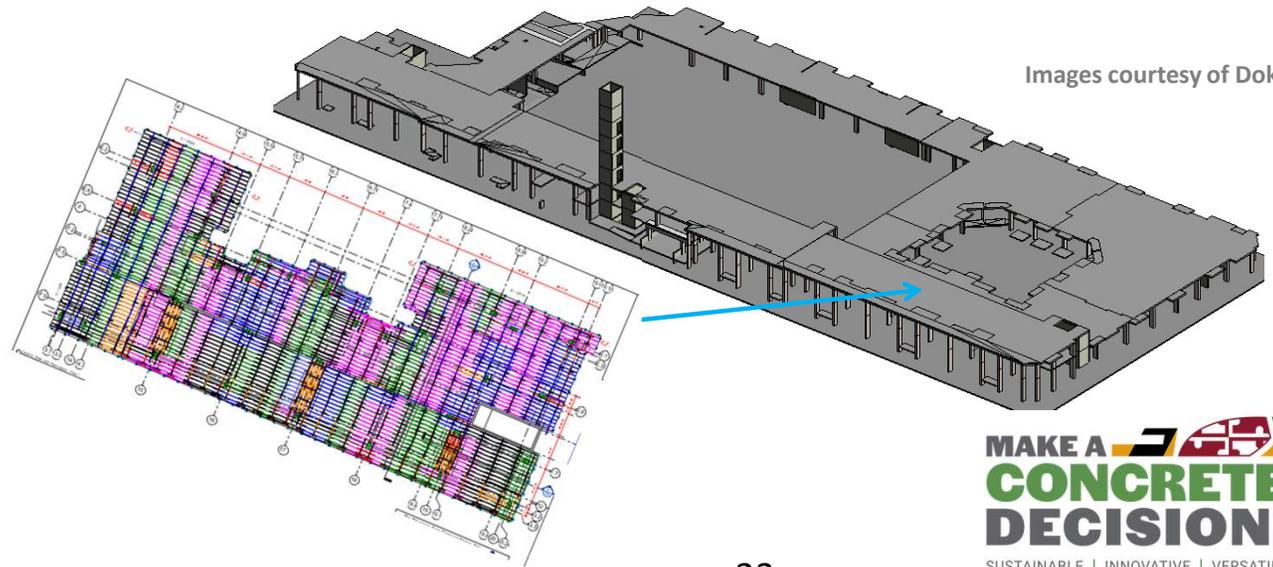
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VDC in Ops: 3. Formwork Model

- Need concrete model as the starting point
- Formwork model by vendor or in-house detailers
- Great accuracy in pieces & parts necessary in the field
- 2D & 3D drawing output



