

# **MGI** McFarquhar Group Inc

## **New Parkland Hospital: Glazing Meets Structure Dallas TX**

BEST 5 Conference  
Philadelphia, NV

17 April 2018

Presenter:

Dudley McFarquhar, Ph.D., PE (Dr. D)  
CEO, President, McFarquhar Group Inc  
108 Willowbrook Dr  
Waxahachie TX 75165

## New Parkland Hospital, Dallas TX



New Parkland Hospital, Dallas  
Texas

**BACKGROUND**

- Began in Nov 2010
  - Construction Partners selected in 2009
- **Largest Hospital in the USA**
- High Expectations
- Thorough Design Process
- Unique Design Elements
- High level of co-ordination
- Made an immediate impact
- Will be Completed in 2014

# New Parkland Hospital, Dallas Texas

## KEY TEAM PLAYERS

- Owner: Parkland Hospital, Dallas TX
- GC – BARA, Dallas TX
  - Balfour Beatty Construction
  - Austin Commercial
  - HJ Russell
  - Azteca
- Architect: HDR (Interior) + CORGAN (Skin & Public Areas), Dallas TX
- Structural Engineers:
  - AG&E LLC w/ DATUM GOJER Dallas, TX
  - Testing Lab - Terracon
- Curtain Wall Consultant: MGI
- Cladding Subcontractors:
  - Win-Con, Harmon, NOWI
    - CDC Inc, CES Inc (Cladding Engineers)
  - ATI – Exterior Cladding Testing



# New Parkland Hospital, Dallas Texas

## DESIGN CONSIDERATIONS

- LARGE BUILDING LAYOUT/FOOTPRINT
- **LARGE AMOUNT OF GLASS**
- USE OF FRITTED GLASS
- BUILDING FAÇADE UNIQUENESS
- **CONTROLLING THE INTERIOR ENVIRONMENT**
- CO-ORDINATION BETWEEN FAÇADE AND STRUCTURE
- **MULTIPLE EXTERIOR COMPONENTS: CURTAIN WALL, GLAZING, ALUM PANELS, LOUVERS, CURTAIN WALL, STRUCTURAL STEEL COMPONENTS**
- SEVERAL TRANSITIONS

## New Parkland Hospital, Dallas Texas

### DESIGN COMPONENTS

- TESTING (WIND TUNNEL)
- ENGINEERING SYSTEM AND SUPPORT
- COMPONENT PROFILES
- FUNCTIONAL MOCK-UP
- TESTING (LABORATORY STRUCTURAL TESTS)
- TESTING (ONSITE) –VISUAL

## New Parkland Hospital, Dallas TX



**PROPOSED MODEL RENDERING**

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# New Parkland Hospital, Dallas TX



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Rendering

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## New Parkland Hospital, Dallas TX

Actual  
Construction



## DESIGN CONSIDERATIONS

- ❖ Wind Pressure
- ❖ Building Movements
- ❖ Interfaces / Intersections



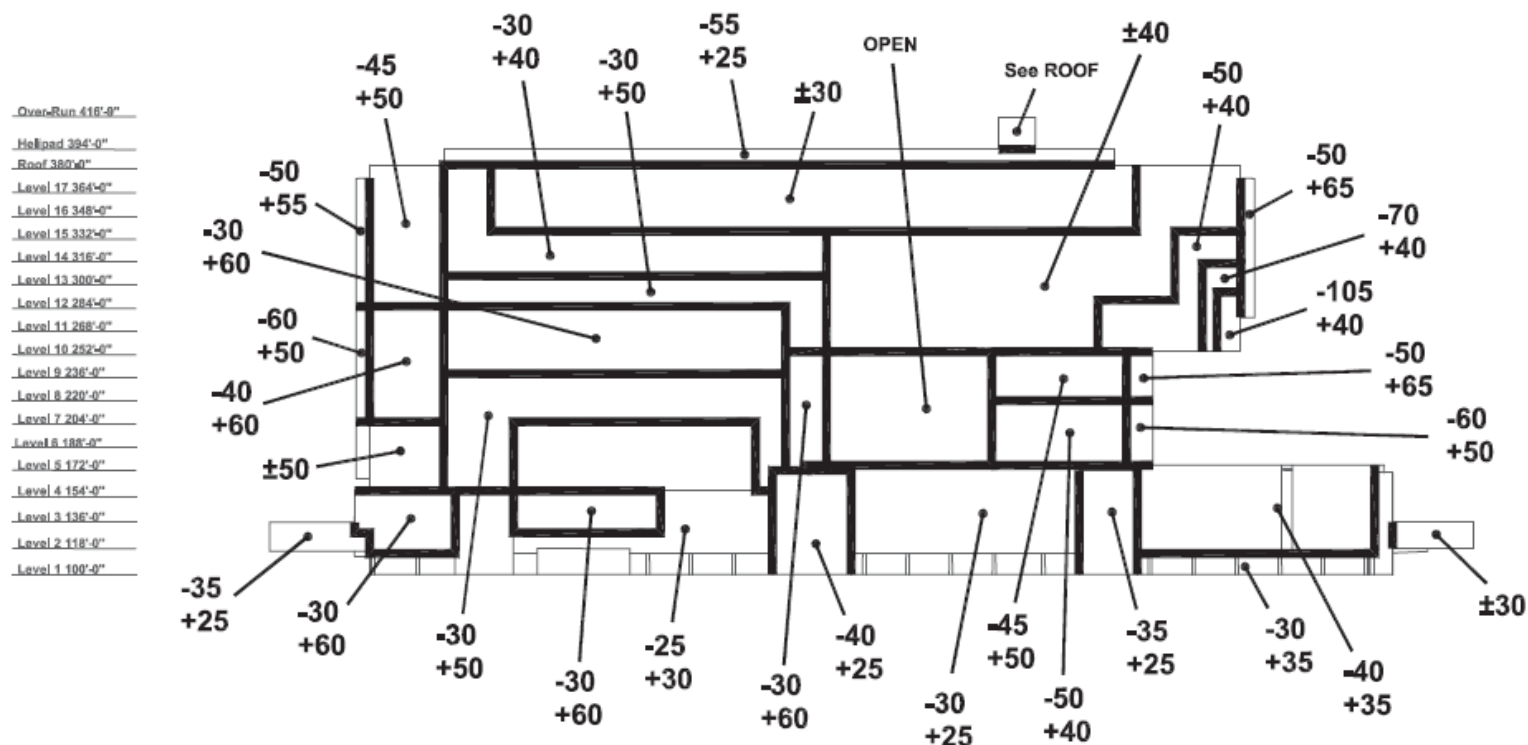
# New Parkland Hospital, Dallas TX



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ZONED BY CPP, Inc.  
PROJECT 5418  
SEPTEMBER 2010



