Model reinforced isolated footings on an irregular column grid

Software: Autodesk Revit

Task statement

Model a reinforced concrete isolated footing foundation on an irregular column grid, using the supplied dimensioned diagrams diagram_01.png, diagram_01_detail01.png, diagram_01_detail02.png, diagram_01_detail03.png and diagram_01_detail04.png. Work in imperial units (feet and inches).

Grid: create eight lettered grid lines A to H and seven numbered grid lines 1 to 7. The lettered grid spacings, left to right, are A–B 7'-9", B–C 1'-9", C–D 2'-3 1/2", D–E 3'-4 1/2", E–F 5'-8 1/2", F–G 5'-10 1/2" and G–H 2'-6" (29'-3" overall). The numbered grid spacings, bottom to top, are 1–2 15'-1 1/2", 2–3 17'-1 1/2", 3–4 7'-9", 4–5 7'-1 1/2", 5–6 9'-1 1/2" and 6–7 2'-6" (58'-9" overall).

Footings: place rectangular isolated concrete footings at the column locations shown in the diagrams.

- Corner and edge footings are offset so the grid intersection lies at or near a footing edge. Examples are A/7, A/5, H/6, A/1 and H/1.
- Interior footings are roughly centred on their grid intersection. Examples are B/5, D–E/4, D/3, G/3 and G/5.
- One elongated footing along grid A spans from grid 4 to grid 3.
- Further footings are shown at B–C/7, F/7, A/2, C–D/2, G–H/2 and E/1.

Reinforcement: reinforce every footing with a bottom rebar mat running in both directions across its full plan extent. Provide column dowel or stirrup reinforcement at each column position within the footing.

Dimensions and views: dimension both grid directions in the foundation plan with the string dimensions listed above. Place North, South, East and West elevation markers around the plan.

Rubrics

- **R1:** The model shall contain eight lettered grid lines A through H.
- **R2:** The model shall contain seven numbered grid lines 1 through 7.
- **R3:** The model shall space the lettered grids A–B 7'-9", B–C 1'-9", C–D 2'-3 1/2" and D–E 3'-4 1/2".
- **R4:** The model shall space the lettered grids E–F 5'-8 1/2", F–G 5'-10 1/2" and G–H 2'-6".
- **R5:** The model shall space the numbered grids 1–2 15'-1 1/2", 2–3 17'-1 1/2" and 3–4 7'-9".
- **R6:** The model shall space the numbered grids 4–5 7'-1 1/2", 5–6 9'-1 1/2" and 6–7 2'-6".
- **R7:** The model shall contain at least 15 rectangular isolated concrete footings placed at grid intersection locations.
- **R8:** The model shall include one elongated footing along grid A spanning from grid 4 to grid 3.
- **R9:** The model shall include footings near intersections A/7, F/7, H/6, A/1, E/1 and H/1, as shown in the diagrams.
- **R10:** The model shall contain rebar elements forming a bottom mat in two orthogonal directions within each footing.
- **R11:** The model shall contain column dowel or stirrup rebar at the column position within the footings.
- **R12:** The drawing shall include string dimensions along both grid directions matching the stated grid spacings.
- **R13:** The drawing shall include four elevation markers named for the North, South, East and West directions arranged around the plan.

