Kimley»Horn

MEMORANDUM

To: James Chancellor, P.E. – Town of Fairview

From: Thomas G. Coppin, P.E.

Kimley-Horn and Associates, Inc.

Date: June 25, 2024

Subject: McKinney LDS Temple – Preliminary Drainage Study

This Preliminary Drainage Study summarizes the design approach for the storm drainage and detention basin sizing for the proposed McKinney LDS Temple Project.

The McKinney LDS Temple is located on 8.16 ac in the Town of Fairview on the north side of Stacy Road and its intersection with River Oaks Drive. The site consists of an undeveloped grass field with a row of trees along the north property line. The site currently drains from south to north, away from Stacy Road, and is generally divided equally east and west by ridge located at the center of the property. Runoff from the site is currently directed to the northeast and northwest corners of the property where is flows across the adjacent properties. The existing drainage areas and runoff amounts are summarized on the accompany *Existing Drainage Area Map* (**Exhibit 1**).

The proposed site grading will honor the historic drainage patterns of the property. The temple will be located on the ridge at the center of the property, and drainage will be directed east and west through the parking lots to the landscaped areas that boarder the property. Depression in the landscaping will direct runoff to inlets and to storm drain lines that will convey runoff to a detention basin at the north end of the property. Two additional storm drains adjacent to the temple will direct roof runoff directly to the detention basin. The proposed drainage areas and runoff amounts are summarized on the accompanying Proposed *Drainage Area Map* (**Exhibit 2**).

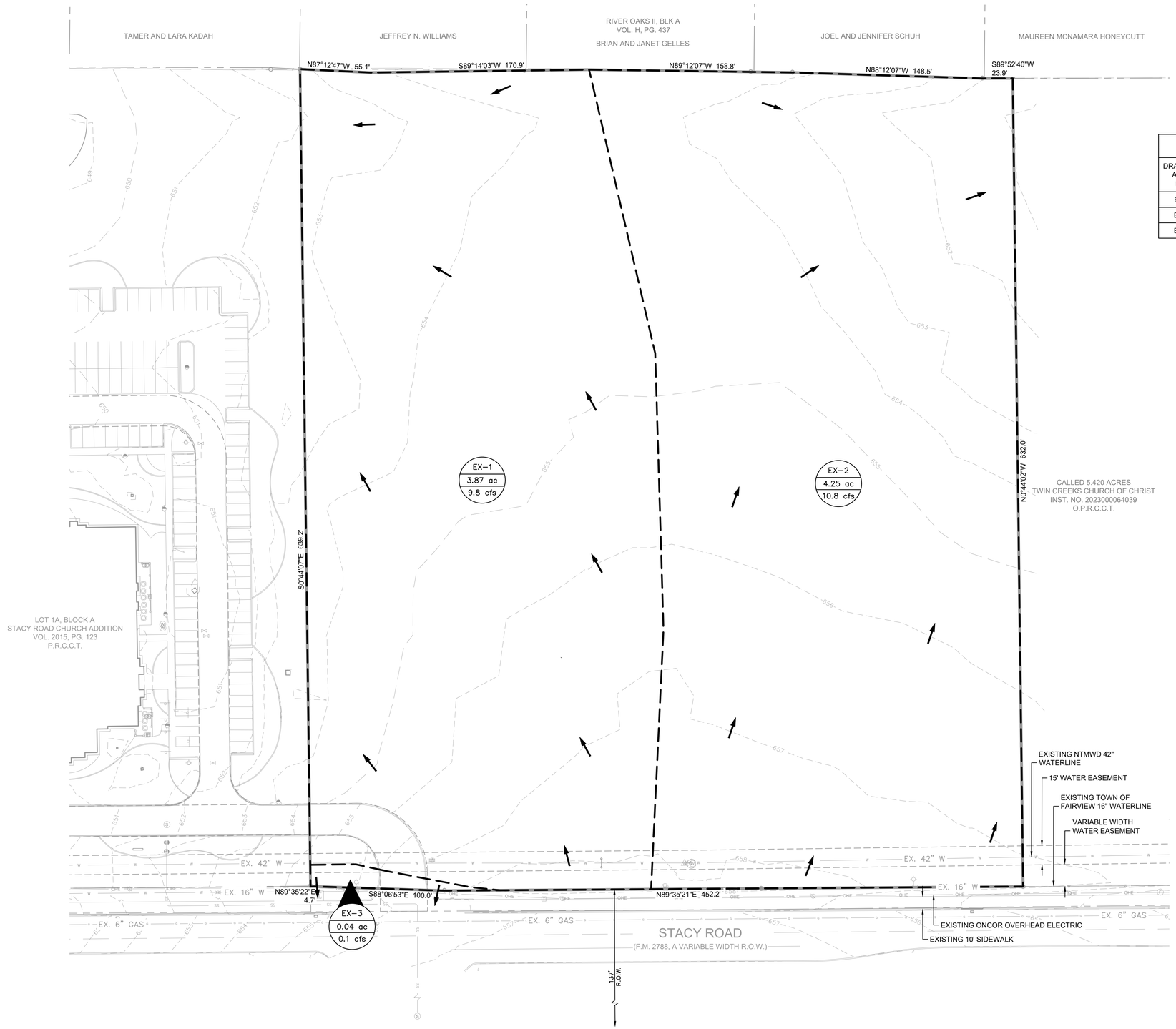
The detention basin will be sized to reduce site runoff to pre-development levels for the 100-year storm event. Smaller storm events will be fully contained within the basin and will drain west via a low flow drain, beneath the existing LDS chapel lawn, to the existing outfall structure that currently serves the chapel. From there flows will continue to the west, across the Chase Oaks Church site as they have historically. Low flows from the temple detention basin will be limited to pre-development flows currently draining to the west. Runoff from storm events equal or greater than the 100-year event will overtop the detention basin via two concrete spillways and drain east and west as they have