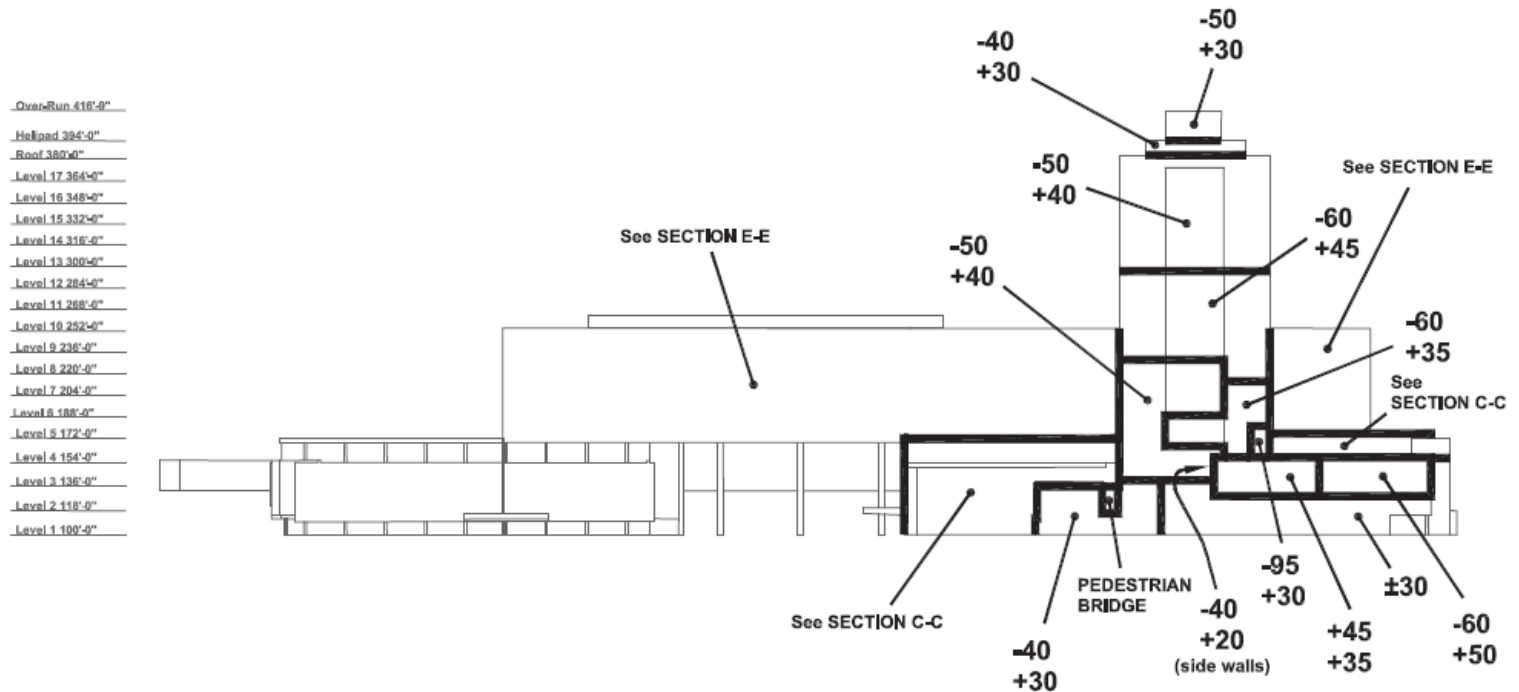
For differential pressures across parapets, roof screens, helipad overhangs,  
roof overruns, canopies and pedestrian bridges, refer to Table 4.  
For pressures on roofs, refer to Figure 12.  
For pressures on soffits, refer to Table 3.

**NORTH ELEVATION**

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EAST ELEVATION



New Parkland Hospital, Dallas  
Texas



New Parkland Hospital, Dallas  
Texas

- 2.2M SQ BLDG HOPITAL
- 17 STORIES + 1; 300 FT TALL
  - Basement & (2) Helipads on Roof
- Over 8 ACRES OF GLASS
- OVER 2,000 WORKERS AT PEAK
- 45 ELEVATORS
- 7,000 DOORS
- 32,000 Light Fixtures
- 6,000 Plumbing Fixtures

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New Parkland Hospital, Dallas  
Texas

- Current Building Status is 99% “Complete”
  - Awarded TCO from City of Dallas on 7-21-14
- 7,000 + PEOPLE THRU ORIENTATION
- 6,250,000 + MAN HOURS TO DATE
- POURED CONCRETE EVERY WEEK FOR 2 YRS (160K CY Poured in Total)
- POURED FLOOR EVERY 2 WEEKS;
- MAINTAIN 100 YDS/HR DURING POURS



New Parkland Hospital, Dallas  
Texas

- 865 PRIVATE BEDS
- 96 NICU BEDS
- 48 LDRS BEDS
- 1009 TOTAL BEDS
- 108 EXAM -EMERGENCY ROOMS
- 27 OPERATING ROOMS
- 3800 PARKING SPACES; 1800  
STAFF, 2000 VISITORS

New Parkland Hospital, Dallas  
Texas

- 42,000 DATA OUTLETS
- 10,000 STRANDS OF FIBER OPTIC CABLE
- 8.5 MILES OF CABLE TRAYS
- 575 MILES OF CONDUIT
- 43,300,000 LBS OF REBAR (if #8 BARS, OVER 3073 MILES)
- 852 Cameras
- 1397 Card Readers

# CONSTRUCTION

New Parkland Hospital, Dallas  
Texas  
WHERE TO START

PROJECT STARTED IN WINTER OF 2010

- UNDERSTAND OWNERS EXPECTATIONS
- DEVELOP A STRONG CONCEPT
- DEVELOP A GOOD TEAM FOCUSED ON THE PROJECT TASKS
- KNOW WHEN/HOW TO DELEGATE
- WORK WITH THE GC ON SCHEDULES
- ANTICIPATE FIELD CONDITIONS ADAPTATION

# New Parkland Hospital, Dallas

Texas  
**January 2011**





Aug /Sep 2011



FIRST COLUMN

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# New Parkland Hospital, Dallas Texas