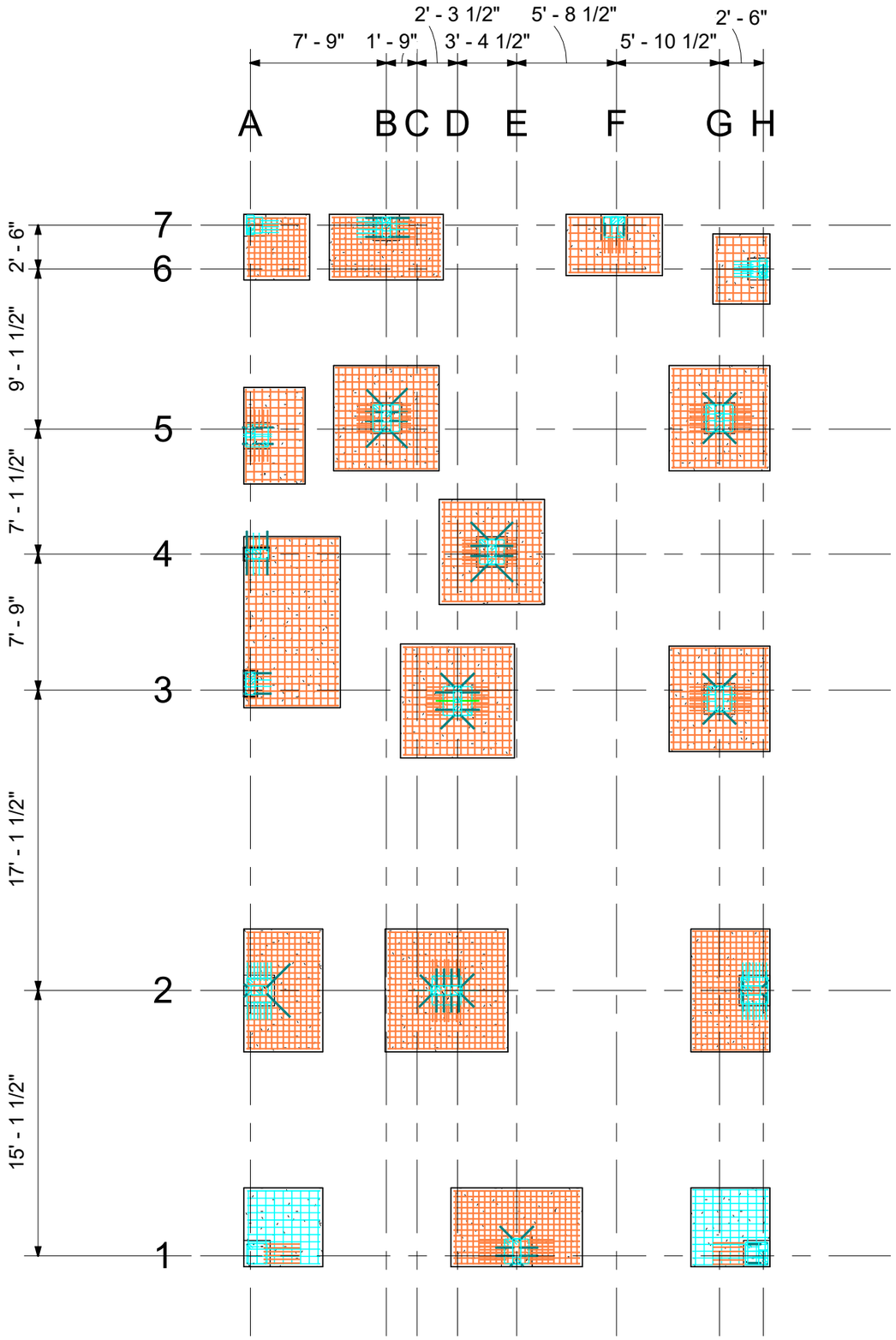
- **R14:** The model shall use imperial feet-and-inch project units.

Input files

- task_files/diagrams/diagram_01.pdf
- task_files/diagrams/diagram_01.png
- task_files/diagrams/diagram_01_detail01.png
- task_files/TYPICAL_FLOOR_DETAILS.dwg

Deliverables

- **.rvt:** output_files/project_files/STR-REBAR.rvt: A single Revit project (STR-REBAR.rvt) containing the irregular A–H / 1–7 grid, reinforced isolated footings with rebar, a dimensioned foundation plan with four elevation markers.