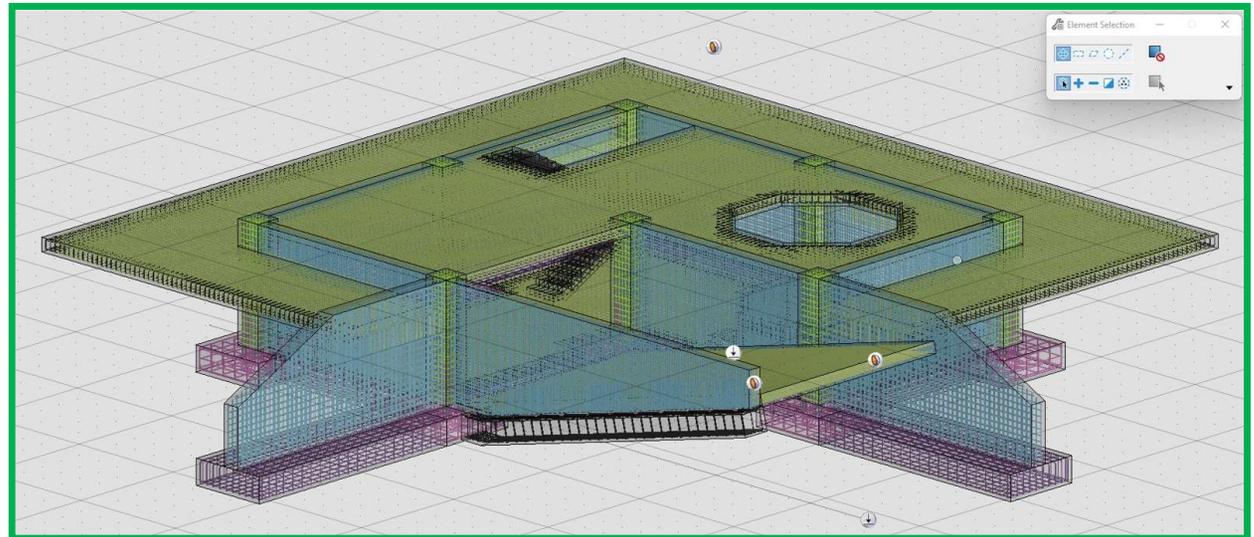
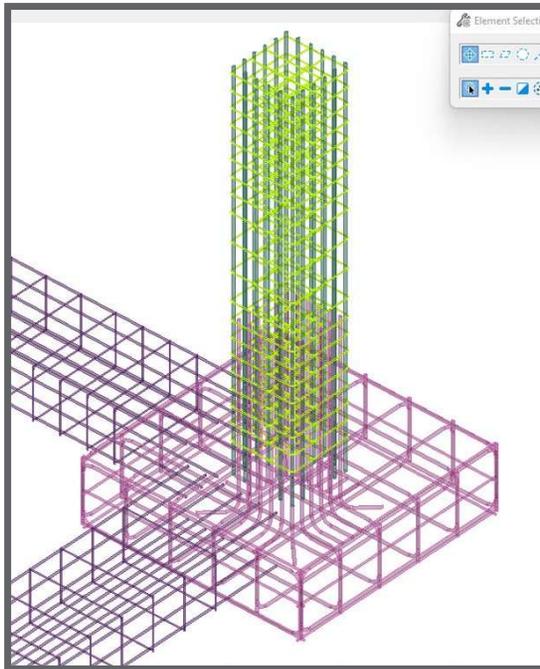
3D pdf courtesy of MEVA



Images courtesy of Doka

VDC in Ops: 4. Rebar Model

- <10% of the rebar detailers can use VDC per CRSI BIM committee
- **Per ton BIM premium depends on # of hours involved**
- **If not possible, strike rebar from BIM Implementation Plan LOD's**



Images courtesy of CRSI BIM Committee

VDC in Ops: 4. Rebar Model

Any given project can be detailed:

- 100% 2D (Most Projects)
- Hybrid 2D-3D (Some Projects)
- 100% 3D (Few Projects)