## **CONCRETE POURS**

**“Very Challenging in the Summer of 2011”**

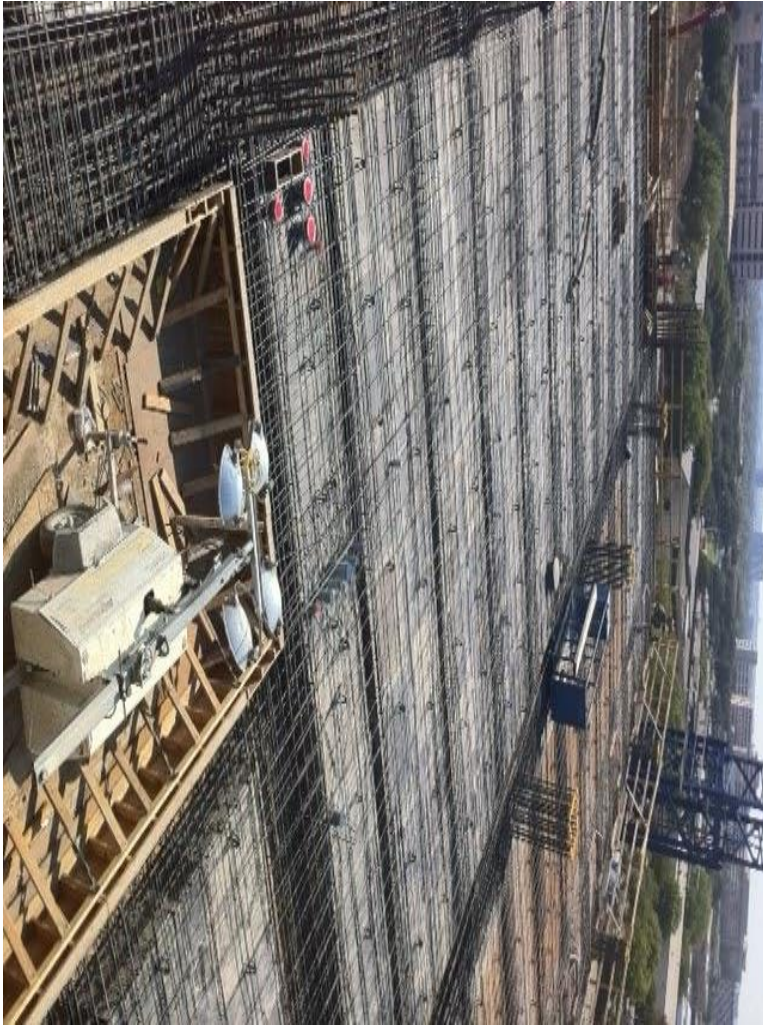




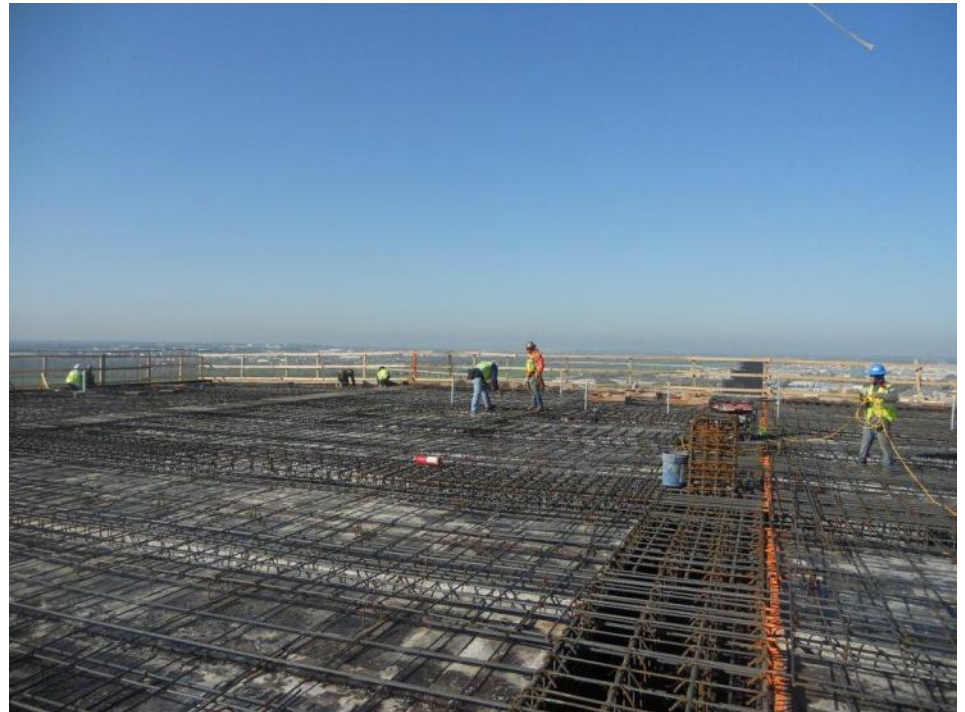
# New Parkland Hospital, Dallas Texas







**REBAR EVERYWHERE!!**



## THE CONCEPT OF RELATIVE SIZE



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**Size 11 Shoes**



# New Parkland Hospital, Dallas Texas September 2011





# New Parkland Hospital, Dallas Texas January 2012





# New Parkland Hospital, Dallas

## Texas

### March 2012





# New Parkland Hospital, Dallas

June 2012





# New Parkland Hospital, Dallas Texas

EXTENSIVE ENGINEERING FOR  
THE CANTILEVERED WALL



New Parkland Hospital, Dallas  
Texas  
**POST TENSION WALLS CREATE CANTILEVER**





## New Parkland Hospital, Dallas



750 FT of Wall

160' Up in the air

Walls were 4' thick

800 CY per pour @ 10" slump

3,200 CY of concrete

Used Maturity Meters to measure heat



Oct 2012



**BARA** | Building Parkland

*New Parkland Hospital  
West Campus Development*

Print #121002445

Date: 10/02/12

Lat/Lon: 32.811880 -96.834808



Aerial Photography, Inc. 954-568-0484

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Apr 2013



**B A R A** | Building Parkland

*New Parkland Hospital  
West Campus Development*

Print #130430762  
Date: 04/30/13  
Lat/Lon: 32.811880 -96.834808

 Aerial Photography, Inc. 954-568-0484

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Sep 2013



**BARA** | Building Parkland

*New Parkland Hospital  
West Campus Development*

Print #130903457  
Date: 09/03/13  
Lat/Lon: 32.811880 -96.834808

 Aerial Photography, Inc. 954-568-0484

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Sep 2013



**B A R A** | Building Parkland

*New Parkland Hospital  
West Campus Development*

Print #130903459  
Date: 09/03/13  
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# New Parkland Hospital, Dallas

