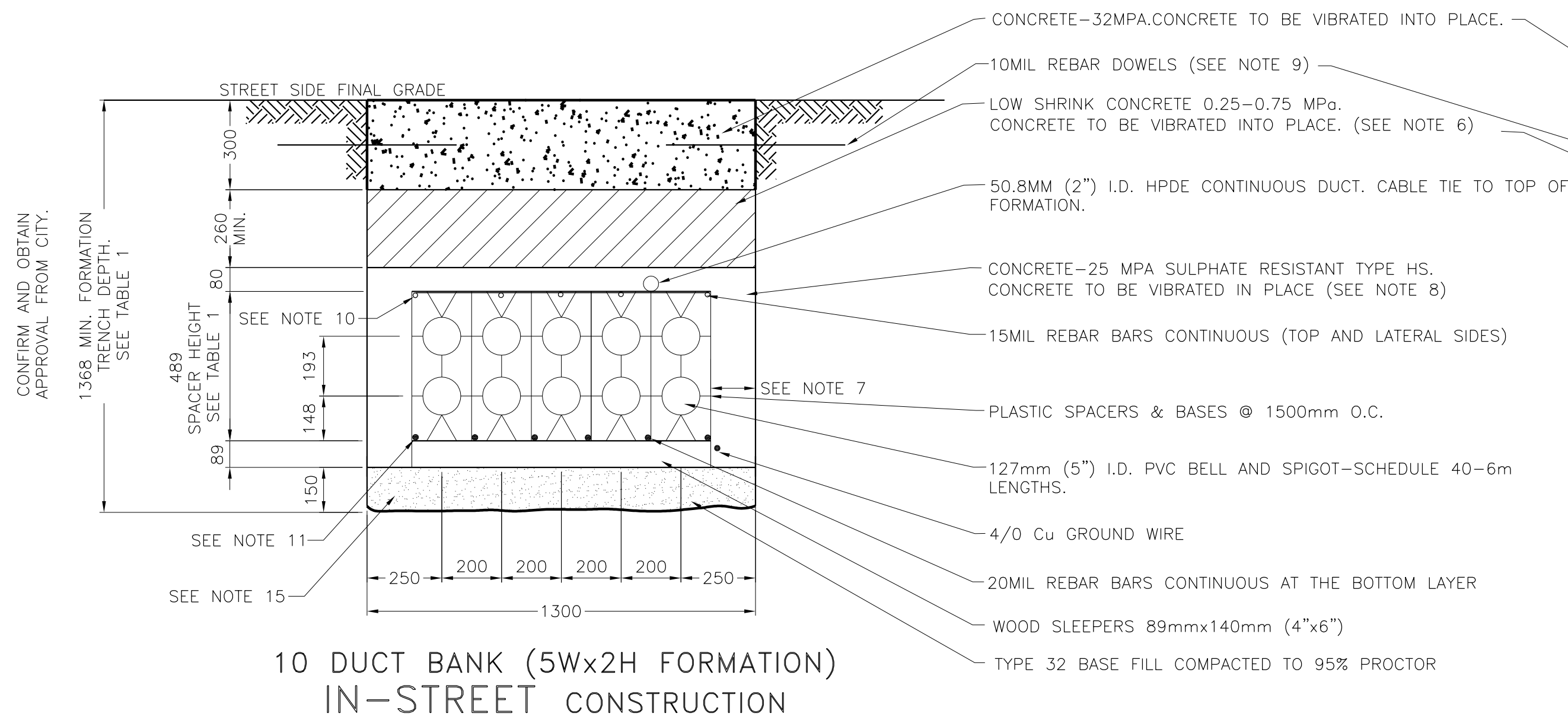


DUCT BANK CONSTRUCTION

DRAWING NUMBER	SHT.	DRAWING TITLE	DWG REV.	BOM REV.
B-14-100	1 - 1	TYPICAL DUCT BANK ARRANGEMENT AND BACKFILL IN-STREET AND IN-SIDEWALK CONSTRUCTION	B	-
B-14-101	1 - 2	TYPICAL DUCT BANK FORMATIONS	A/A	-
B-14-102	1 - 1	TYPICAL MANHOLE VAULT AND DUCT BANK TIE-IN DETAILS	A	-
B-14-103	1 - 1	MANHOLE VAULT BACKFILL IN-STREET AND IN-SIDEWALK CONSTRUCTION	A	-
B-14-104	1 - 1	127mm CONDUIT SWEEP 30° / 45° / 90°	A	-

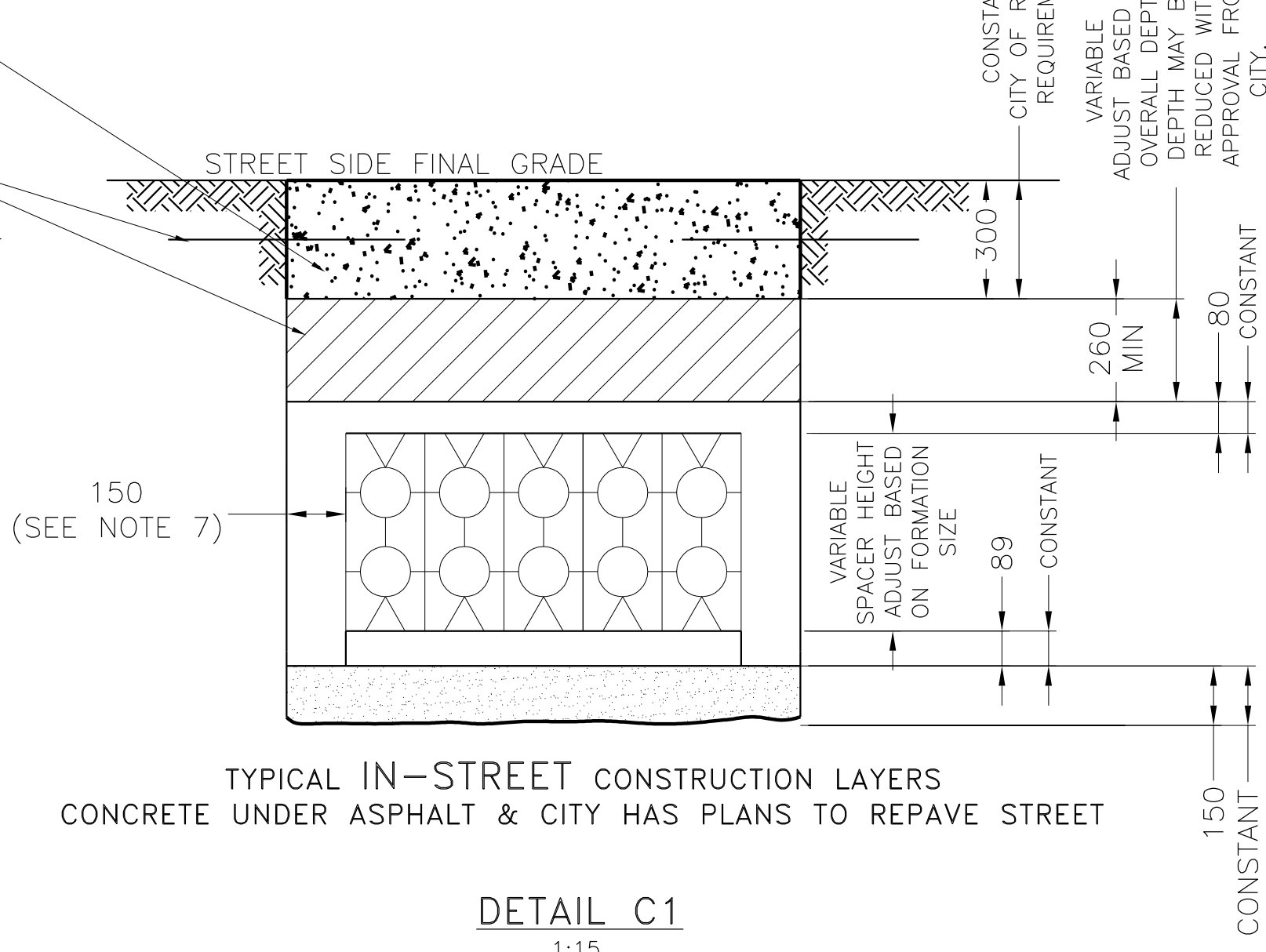
SaskPower - DISTRIBUTION STANDARDS

APPROVAL L MOEN	DESIGN CHK P PATEL	DRN. PP CHKD. LM 2022-01-06	INDEX
DATE OF ISSUE: 2022-01-10		DRAWING NO: B-14-100-INDEX	SHEET 1 of 1 REV. C