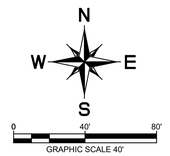
historically at the same rates as pre-development conditions. The proposed storm drain plan is shown in the accompanying *Proposed Storm Drain Plan* (**Exhibit 3**).

Attachments: Exhibit 1 – Existing Drainage Area Map

Exhibit 2 – Proposed Drainage Area Map

Exhibit 3 – Proposed Storm Drain Plan





DRAINAGE AREA TABLE

DRAINAGE AREA NO.	AREA (ac)	ANTECEDENT FACTOR	RUNOFF COEFFICIENT "C"	RAINFALL INTENSITY "I"100 (in/hr)	TIME OF CONCENTRATION (minutes)	TOTAL FLOW Q100 (cfs)
EX-1	3.87	1.00	0.35	7.26	17.2	9.8
EX-2	4.25	1.00	0.35	7.26	17.2	10.8
EX-3	0.04	1.00	0.35	7.26	17.2	0.1

LEGEND

- X-1 / 9.9 ac / 5.5 cfs — AREA DESIGNATOR, AREA IN ACRES, Q100 FLOW IN CFS
- A-1 — INLET NUMBER
- PROPERTY LINE
- EXISTING STORM DRAIN LINE
- PROPOSED DRAINAGE DIVIDE
- PROPOSED FLOW DIRECTION
- 555 — EXISTING CONTOUR

DRAINAGE DESIGN CRITERIA

Q100 = C*I*A

Q = FLOW IN CUBIC FEET PER SECOND (CFS)

C = RUNOFF COEFFICIENT = 0.35 (UNDEVELOPED)
0.65 (DEVELOPED)

I = INTENSITY (TIME OF CONCENTRATION = TC)

TC OF 17.2 MINUTES (UNDEVELOPED) = 7.26 IN/HR
TC OF 10.0 MINUTES (DEVELOPED) = 8.74 IN/HR

A = DRAINAGE AREA IN ACRES

BENCHMARKS

BM 1: "X" CUT SET ON TOP OF A CONCRETE CURB AT THE NOSE OF A PARKING MEDIAN LOCATED NORTH OF THE CHURCH BUILDING LOCATED AT 651 E. STACY ROAD. THE MARK IS APPROXIMATELY 100 FEET EAST OF THE WEST EDGE OF THE PARKING LOT.
ELEV. = 649.67