## Texas

### March 2014



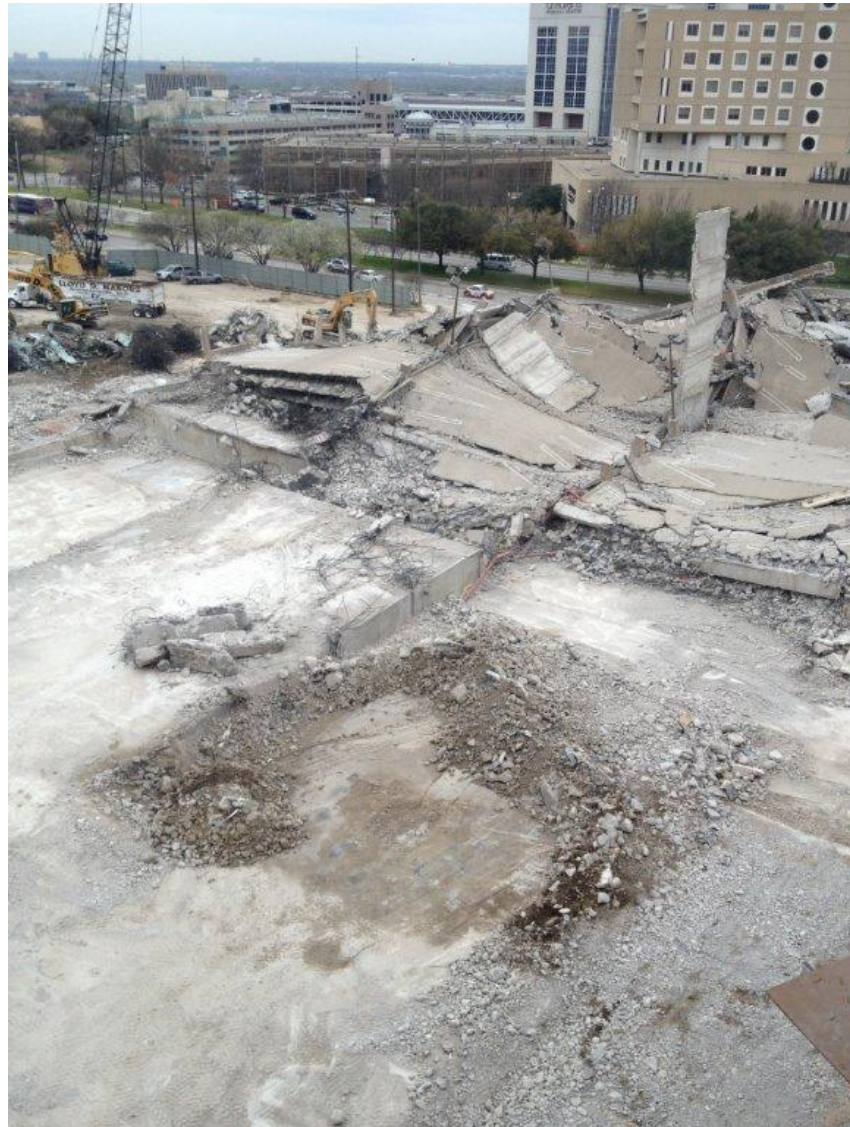
# CONSTRUCTION CHALLENGES

Feb 2012

Wish Clinic Area starting

Demoed OLD parking garage

ONE SHEAR WALL KEPT  
STANDING



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## Mega Shoring Columns



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LOTS OF SHORING  
LOTS OF SCAFFOLDING



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HALF WAY  
POUR

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HALF WAY POUR



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2000 workers  
at max rate



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# BED TOWER AND WISH CLINIC

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# PRINT GLASS FABRICATIO N

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## INSTALLED

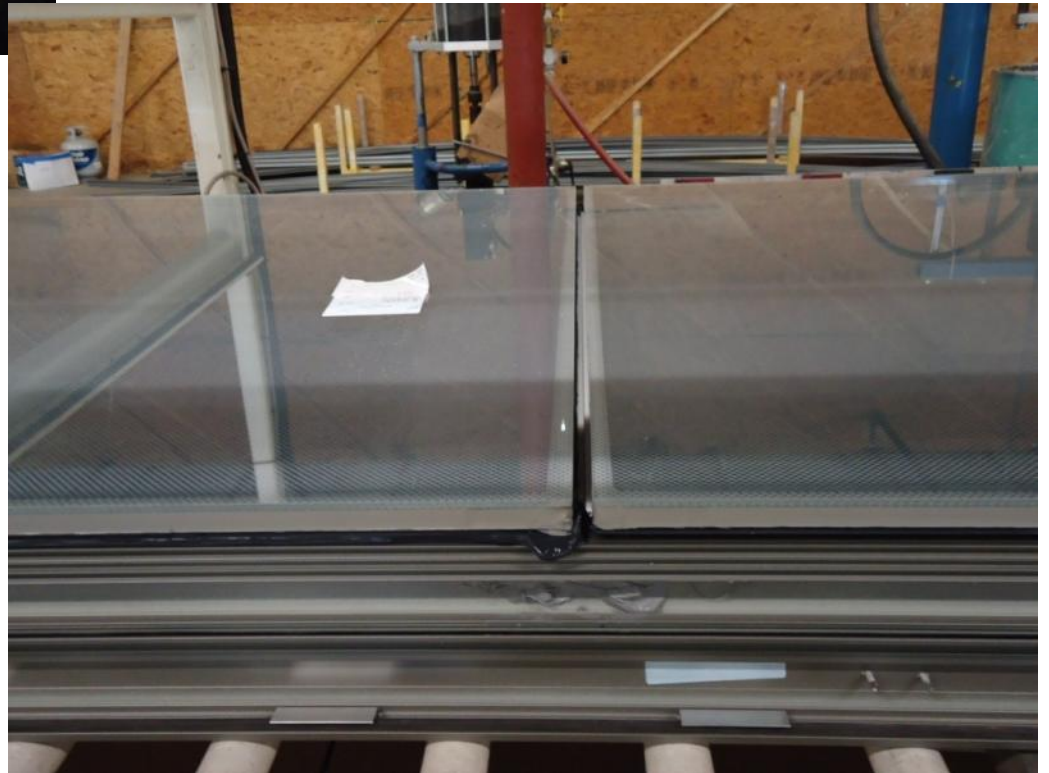


# CURTAIN WALL FABRICATION

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CHECKING GLASS COLOR  
VARIATION