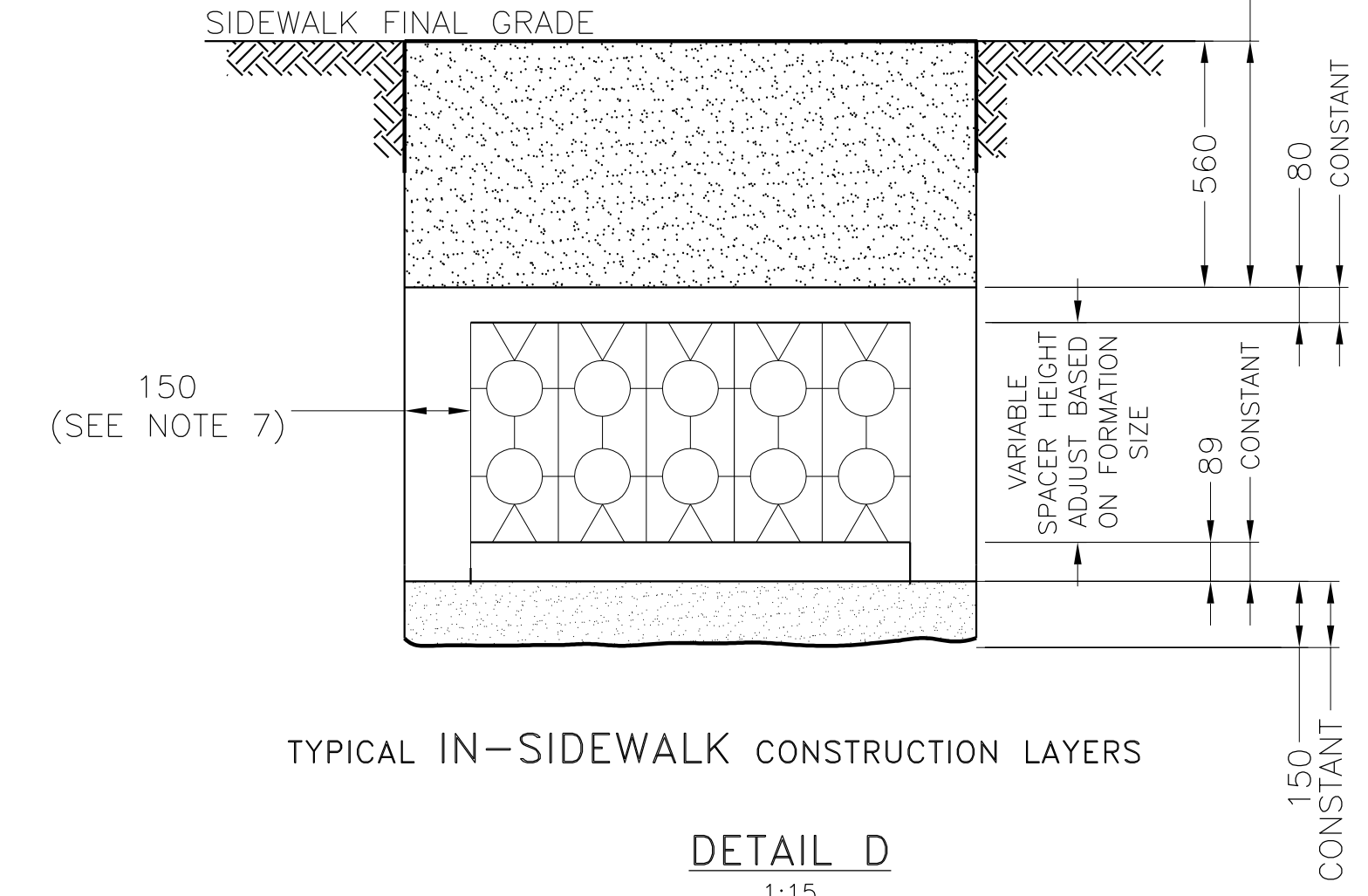
10 DUCT BANK (5Wx2H FORMATION)
IN-STREET CONSTRUCTION

DETAIL A
1:15



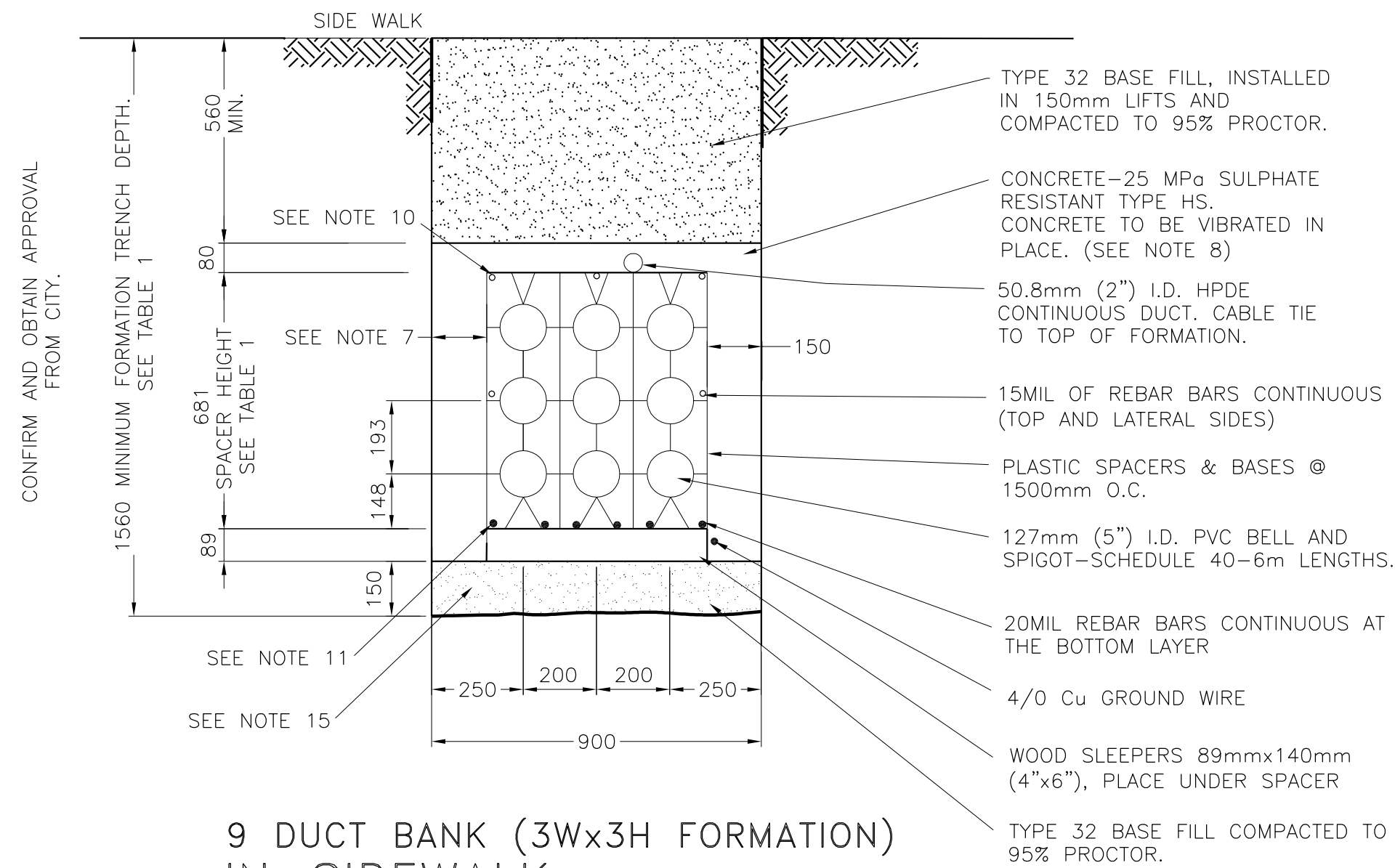
TYPICAL IN-STREET CONSTRUCTION LAYERS
CONCRETE UNDER ASPHALT & CITY HAS PLANS TO REPAVE STREET