DRAWING TITLE

REINFORCED ISOLATED FOOTINGS ON AN IRREGULAR COLUMN GRID

GENERAL NOTES

1. DO NOT SCALE; USE FIGURED DIMENSIONS.

UNITS
AS SHOWN

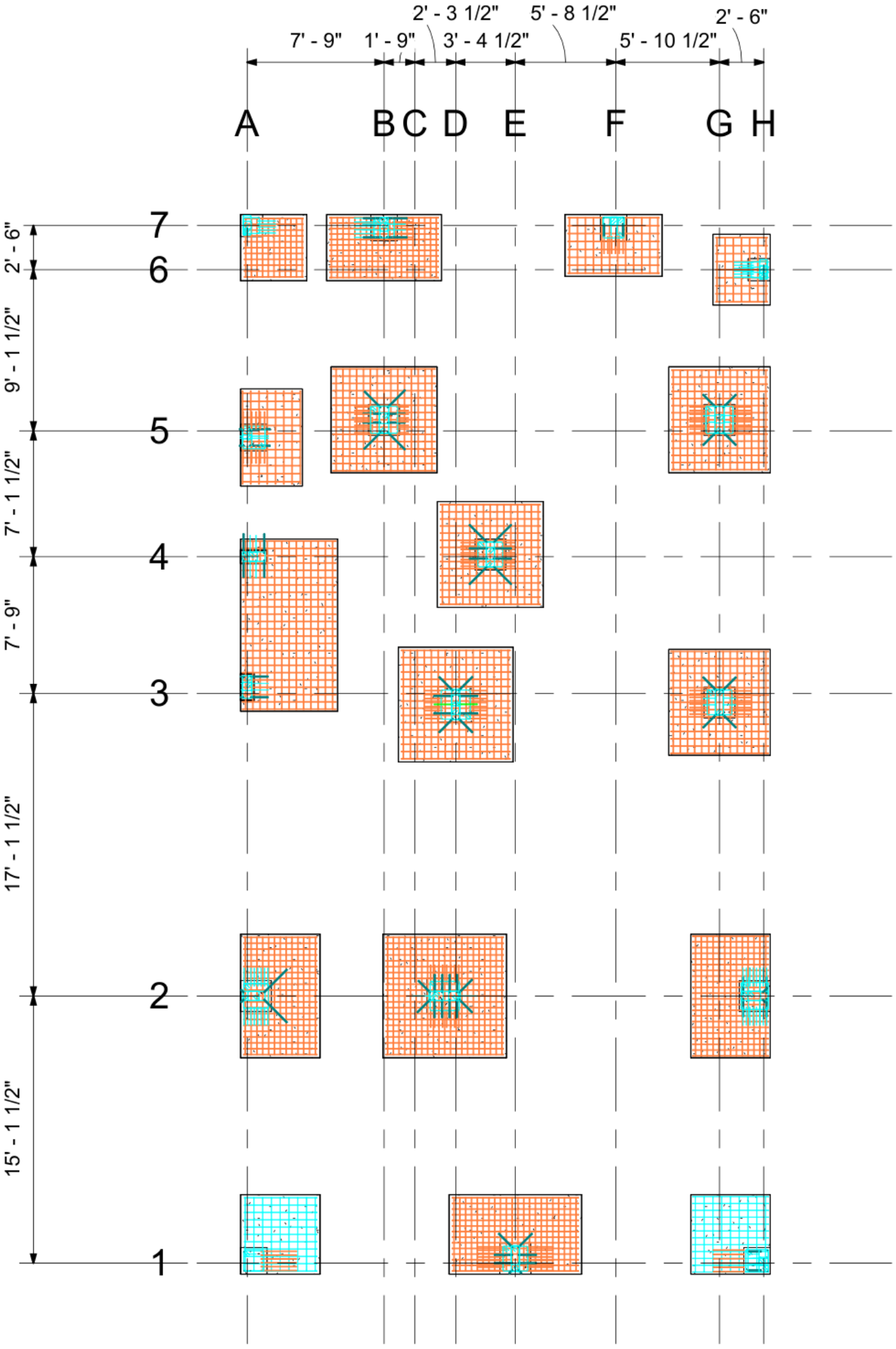
SCALE
AS SHOWN

SIZE
A3

DRAWING NO.
MKV-26A00C4B-01

SHEET
A-501

1 OF 1


7' - 9"
1' - 9"
2' - 3 1/2"
3' - 4 1/2"
5' - 8 1/2"
5' - 10 1/2"
2' - 6"
A
B
C
D
E
F
G
H
7
6
5
4
3
2
1
2' - 6"
9' - 1 1/2"
7' - 1 1/2"
7' - 9"
17' - 1 1/2"
15' - 1 1/2"