# FUNCTIONAL MOCKUPS



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TRY TO INCORPORATE ELEMENTS THAT OF INTEREST



# LABORATORY MOCKUPS



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CCL Inc

# JOB SITE INSTALLATIO N

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## INSTALLING UNITIZED CURTAIN WALL



TWO UNITS  
INSTALLED



LOWER PODIUM

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**INSTALLING UNITIZED CURTAIN  
WALL**

**INTERIOR VIEW**



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DINING AREA

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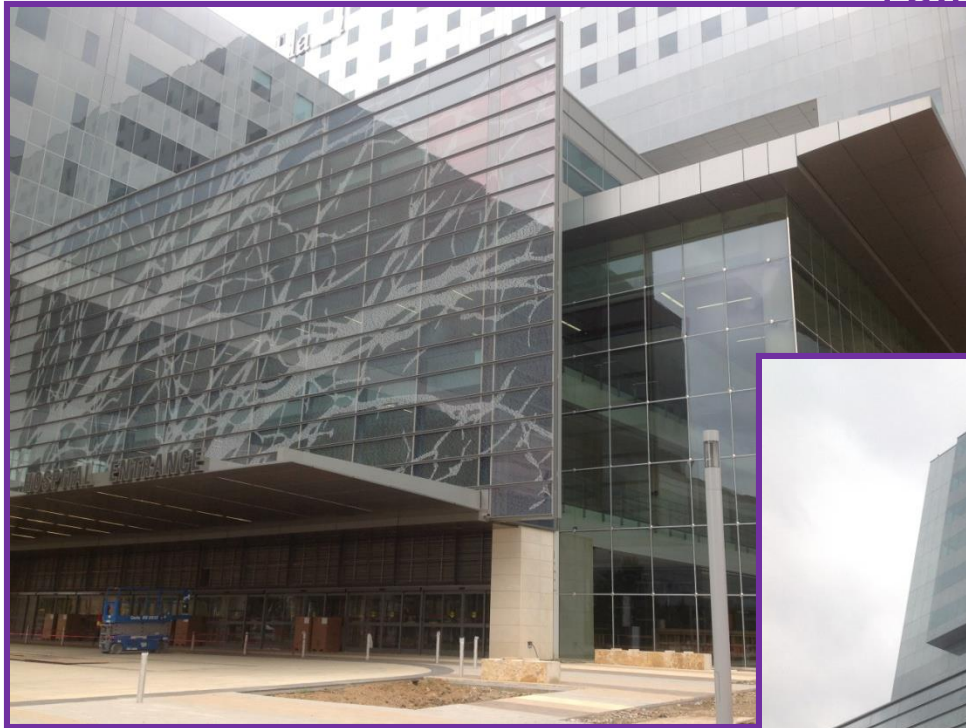
## PRINT GLASS WALL



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# New Parkland Hospital, Dallas Texas

PRINT GLASS WALL



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HOW COOL IS THE EFFECT  
ON GLASS

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# PRINT GLASS WALL



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Names used to generate the graphics on glass



**CONSTRUCTION**



**AT THE LINK BRIDGE  
ACROSS THE ROAD**

**CONSTRUCTION**



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**CURRENT**



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Texas



**TREMCO AIR BARRIER WITH ETA  
(ENGINEERED TRANSITION ASSEMBLY)  
SYSTEM USED ON THE EXTERIOR OF THE  
PODIUM & WISH CLINIC BUILDINGS**





# New Parkland Hospital, Dallas

Tower

**ALUM LOUVERS**



**ALUM COMPOSITE PANELS**

# New Parkland Hospital, Dallas Texas

## **ROOFING**

SOPREMA, torchable grade, 2-Ply Modified Bitumen Membrane Roofing system with 2 layers of ridge board insulation and tapered insulation