DETAIL C1
1:15



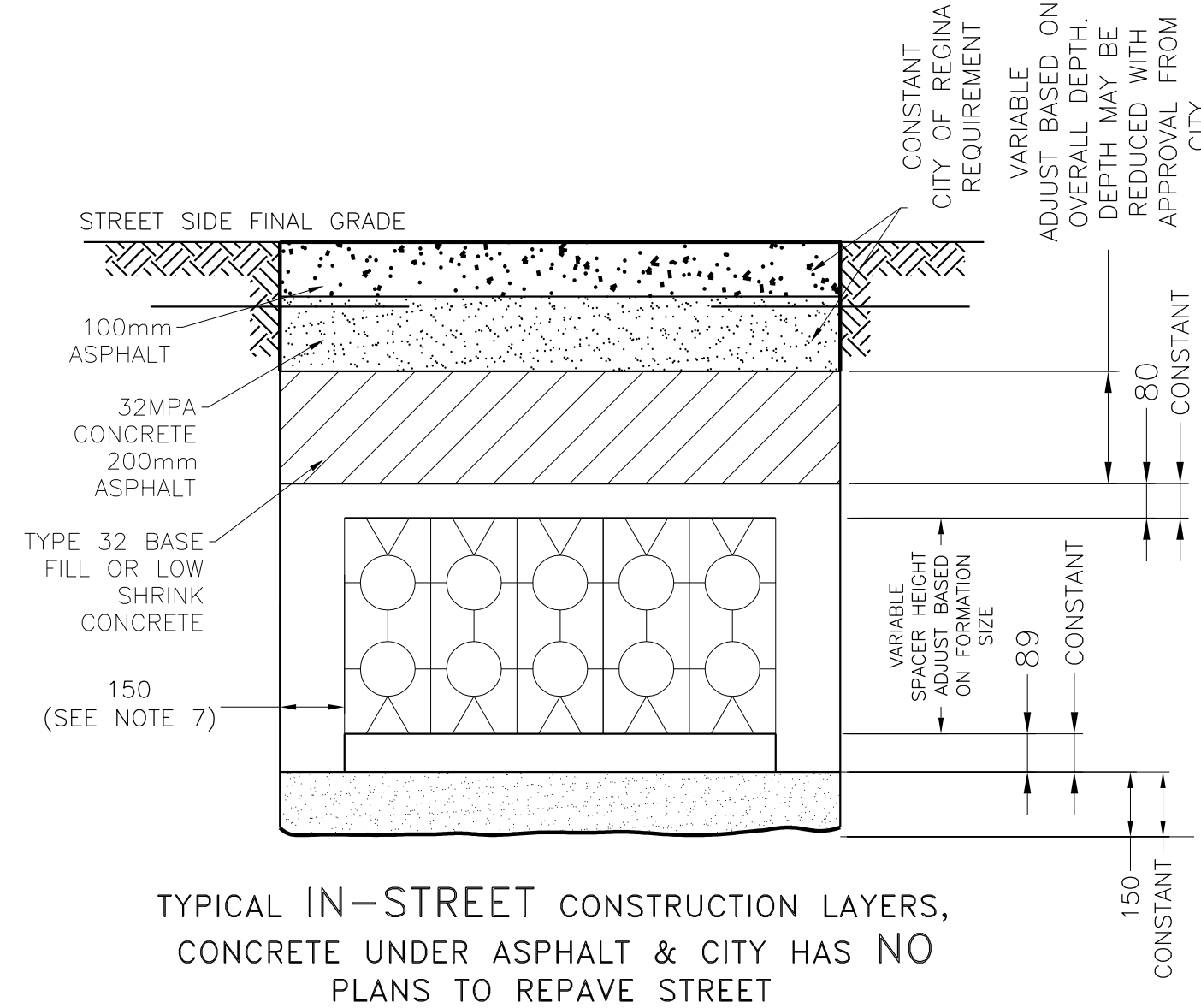
TYPICAL IN-SIDEWALK CONSTRUCTION LAYERS

DETAIL D
1:15



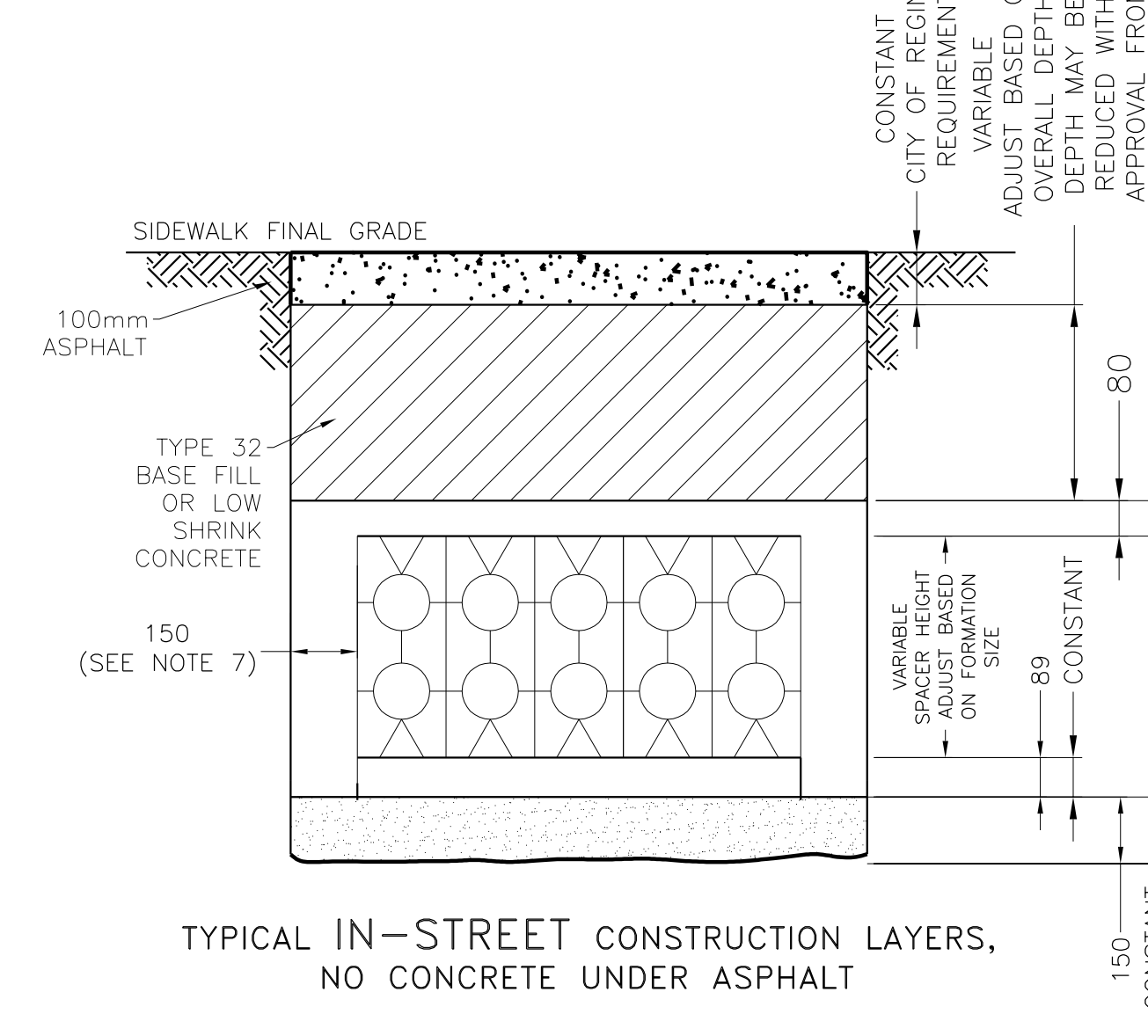
9 DUCT BANK (3Wx3H FORMATION)
IN-SIDEWALK CONSTRUCTION

DETAIL B
1:15



TYPICAL IN-STREET CONSTRUCTION LAYERS,
CONCRETE UNDER ASPHALT & CITY HAS NO
PLANS TO REPAVE STREET

DETAIL C2
1:15



TYPICAL IN-STREET CONSTRUCTION LAYERS,
NO CONCRETE UNDER ASPHALT

DETAIL C3
1:15

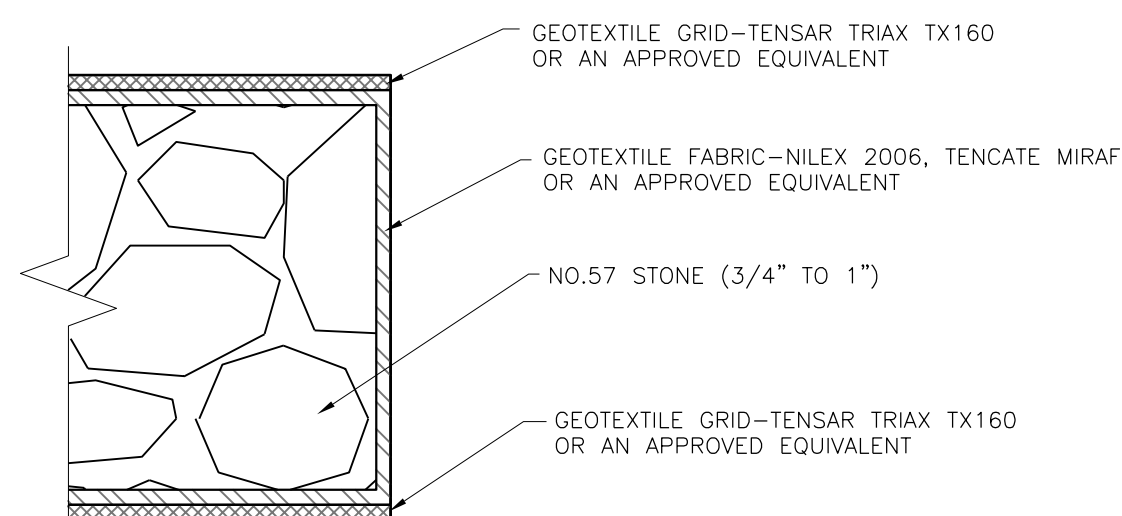
REFERENCE:

1. THE CONCRETE CONSTRUCTION DEPENDS ON THE WEATHER REFER TO "COLD WEATHER CONCRETING REQUIREMENTS FOR BURIED CONCRETE CABLE DUCT BANKS", OR "DUCT BANK AND MANHOLE VAULT WARM WEATHER CONSTRUCTION REQUIREMENTS AND SPECIFICATIONS".
2. THE DUCT BANK FORMATIONS AND DIMENSIONS ARE REFERENCED TO DRAWINGS "TYPICAL DUCT BANK FORMATIONS", SHEET 1 OF 2 AND SHEET 2 OF 2.

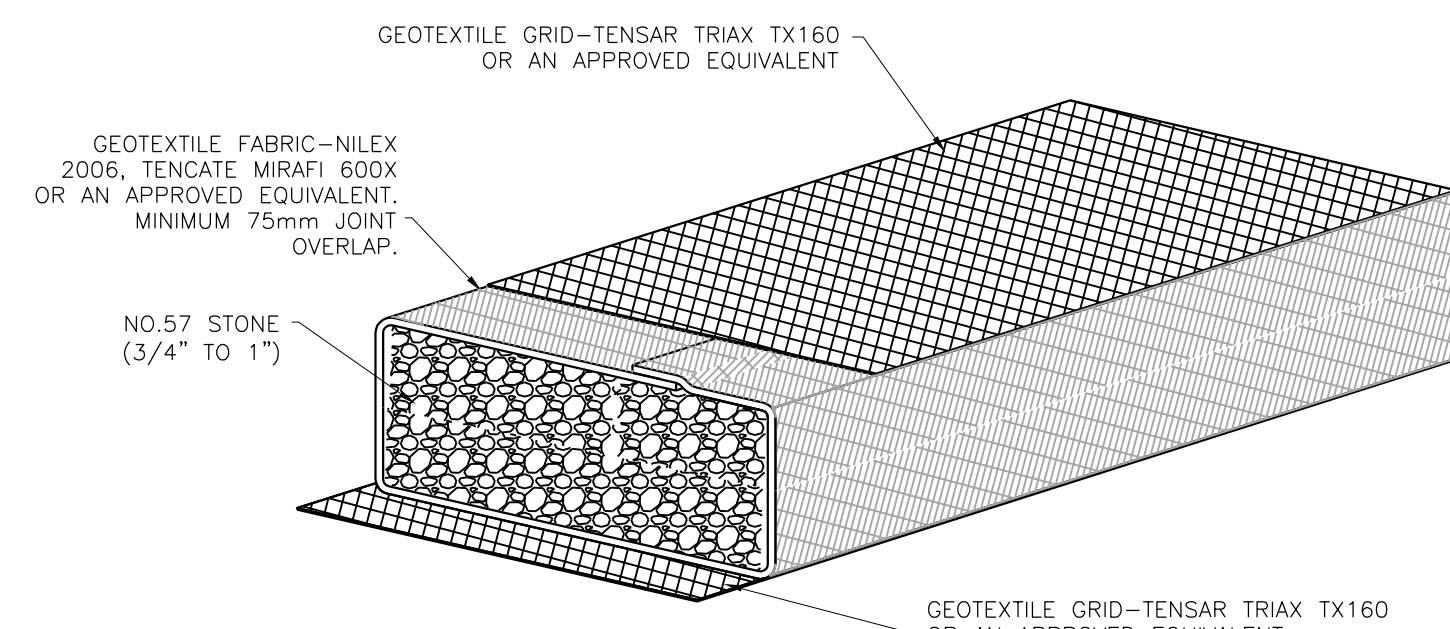
NOTES:

1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.
2. CONCRETE TO BE MINIMUM 25 MPa, FROM AN APPROVED READY MIX CONCRETE SUPPLIER, AND COMPLY WITH ALL THE LATEST CSA STANDARDS FOR QUALITY, WORKMANSHIP, STORAGE, HANDLING WEATHER REQUIREMENTS MIXTURES, AND TESTING.
3. REINFORCING TO CONFORM TO CSA STANDARD G30.18-M92, F_y=400MPa
4. REBAR TO BE FASTENED TO SPACERS WITH WIRE TIES SUPPLIED BY CONTRACTOR.
5. ALL DUCT BANKS TO BE SURVEYED EVERY 10 METERS AT EDGES & CENTER LINE BEFORE BACKFILL INSTALLED.
6. SASKPOWER MAY SPECIFY TYPE 32 BASE FILL BE USED RATHER THAN LOW SHRINK CONCRETE IF TEMPERATURES ARE A FACTOR. BASE FILL WOULD NEED TO BE INSTALLED IN 150mm LIFTS AND TAMPED TO 95% PROCTOR.
7. THE 150mm FROM THE OUTSIDE OF THE CONDUIT SPACER TO THE EDGE OF THE TRENCH INCLUDES ROOM FOR SHORING IF REQUIRED. AN ABSOLUTE MINIMUM OF 75mm OF CONCRETE IS REQUIRED TO EXTEND HORIZONTALLY FROM THE OUTER EDGE OF THE CONDUIT SPACER. ANY VALUE LESS THAN THIS NEEDS TO BE APPROVED BY ENGINEERING.
8. WHEN NECESSARY, A PUMPER TRUCK OR OTHER SUFFICIENT MEANS IS TO BE USED TO ENSURE CONCRETE IS NOT DROPPED INTO PLACE FROM LARGE HEIGHTS. DROPPING CONCRETE INTO PLACE CAN CAUSE AGGREGATE SEPARATION OR DAMAGE TO DUCT BANK.
9. AT COLD JOINTS BETWEEN EXISTING AND NEW CONCRETE OR WHEN CONSTRUCTION JOINTS ARE ALLOWED, 10MIL STEEL DOWELS, 600MM LONG, SHALL BE PLACED AT 1.0 METER INTERVALS AS PER CITY OF REGINA STANDARD CONSTRUCTION SPECIFICATION SECTION 2240.
10. REBAR TO BE LASHED TO SPACERS AS CLOSE TO TOP OF SPACER AS POSSIBLE, AWAY FROM CONDUITS.
11. REBAR AT THE BOTTOM LAYER TO BE LASHED TO SPACERS THROUGH THE SPACE PROVIDED.
12. REINFORCING TO CONFORM TO CSA STANDARD G30.18-M92, F_y=400MPa.
13. DETAILS C & D ARE BASED ON THE CITY OF REGINA REQUIREMENTS. FOR LOCATIONS OUTSIDE OF THE CITY OF REGINA, THE REQUIREMENTS WILL NEED TO BE IDENTIFIED BY ENGINEERING.
14. IF THE DUCT BANK WILL BE BUILT OUTSIDE OF THE CITY OF REGINA, CONFIRM MINIMUM TRENCH DEPTH OF THE FORMATION AND BACK FILL REQUIREMENT WITH LOCAL MUNICIPALITY.
15. IN LOCATIONS WHERE COMPACTING IS RESTRICTED AND WITH ENGINEERS APPROVAL, THE TYPE 32 BASE FILL CAN BE REPLACED WITH #57 STONE COMPLETELY ENCLOSED BY FILTRATION FABRIC AND GEOTECH FABRIC. SEE DETAIL "E" AND "F".

- #57 STONE SIEVE SIZE REQUIREMENT:
 -PERCENT PASSING 1 1/2 INCHES (38mm) 100%
 -PERCENT PASSING 1 INCH (25mm) 95% TO 100%
 -PERCENT PASSING 3/4 INCH (19mm) 0% TO 15%



ALTERNATIVE BASE FILL SECTION
DETAIL E
NTS



ALTERNATIVE BASE FILL
DETAIL F
NTS

TABLE 1 (MINIMUM TRENCH DEPTH)		
WxH	SPACER HEIGHT (mm)	MIN TRENCH DEPTH OF FORMATION (mm)
2x2	489	1368
3x2	489	1368
4x2	489	1368
5x2	489	1368
6x2	489	1368
8x2	489	1368
2x3	681	1560
3x3	681	1560
4x3	681	1560
5x3	681	1560
2x4	873	1752
3x4	873	1752
4x4	873	1752

* CONFIRM MINIMUM TRENCH DEPTHS OF THE FORMATION, AND OBTAIN APPROVAL FROM THE CITY (PROJECT SPECIFIC).

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TYPICAL DUCT BANK ARRANGEMENT
AND BACKFILL
IN-STREET AND IN-SIDEWALK
CONSTRUCTION
DISTRIBUTION STANDARDS

AUTOCAD SOURCE FILENAME:
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DRAWING No.
B-14
100
SHEET 1 OF 1 REV. B

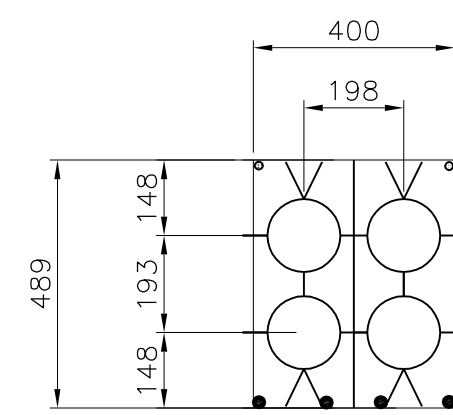
DESIGNED BY X.ZHANG
DRAWN BY D.REDEKOPP
CHECKED BY L.MOEN
SEALED BY
DATE (Y-M-D) 2016-05-10
-ADDED DETAILS C2, C3, E, F
-ADDED NOTES 13, 14, & 15

DESIGNED BY X.ZHANG
DRAWN BY T.WEISE
APPR'D BY M.ERETH
SEALED BY
DATE (Y-M-D) 2015-09-21
-MATERIALS SUPPLYING
REQUIREMENTS ARE REMOVED.

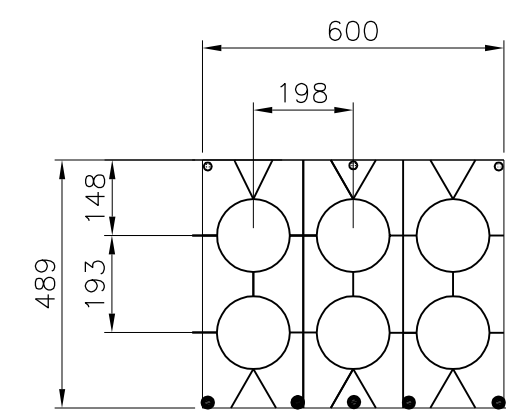
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DRAWN BY A.GATZKE
CHECKED BY
DATE (Y-M-D) 2014-12-22

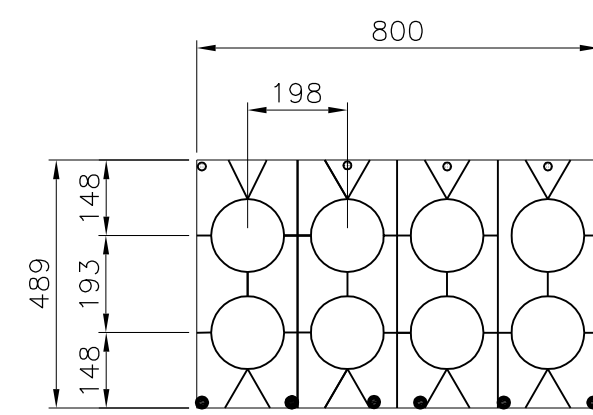
DESIGN DEPT.
DESIGNED BY J.ZHANG
CHECKED BY J.ZHANG
APPROVED BY M.ERETH
SEALED BY M.ERETH
DATE (Y-M-D)