BM 2: "X" CUT SET ON TOP OF A CONCRETE CURB ON THE EAST EDGE OF THE PARKING LOT LOCATED AT 651 E. STACY ROAD. THE MARK IS APPROXIMATELY 454 FEET NORTH OF THE NORTH CURB LINE OF E. STACY ROAD.
ELEV. = 651.87

BM 3: "X" CUT SET ON TOP OF A CONCRETE CURB ON THE EAST EDGE OF THE PARKING LOT LOCATED AT 651 E. STACY ROAD. THE MARK IS APPROXIMATELY 272 FEET NORTH OF THE NORTH CURB LINE OF E. STACY ROAD.
ELEV. = 651.85

EXHIBIT 1

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
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TEXAS REGISTERED ENGINEERING FIRM F-928

PRELIMINARY
FOR REVIEW ONLY
Not for construction or permit purposes.
Kimley»Horn
Engineer THOMAS G. COPPIN
P.E. No. 126275 Date 04/26/2024

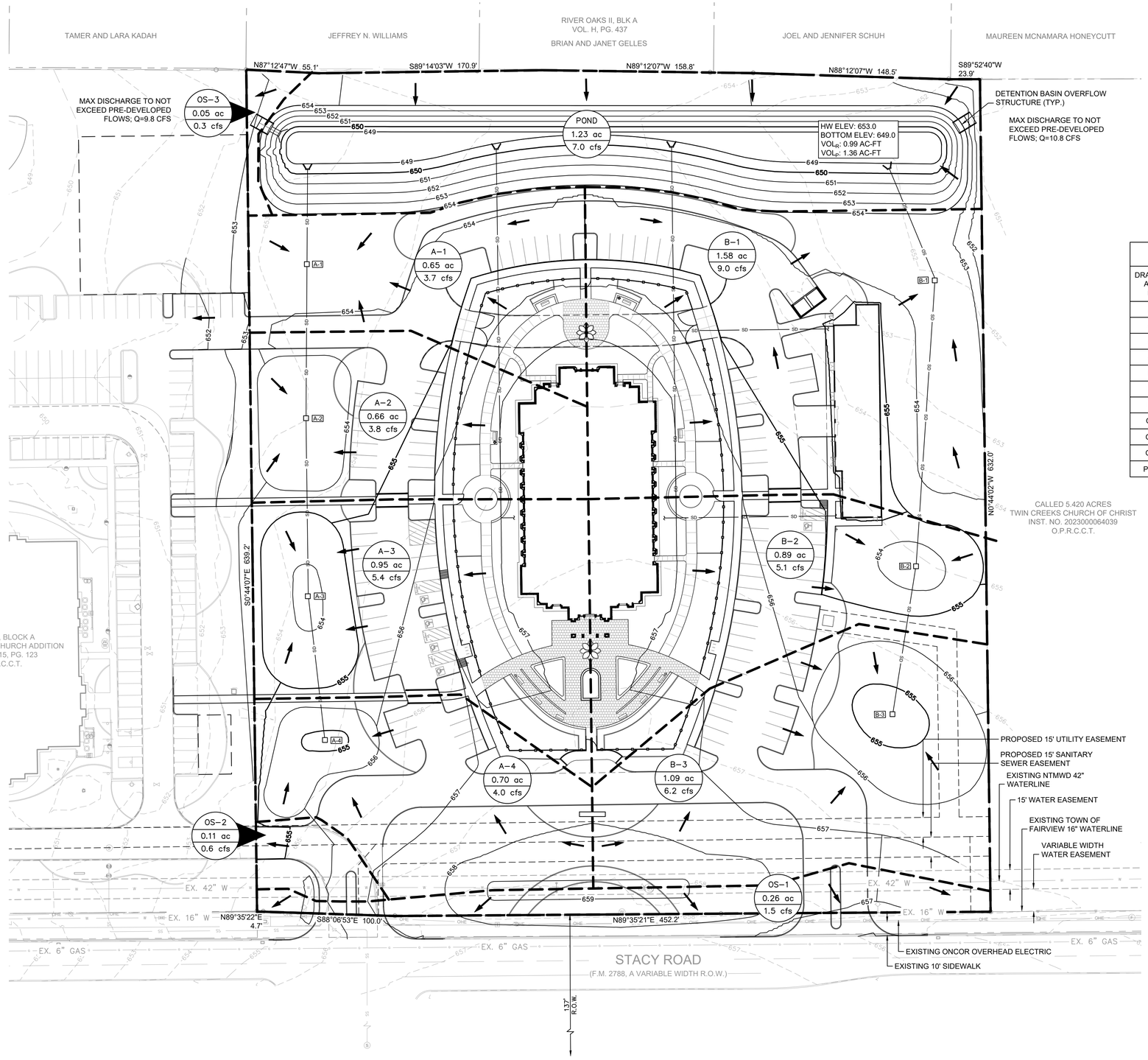
KHA PROJECT 061275909
DATE APRIL 2024
SCALE: AS SHOWN
DESIGNED BY: MRM
DRAWN BY: JTW
CHECKED BY: TGC