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**ROOFING/HELIPAD**

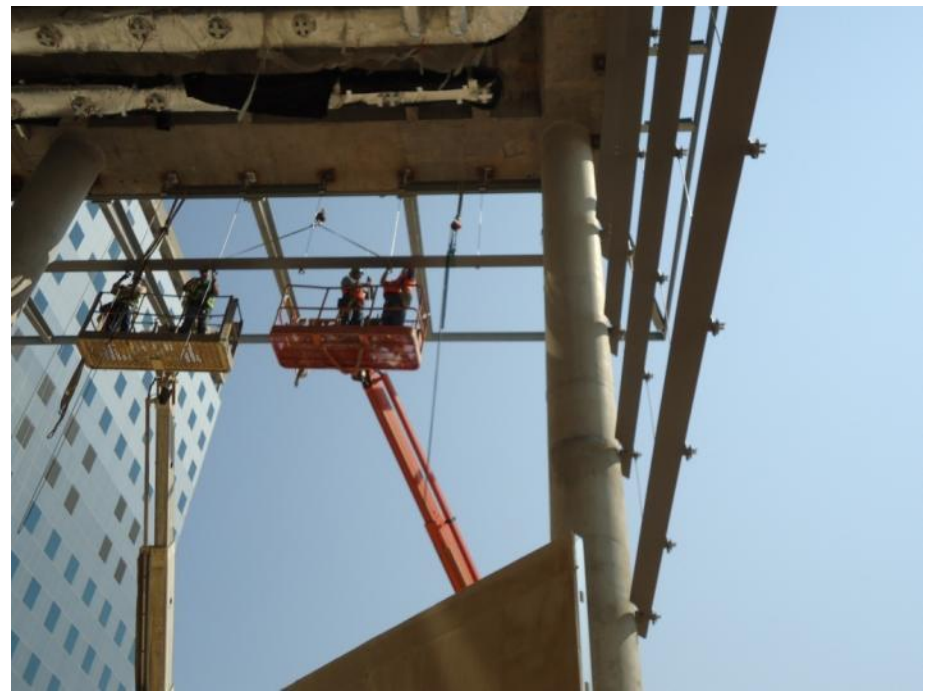






## ALL-GLASS WALL CONSTRUCTION

- FLAT PLATES
- TENSION RODS



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## ALL-GLASS WALL

Harmon; W & W Glass

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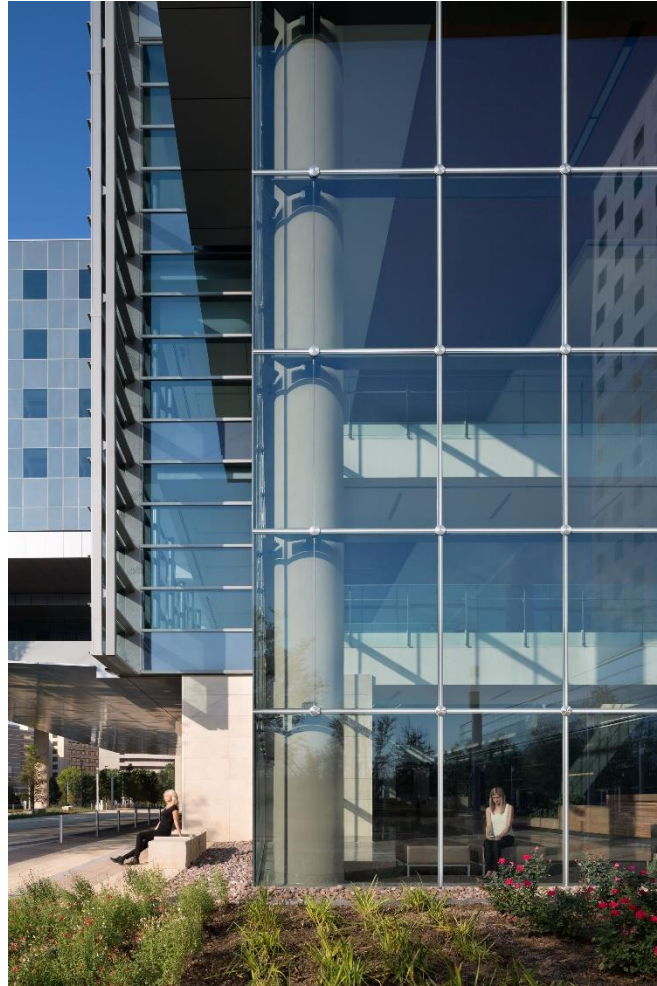






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## ALL-GLASS WALL





# ALL-GLASS WALL INTEGRATED WITH LANDSCAPE



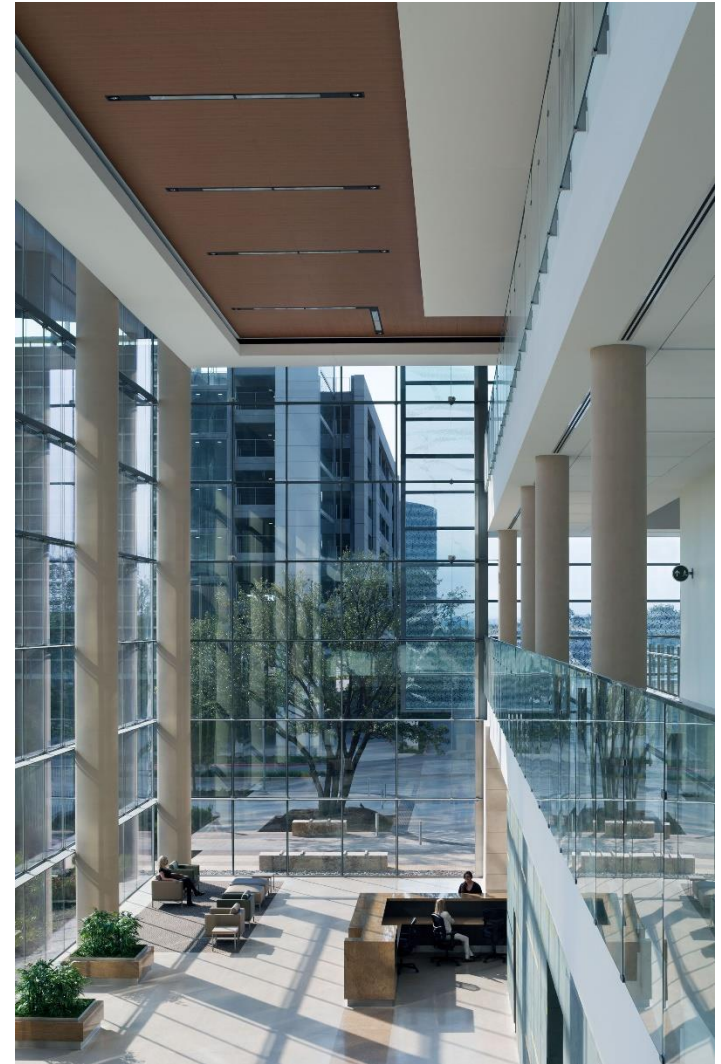
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ALLOWING GREAT DAYLIGHT

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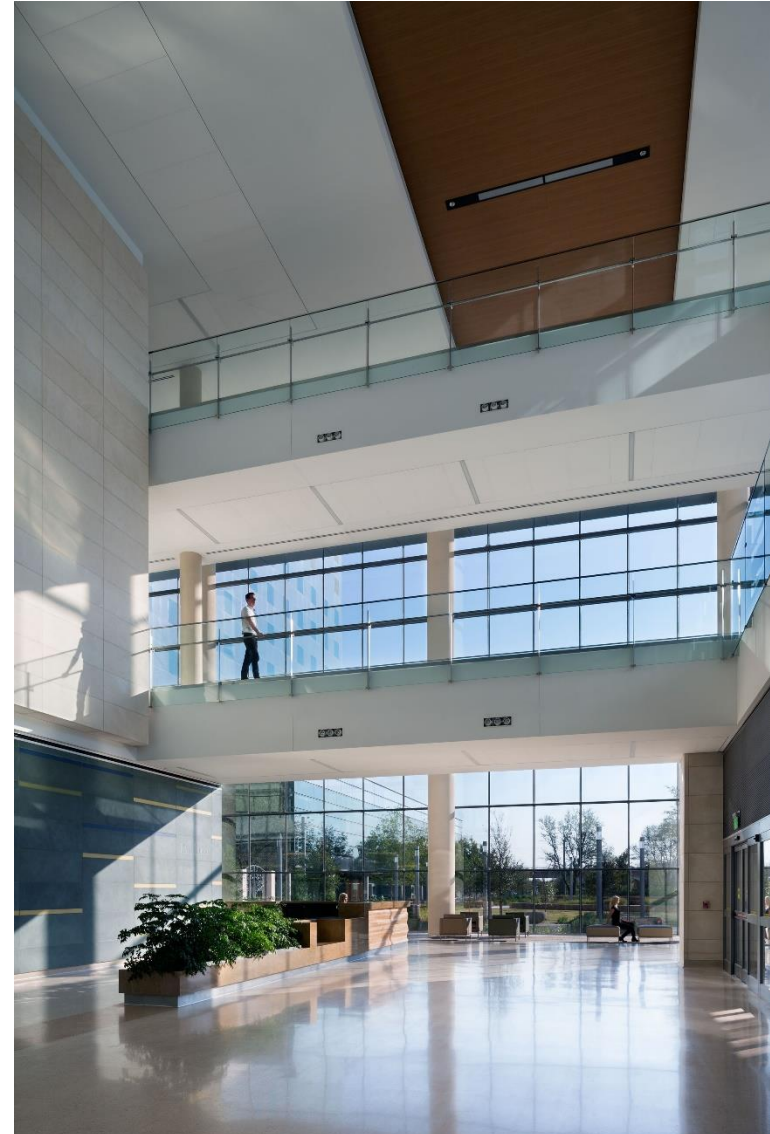