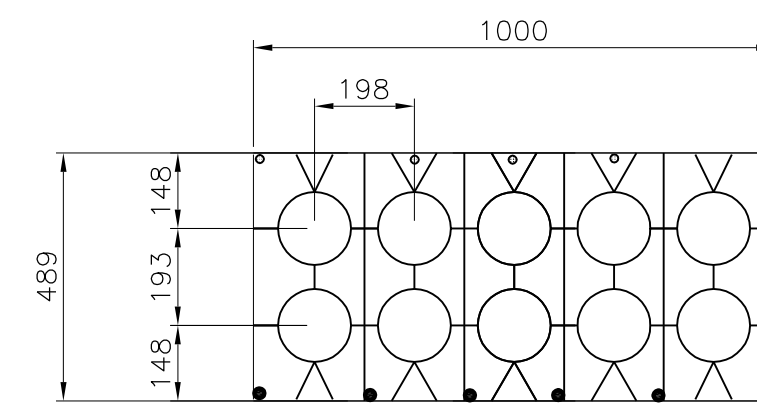
2W2H
4 DUCTS



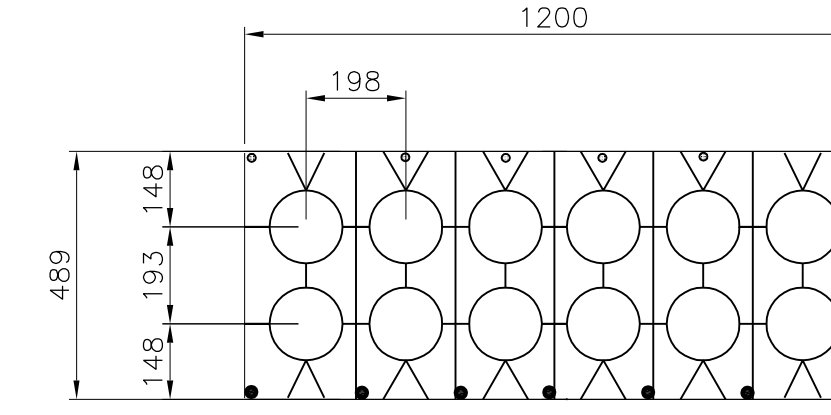
3W2H
6 DUCTS



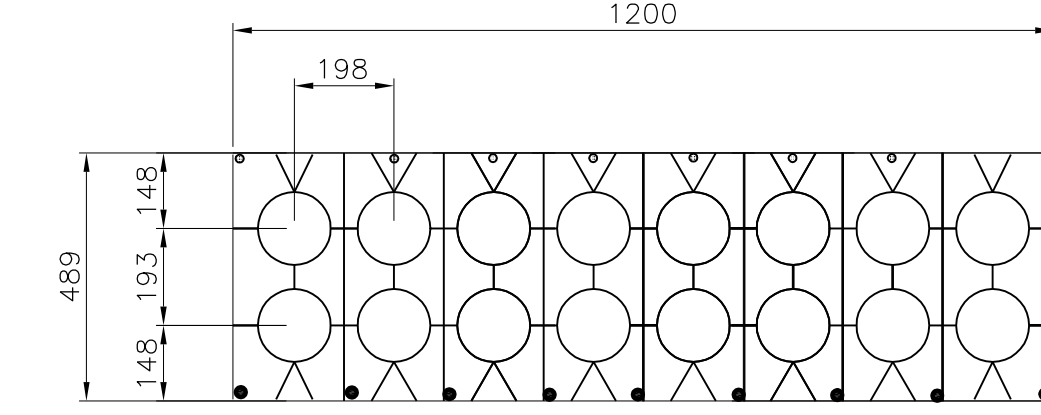
4W2H
8 DUCTS



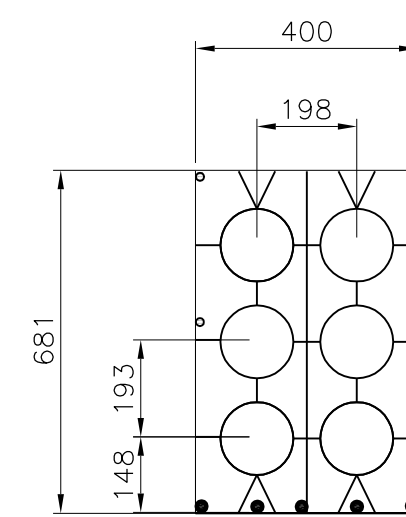
5W2H
10 DUCTS



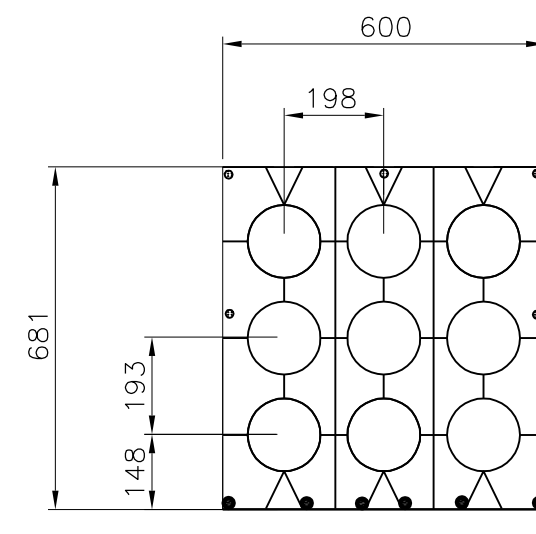
6W2H
12 DUCTS



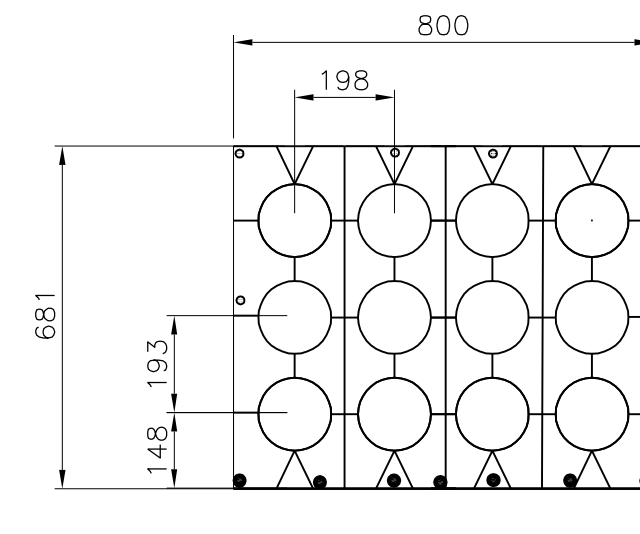
8W2H
16 DUCTS



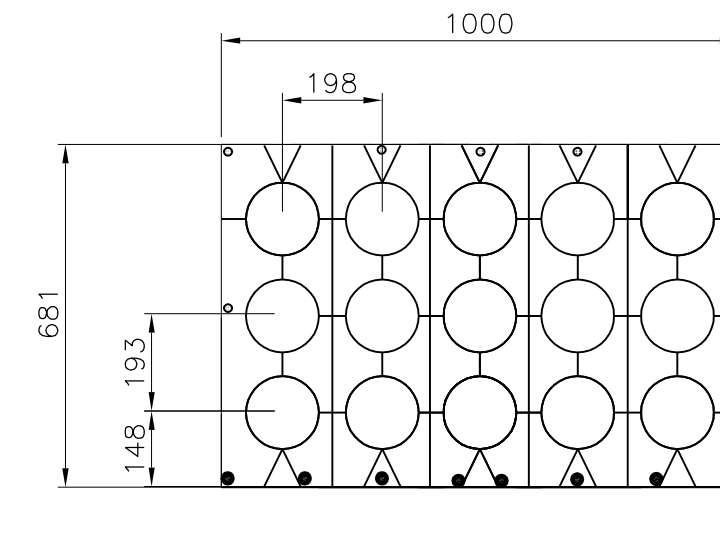
2W3H
6 DUCTS



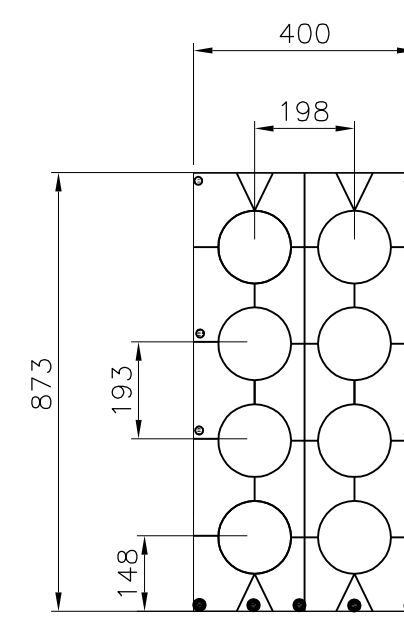
3W3H
9 DUCTS



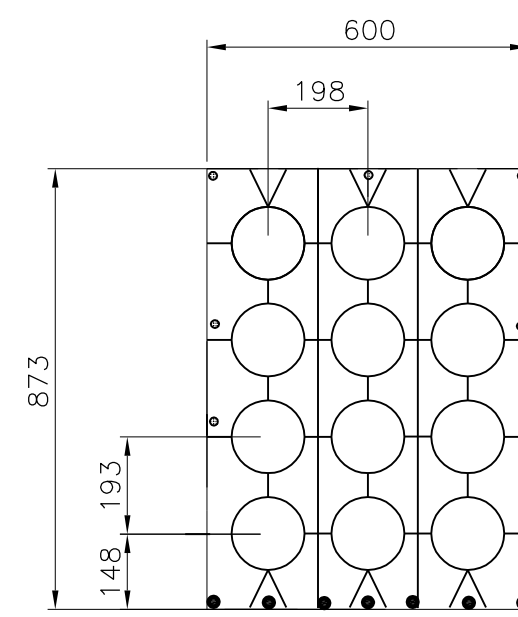
4W3H
12 DUCTS



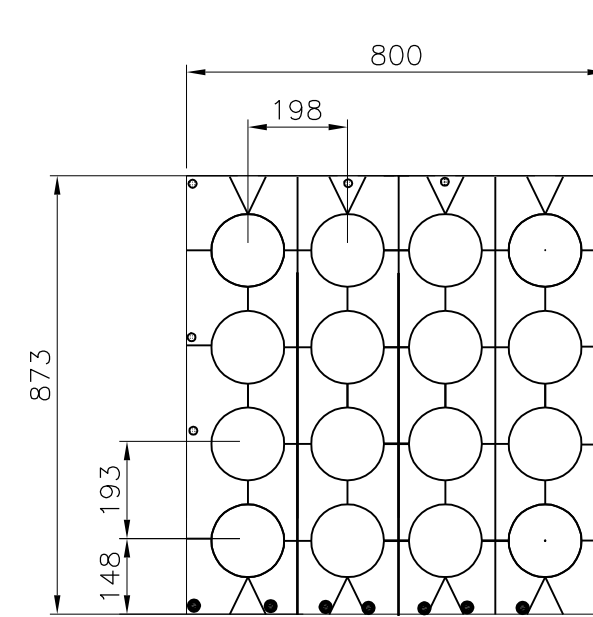
5W3H
15 DUCTS



2W4H
8 DUCTS



3W4H
12 DUCTS



4W4H
16 DUCTS

INSIDE DUCT DIAMETER (d)	127
OUTSIDE DUCT DIAMETER (D)	144

DUCTS	
NUMBER OF DUCTS WxH	WxH
2x2 (4)	400x489
3x2 (6)	600x489
4x2 (8)	800x489
5x2 (10)	1000x489
6x2 (12)	1200x489
8x2 (2)	1600x489
2x3 (6)	400x681
3x3 (9)	600x681
4x3 (12)	800x681
5x3 (15)	1000x681
2x4 (8)	400x873
3x4 (12)	600x873
4x4 (16)	800x873

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
- A CONCRETE ENCASED DUCT IS TO BE DENOTED BY ITS MATRIX.
EX) 3 ROWS AND 4 COLUMN DUCT ARRANGEMENT WILL BE 3W4H.

MINIMUM TENSILE REINFORCEMENT:

(BOTTOM LAYER REBAR)

$$A_s(\min) = (0.2 \times (f_c)^{0.5}) / (f_y) \times (b \times h - A(\text{duct}))$$

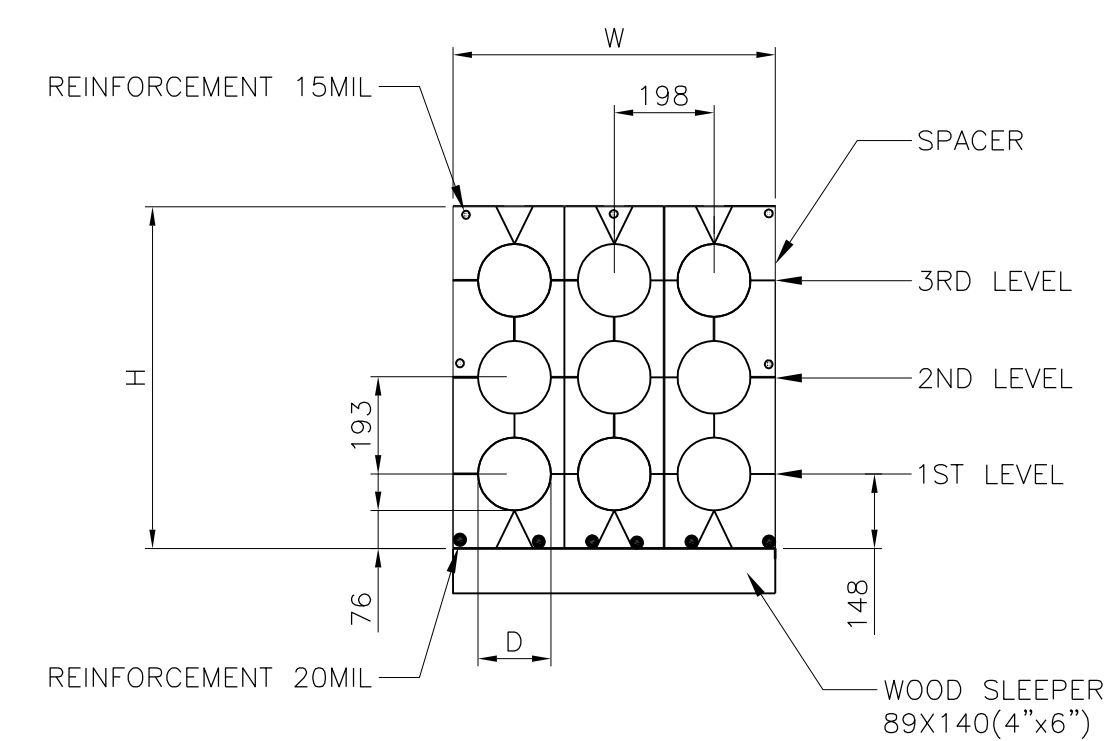
WHERE:

$A_s(\min)$: MINIMUM AREA OF TENSILE REINFORCEMENT
 f_c : CONCRETE STRENGTH (MPa)
 f_y : STEEL STRENGTH (MPa)
 b: WIDTH OF DUCT BANK
 h: HEIGHT OF DUCT BANK
 $A(\text{duct})$: THE EMPTY DUCT AREA

$$W = 200 + (n-1) \times 198$$

$$H = 300 + (N-1) \times 193$$

W: WIDTH OF ENTIRE SPACER
 H: HEIGHT OF ENTIRE SPACER
 n: NUMBER OF CONDUIT IN WIDTH
 N: NUMBER OF CONDUIT IN HEIGHT



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TYPICAL DUCT BANK FORMATIONS
 DISTRIBUTION STANDARDS

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 DRAWING No.
B-14
 101
 SHEET 1 OF 2 REV. A

DESIGNED BY X.ZHANG
 DRAWN BY A.GATZKE
 CHECKED BY
 APPR'D BY D.REDEKOPP
 SEALED BY L.MOEN
 DATE (Y-M-D) 2016-05-11

ENGINEERING SEAL.

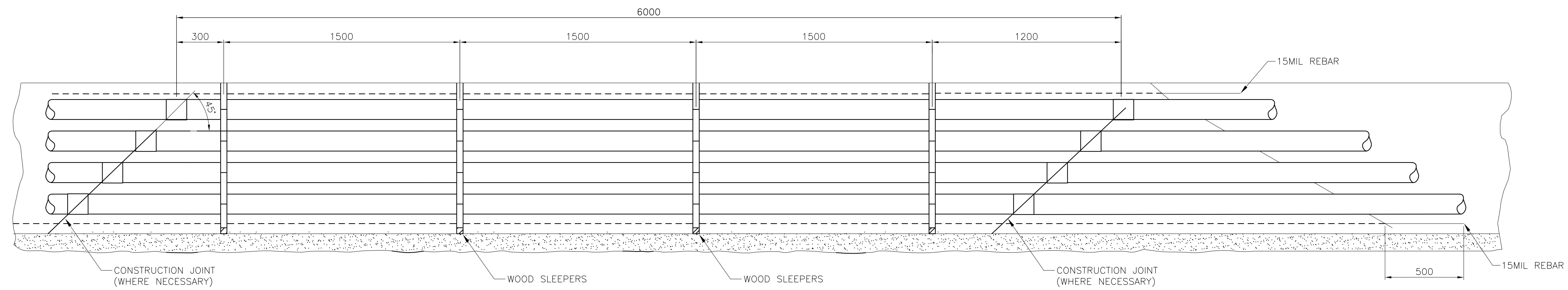