EXISTING DRAINAGE AREA MAP

McKINNEY TEMPLE

TOWN OF FAIRVIEW
COLLIN COUNTY, TEXAS

SHEET NUMBER
1 OF 1



N
W E
S

0 40' 80'
GRAPHIC SCALE 40'

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A-1	0.65	1.00	0.65	8.74	10.0	3.7
A-2	0.66	1.00	0.65	8.74	10.0	3.8
A-3	0.95	1.00	0.65	8.74	10.0	5.4
A-4	0.70	1.00	0.65	8.74	10.0	4.0
B-1	1.58	1.00	0.65	8.74	10.0	9.0
B-2	0.89	1.00	0.65	8.74	10.0	5.1
B-3	1.09	1.00	0.65	8.74	10.0	6.2
OS-1	0.26	1.00	0.65	8.74	10.0	1.5
OS-2	0.11	1.00	0.65	8.74	10.0	0.6
OS-3	0.05	1.00	0.65	8.74	10.0	0.3
POND	1.23	1.00	0.65	8.74	10.0	7.0

LEGEND

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WEIGHTED 'C' FACTOR

LAND USE	AREA (AC)	C-FACTOR
LANDSCAPE	4.1	0.40
IMPERMEABLE	4.1	0.98

TOTAL C = $\frac{(A1xC1) + (A2xC2)}{(A1+A2)}$

→ TOTAL WEIGHTED C FACTOR = 0.65

BENCHMARKS

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KHA PROJECT 061275909
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PROPOSED DRAINAGE AREA MAP