All still need 2D line drawings

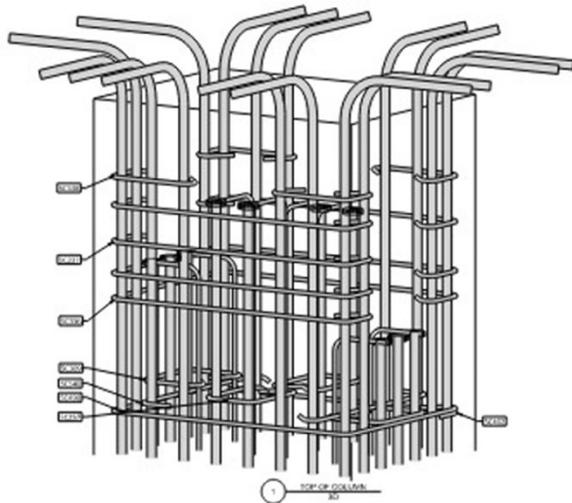


Image courtesy of Conco

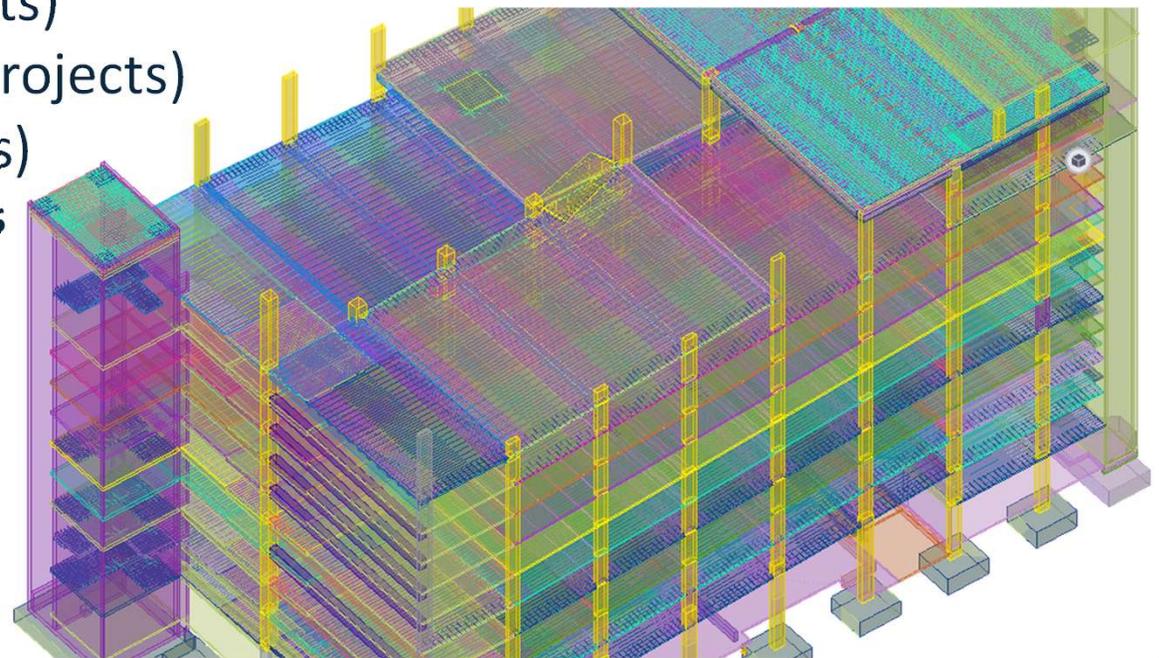


Image from Tekla website
The Fifth Parking Garage by BDS Steel Details

Contractor Win: Expected Work Flow

- Need 6 – 8+ placements to justify vertical gang forms
- **(3) pour horizontal or wedding cake sequence** is ideal in elevated decks



Image from Miami Condo Investments website



- **Vertical stacking = fewer options**, high rise deck cycle:
 - place ½ every Tuesday (or Monday)
 - other ½ every Friday (or Thursday)

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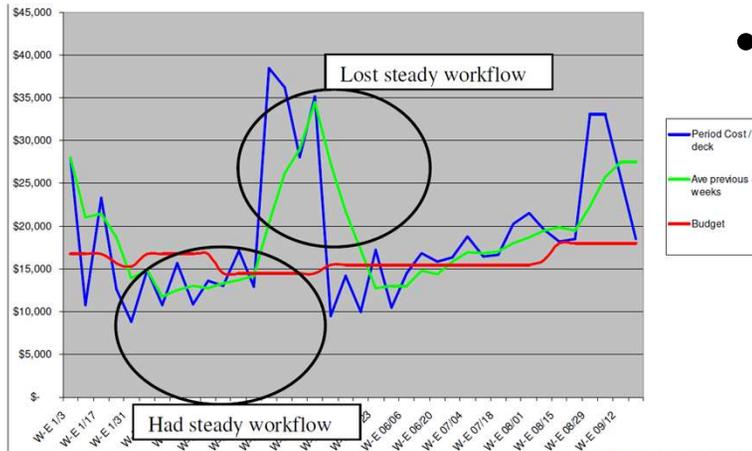
Contractor Win: Expected Work Flow