DRAFTING DEPT.
 DATE (Y-M-D) 2014-12-22

DESIGN DEPT.
 DESIGNED BY X.ZHANG
 CHECKED BY X.ZHANG
 APPROVED BY M.ERETH
 SEALED BY M.ERETH
 DATE (Y-M-D)

-ADDED 4Wx2H DUCT BANK

DUCT BANK FORMATION AND MANHOLE VAULT BILL OF MATERIALS		
MATERIAL LIST	STOCK CODE NUMBER	NOTES
VAULT CONCRETE CABLE IN-STREET 7'x12' 3 PIECE UNIT	50668	
VAULT CONCRETE CABLE IN-STREET 8'x12' 4 PIECE UNIT WITH 2 PIECE WALL	50666	
305mm (12") STANDARD CONCRETE TRANSITION RING (RISER) FOR MANHOLE VAULTS	SUPPLIED WITH VAULT	
CAST IRON FRAME AND COVER	SUPPLIED WITH VAULT	
CAST IRON FRAME AND COVER GRADING RINGS	NON STOCK CODE	ORDER FROM CAST IRON FRAME AND COVER SUPPLIER
150mm (6") MODIFIED CONCRETE TRANSITION RING (COLLAR) FOR MANHOLE VAULTS		1 UNIT SUPPLIED WITH VAULT
230mm (9") MODIFIED CONCRETE TRANSITION RING (COLLAR) FOR MANHOLE VAULTS		1 UNIT SUPPLIED WITH VAULT
WIRE CU 4/0 19 STR MHD BARE	29801	
3/4" x 10" SECTIONAL GROUND ROD - COPPER BONDED	26022	
SECTIONAL GROUND ROD COUPLER - COPPER	21002	
CONNECTOR-CU COMP - 4/0 TO 3/4" ROD	51250	
5" CONDUIT PVC BELL AND SPIGOT - 20' LENGTHS - SCHEDULE 40	704505	
2" HDPE PLASTIC PIPE (CONTINUOUS CONDUIT)	708502	
SPACER BLACK PLASTIC - 5" - 2" SPACING	708245	
SPACER BLACK PLASTIC - 5" - 2" SPACING BASE	708246	
PLASTIC TIE WRAPS 11"	702911	
5" SOLID BELL END FOR PVC SCHEDULE 40 CONDUITS	704510	
20 MIL STEEL REBAR 20' LENGTHS	NON STOCK CODE	
15 MIL STEEL REBAR 20' LENGTHS	NON STOCK CODE	
10 MIL STEEL REBAR 20' LENGTHS	NON STOCK CODE	
CONDUIT PULL TAPE (2500 LBS)	713503	
5" BLANK DUCT PLUG	703159	
2" BLANK DUCT PLUG	708512	
WOOD SLEEPER 89mm x 140mm (4" x 6")	NON STOCK CODE	
HILTI - RE 500 EPOXY ADHESIVE	NON STOCK CODE	
SIKADUR 32 HI-MOD/BONDING AGENTS	NON STOCK CODE	
PRIMER FOR CONCRETE SEALANT	703147	APPLIED DIRECTLY TO THE CONDUIT, FOR PVC USE ONLY
CONCRETE SEALANT	703146	
SAND	NON STOCK CODE	
TYPE 32 BASE FILL	NON STOCK CODE	
TYPE 32 MPA CONCRETE	NON STOCK CODE	
TYPE 32 MPA CONCRETE - SULFATE RESISTANT (TYPE HS)	NON STOCK CODE	
.25 - .75 MPA LOW SHRINK CONCRETE	NON STOCK CODE	