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INTEGRATING STRUCTURE WITH AESTHETICS



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## WISH CLINIC CONSTRUCTION

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# WISH CLINIC



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# WISH CLINIC 2-LEVEL LINK BRIDGE



SCALE IS DECEPTIVE

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ALUM LOUVERS



ALUM COMPOSITE PANELS

NOW INC

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# JOBSITE FIELD TESTING



# DIFFERENTIAL PRESSURE TESTING AIR/WATER



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# WATER TESTING



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**AT**

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# DYNAMIC WATER TESTING







TIME  
TO  
GO  
CHECK  
OUT  
THE  
BUILDING

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# PATIENT ROOM CORRIDOR

## 6<sup>th</sup> Floor dedicated Burn Floor



# New Parkland Hospital, Dallas

Texas





## New Parkland Hospital, Dallas

### LABOR AND DELIVERY ROOM

Last year, Parkland delivered 10,236 babies. More space, including 44 labor and delivery rooms, will make deliveries easier and safer. Each room features separate spaces for the mother, family members and baby.



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Texas  
CUTTING-EDGE OPERATING ROOM



**LED LIGHTS WITH CAMERA**

Surgery becomes nearly shadow-free under intense LED lights, making the surgical field easier to see. A video camera at the center allows real-time remote viewing of every surgery, and footage can also be reviewed later.

[thinglink.com](http://thinglink.com)





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## WISH CLINIC TRANSITION

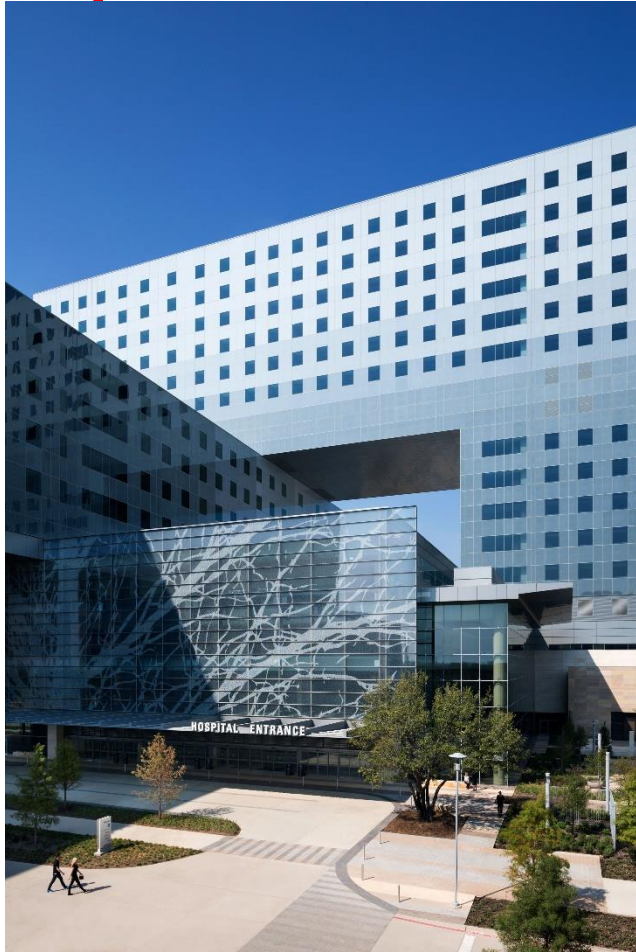




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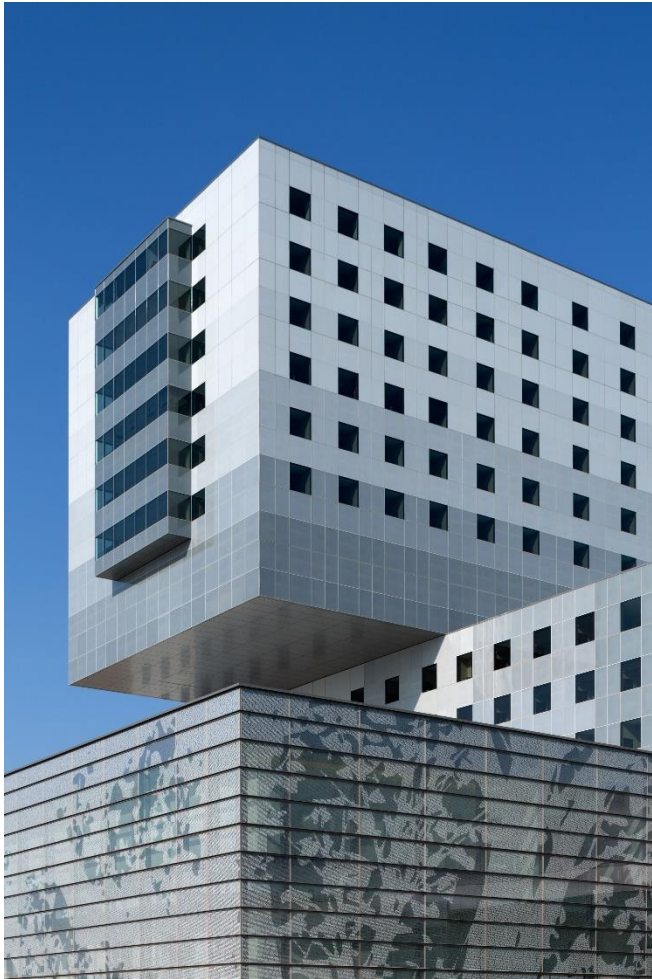


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The large overhang  
doesn't touch the  
lower building