1. Pier Cap placed
2. Set Beams
3. Overhang brackets & SIP
4. Reinforcing Slab
5. Placed Deck & Wet Curing
6. Plinth Forming



Bad Month: Disrupted Work Flow

- Lose productivity fast if **flow stops** & crews bunched up



- I underestimated complexity & schedule duration of **cantilevered post tensioned substructure**

(Happens if you don't know what you don't know)



Contractor Win: Happy Customer

- Everyone loves when a plan comes together
- **Happy Customers are Repeat Clients & Fans**

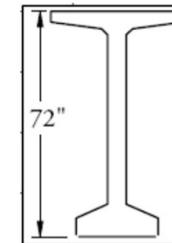
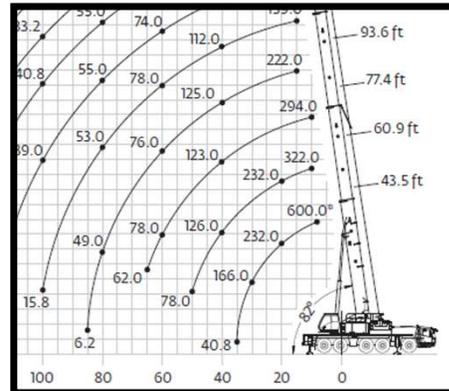
ASCC Win: Happy Stakeholders

Collaboration of PCA (+ Members) & NRMCA (+ Members)
& ASCC (+ Members) = **Better Concrete Outcomes**



Learning Activity: “Pass Through Dance”

- All Terrain (AT) Truck Cranes 250T & 300T in Tandem Lift
 - Overnight MOT: Need up & down without damage to roadway
 - Want minimum radius for max capacity during critical lifts
 - Once on outriggers, crane can't move
 - Critical lift planners stuck



120' typical Bulb-T 72
 ~110,000 lbs each
 with dapped ends

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Learning Activity: “Pass Through Dance”

- **Operators know better than the P.E.s – “*Pass Through*”**
 - **Lift off trailer**
 - **Both swing left**
 - **Beam passes in front of right**
 - **Left swing right, Right swing left facing back**
 - **Beam passes in front of left**
 - **Both swing right facing back**
 - **Square up on piers & set**
 - **Repeat 3x**
 - **Jump one crane to next span**
 - **Repeat 3x & go home**

Last Thought: Invest in Your People

When people know their manager wants the best for them, they give discretionary effort. Some need to hard/technical skills in concrete or safety. Others to develop soft skills for more effective leadership or comfort making presentations.

Hard Skills in Safety & Concrete options:

- **ATTSA** roadway certification & safety programs <https://www.atssa.com>
- **Board of Safety Certified Professionals (BCSP)**, Safety Trained Supervisor & other <https://www.bcsp.org/>
- **ACI** has multiple webinars & certifications: Field Testing Tech, Flatwork Finisher, Concrete Construction Inspector, Reinforcing Bar Inspection... <https://www.concrete.org/certification/certificationprograms.aspx>
- **Post-Tensioning Institute (PTI)** has design seminars, webinars & certification <https://www.post-tensioning.org/education.aspx>

Last Thought: Invest in Your People

Soft Skills in Construction options:

- **National Center for Construction Education and Research (NCCER):** Among their programs are classes for Crew Leadership, Construction Superintendents, and Certified Instructor. Some programs require in-person training, others can be 100% online. <https://www.nccer.org/>
- **Dale Carnegie** speaking & presentations: few things make people more nervous than looking foolish in front of a large group of peers or strangers. The program will help staff to become comfortable, even confident public speakers. <https://www.dalecarnegie.com/en>
- **Construction Industry Institute (CII)** offers various education programs such as Construction Mgmt. Essentials virtual or in person at the University of Texas. <https://www.construction-institute.org>

Questions?

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