IF TYPE 32 BASE FILL COMPACTING IS RESTRICTED AND #57 STONE IS USED FOR BASEFILL		
MATERIAL LIST	STOCK CODE NUMBER	NOTES
FILTRATION FABRIC	NON STOCK CODE	NILEX 2006, TENCATE MIRAFI 600X OR AN APPROVED EQUIVALENT
GEOTECH FABRIC	NON STOCK CODE	TEMSAR TRIAX TX160 OR AN APPROVED EQUIVALENT
#57 STONE	NON STOCK CODE	REQUIREMENT REFER TO B_14_100



HORIZONTAL VIEW 12 DUCTS BANK (3Wx4H FORMATION)
SCALE: N.T.S.

- NOTES:
- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
 - DUCTS TO BE STAGGERED AS SHOWN.
- REFERENCE:
- SECTION CUT VIEW REFER TO "TYPICAL DUCT BANK ARRANGEMENT AND BACKFILL IN-STREET AND IN-SIDEWALK CONSTRUCTION".

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TYPICAL DUCT BANK FORMATIONS

DISTRIBUTION STANDARDS

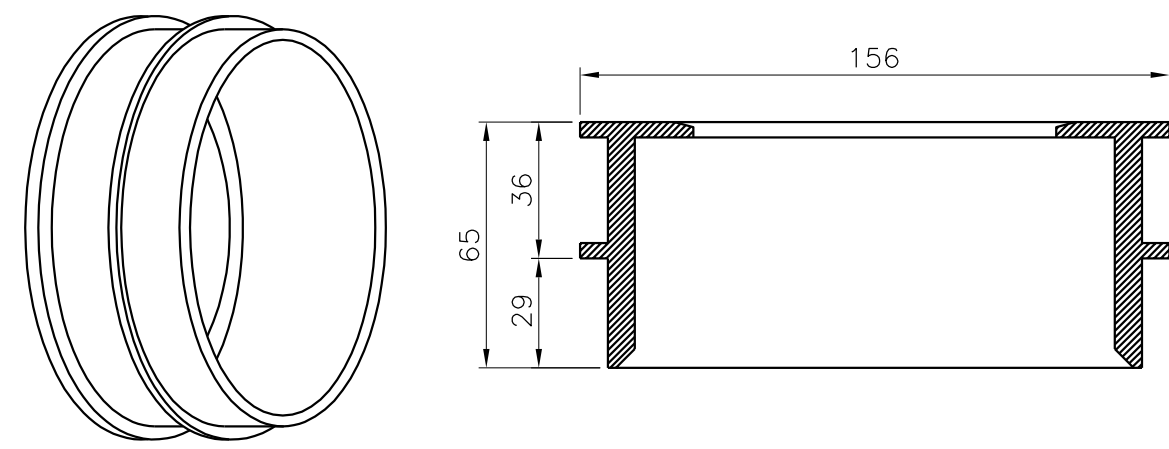
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DRAWING No.
B-14
101
SHEET 2 OF 2 REV. A

DESIGNED BY X.ZHANG
DRAWN BY D.REDEKOPP
APPR'D BY L.MOEN
SEALED BY
DATE (Y-M-D) 2016-05-11
-CHANGES TO MATERIALS LIST

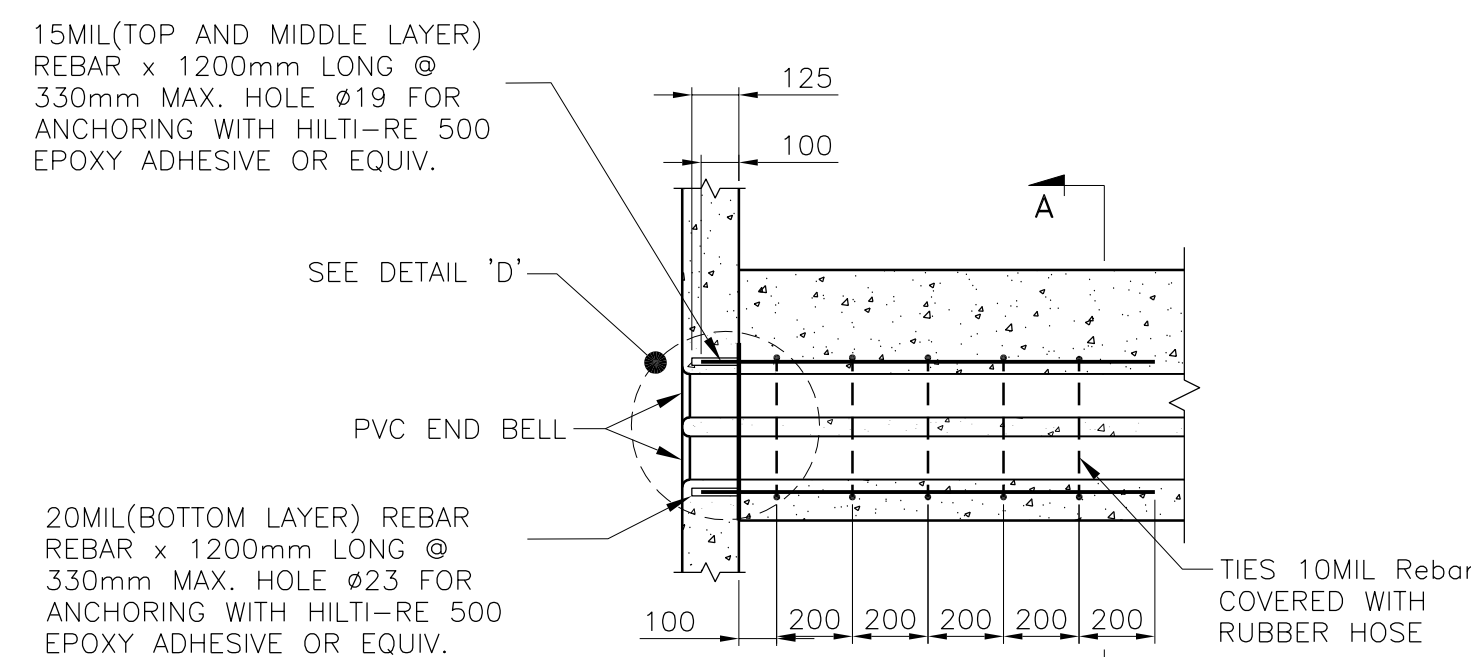
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DRAWN BY A.GATZKE
CHECKED BY
DATE (Y-M-D) 2014-12-22

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APPROVED BY M.ERETH
SEALED BY M.ERETH
DATE (Y-M-D)

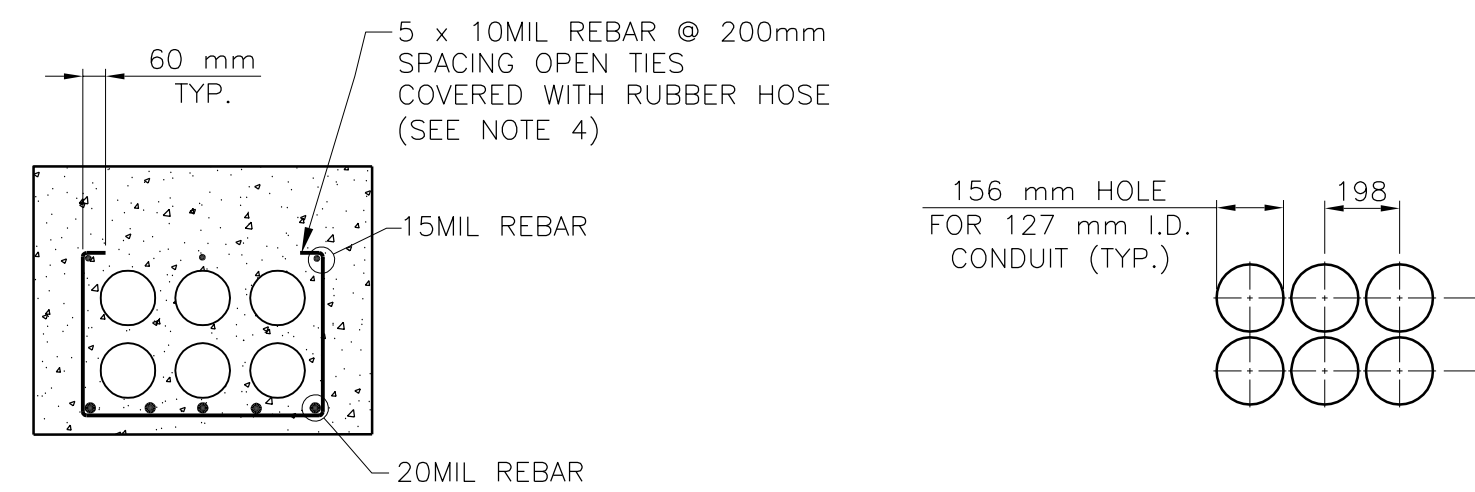


DETAIL A
SCALE: N.T.S.
(TYP. END BELLS DETAIL)