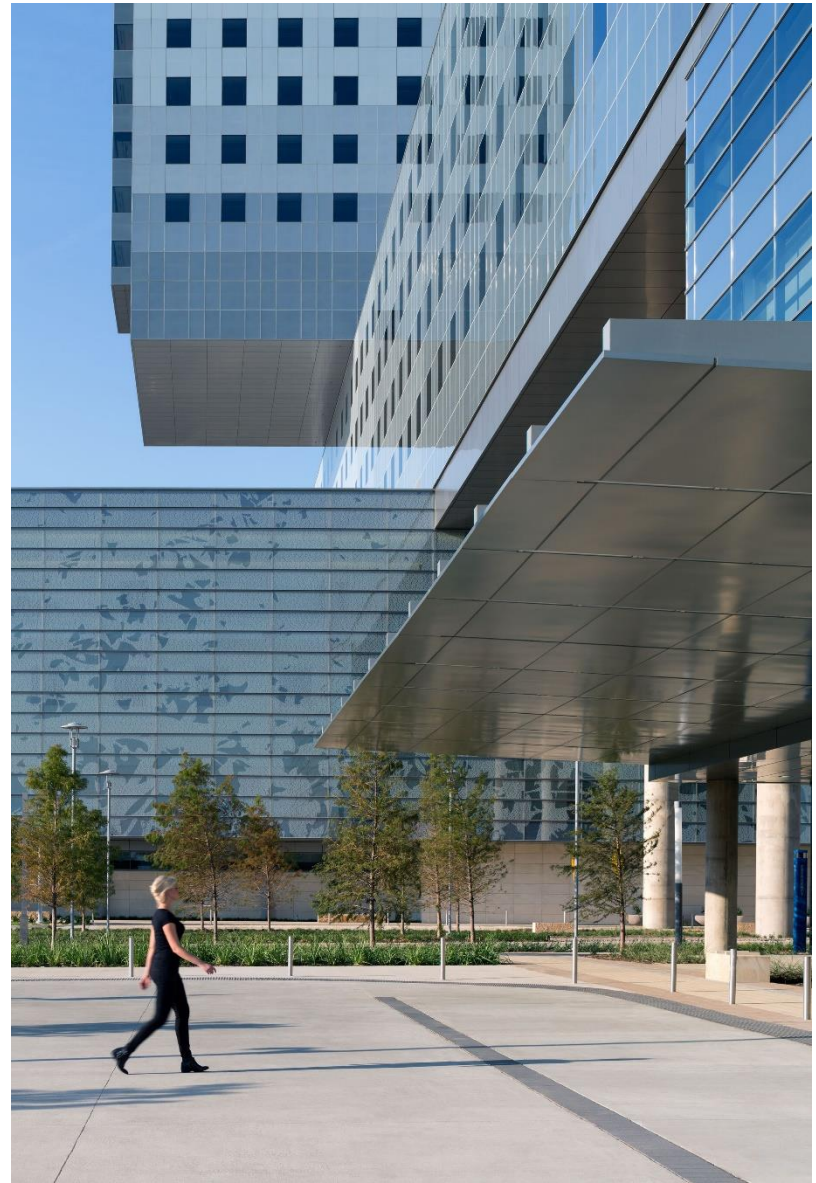




The large overhang  
doesn't touch the  
lower building

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CHAPEL WITH LIMESTONE INTEGRATED TO  
CONTRACT METAL AND GLAZING

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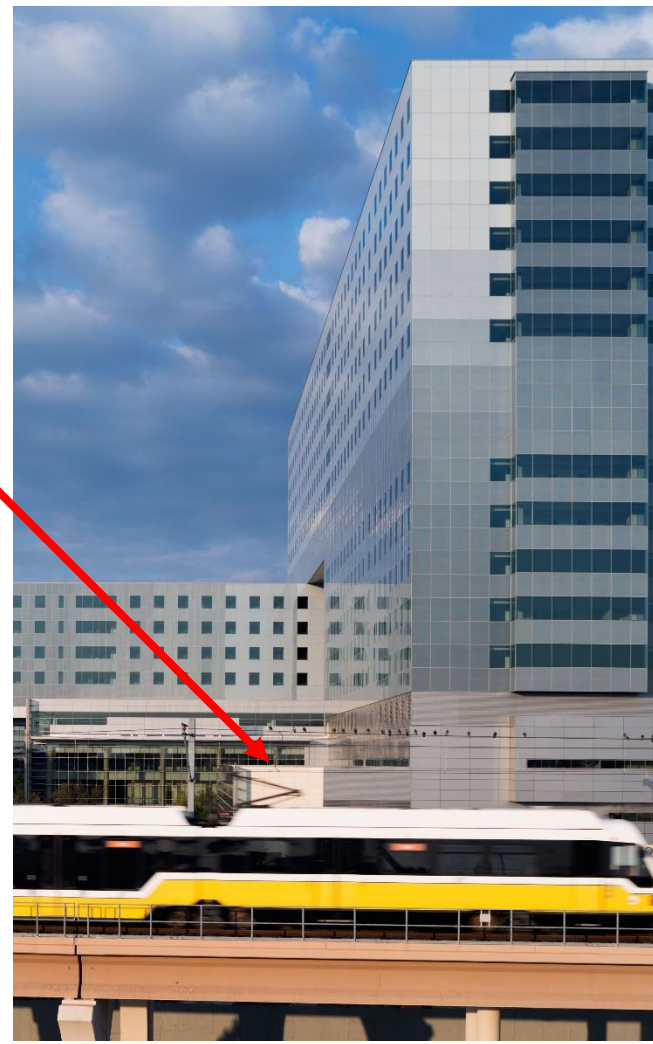






THE LANDSCAPE OF THE PROPERTY IS INFLUENTIAL ON THE **CALMING** EXPERIENCE NEEDED AT THE FACILITY





NEED TO PLAN FOR **PUBLIC TRANSPORTATION**  
OPTIONS – LIGHT RAIL & BUS ROUTES SERVE THE  
FACILITY

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SUMMARY

- VERY CHALLENGING PROJECT
- PROFILE HAS LOTS OF TRANSITIONS
- FIELD QC WAS VERY IMPORTANT
- FIELD TESTING WAS IMPLEMENTED AT TYP AND TRANSITION AREAS
- **WELL COORDINATED PROJECT, GIVEN THE SCALE**
- REQUIRED FOCUSED EXCHANGES BETWEEN GC AND SUBS FOR COORDINATION



HOW COOL IS THIS?



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Thank You

Questions?