McKINNEY TEMPLE
TOWN OF FAIRVIEW
COLLIN COUNTY, TEXAS

SHEET NUMBER
1 OF 1

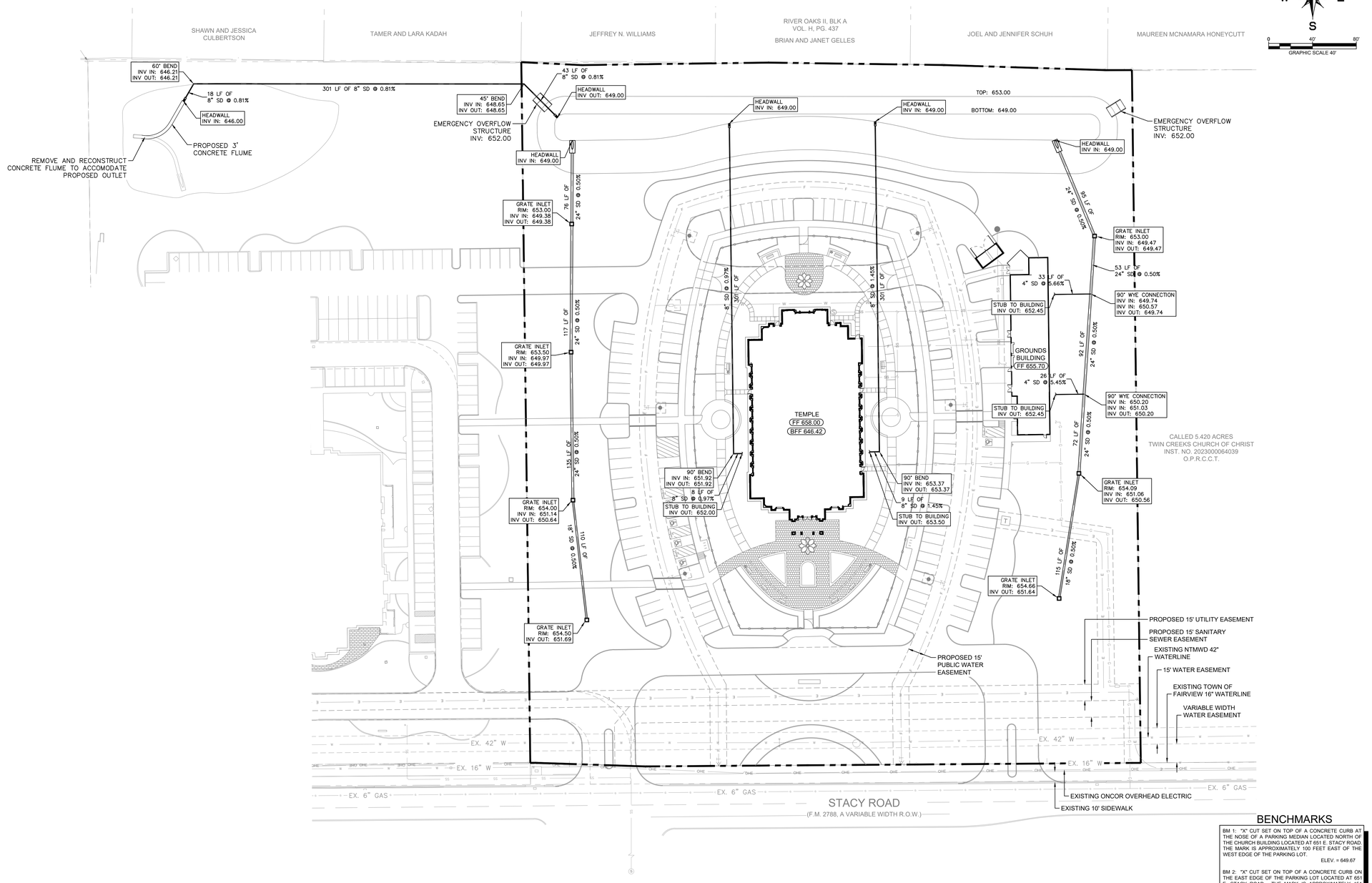

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EXHIBIT 3

Kimley»Horn

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MCKINNEY TEXAS TEMPLE

STACY ROAD, FAIRVIEW TEXAS

NOT FOR CONSTRUCTION OR REGULATORY REVIEW - PRICING AND COORDINATION ONLY

No. | Date

Revisions

Project No. 22336.00

Drawn JTW

DISCLAIMER These documents have been prepared under the direct supervision of Thomas G. Coppin, TX Registration No. 126275 and are NOT intended for regulatory approval, bidding, permitting, or construction purposes.

Checked MRM

Approved TGC

Key:

DESIGN DEVELOPMENT

Title: STORM PLAN

Scale:

Drawing No. **C-010**

Issue Date June 3, 2024

MCKINNEY TEXAS TEMPLE 6/3/2024 2:51:02 PM K:\FRI_Civil\061276909-McKinney Temple\Cad\PlanSheets\C-Storm Plan.dwg