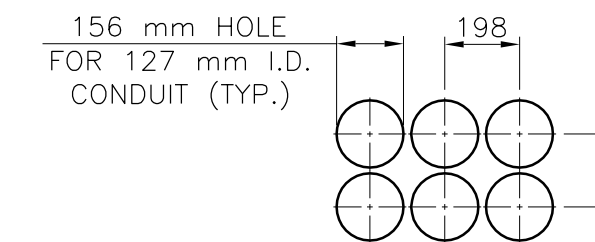


DETAIL B
SCALE: 1:20

CONNECTION OF DUCT BANK TO EXISTING CABLE VAULT (OPEN REBAR TIE'S)

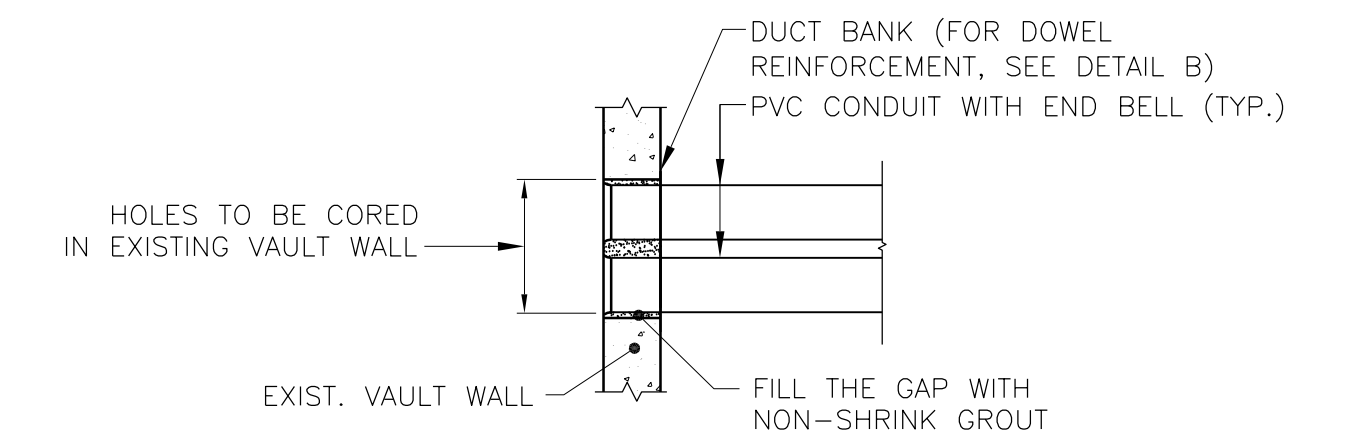


SECTION A-A
SCALE: 1:20

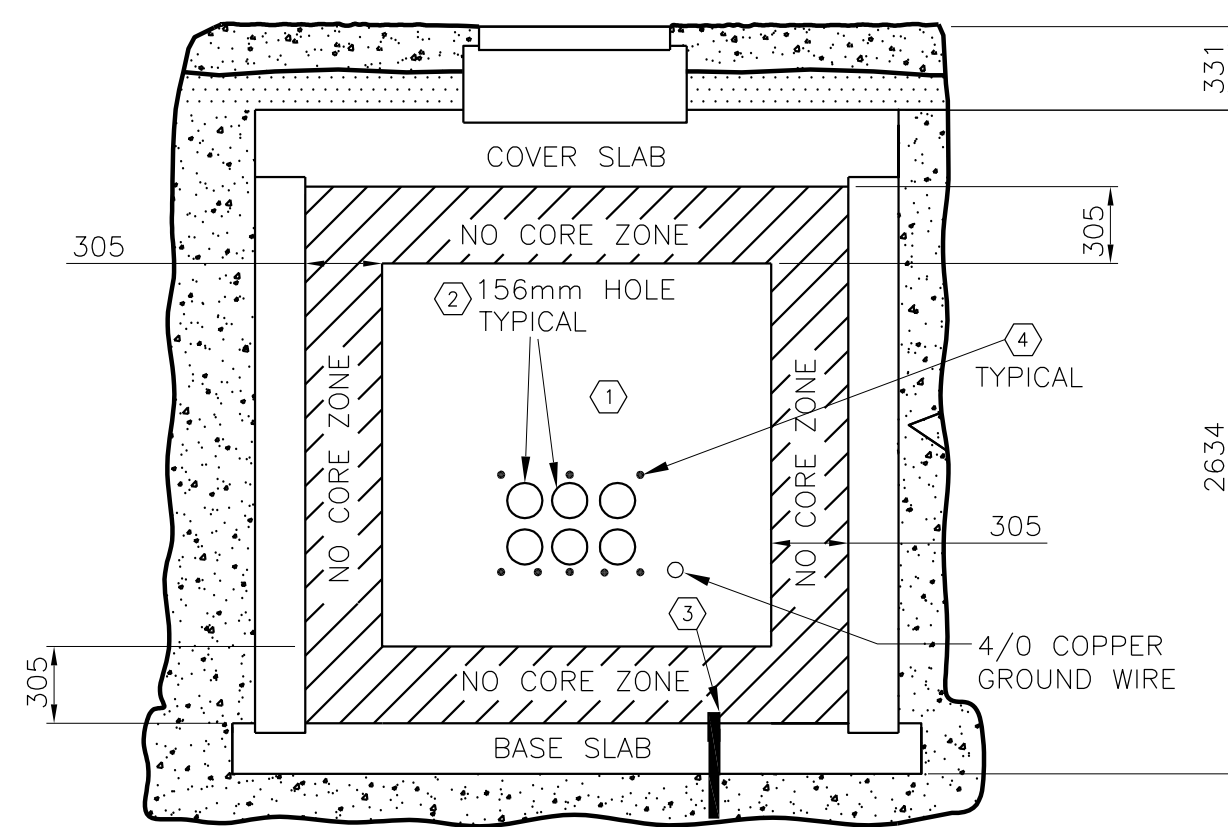


DETAIL C
SCALE: 1:20

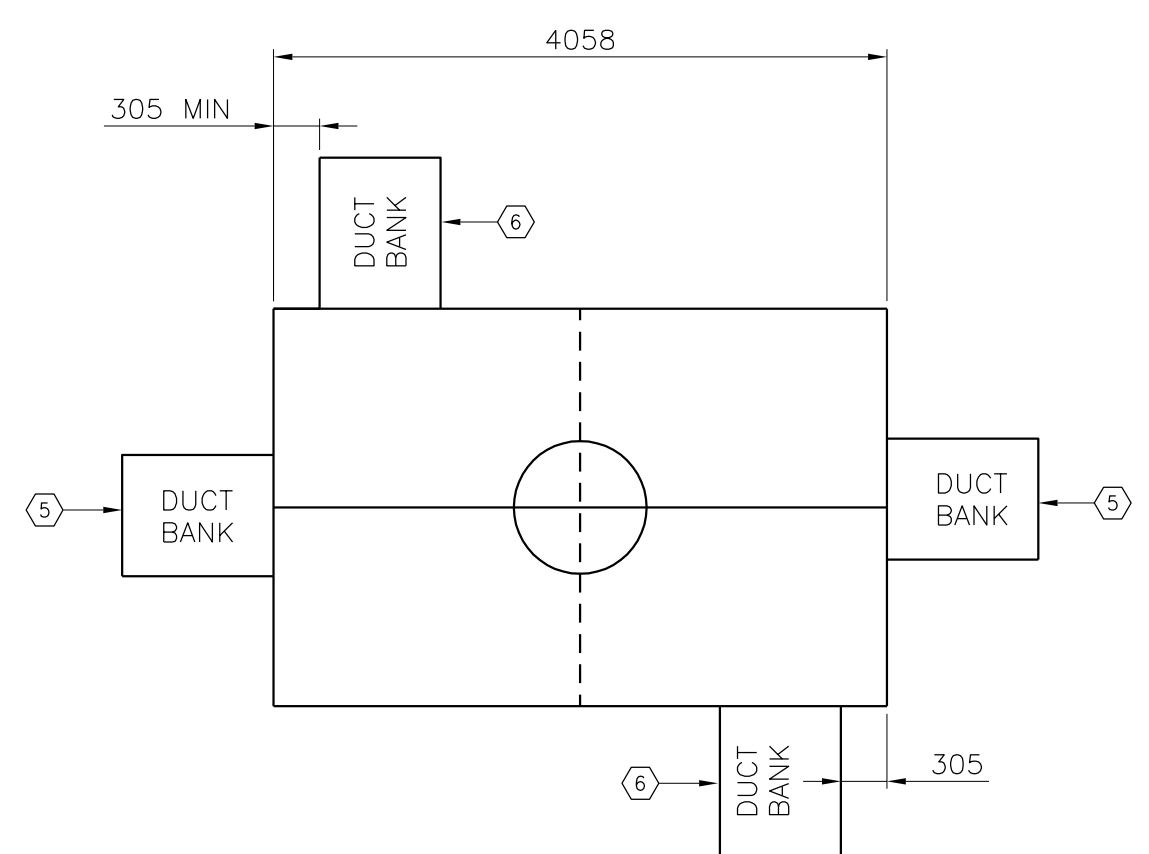
(TYPICAL SPACING FOR CORED HOLES INTO EXISTING VAULTS)



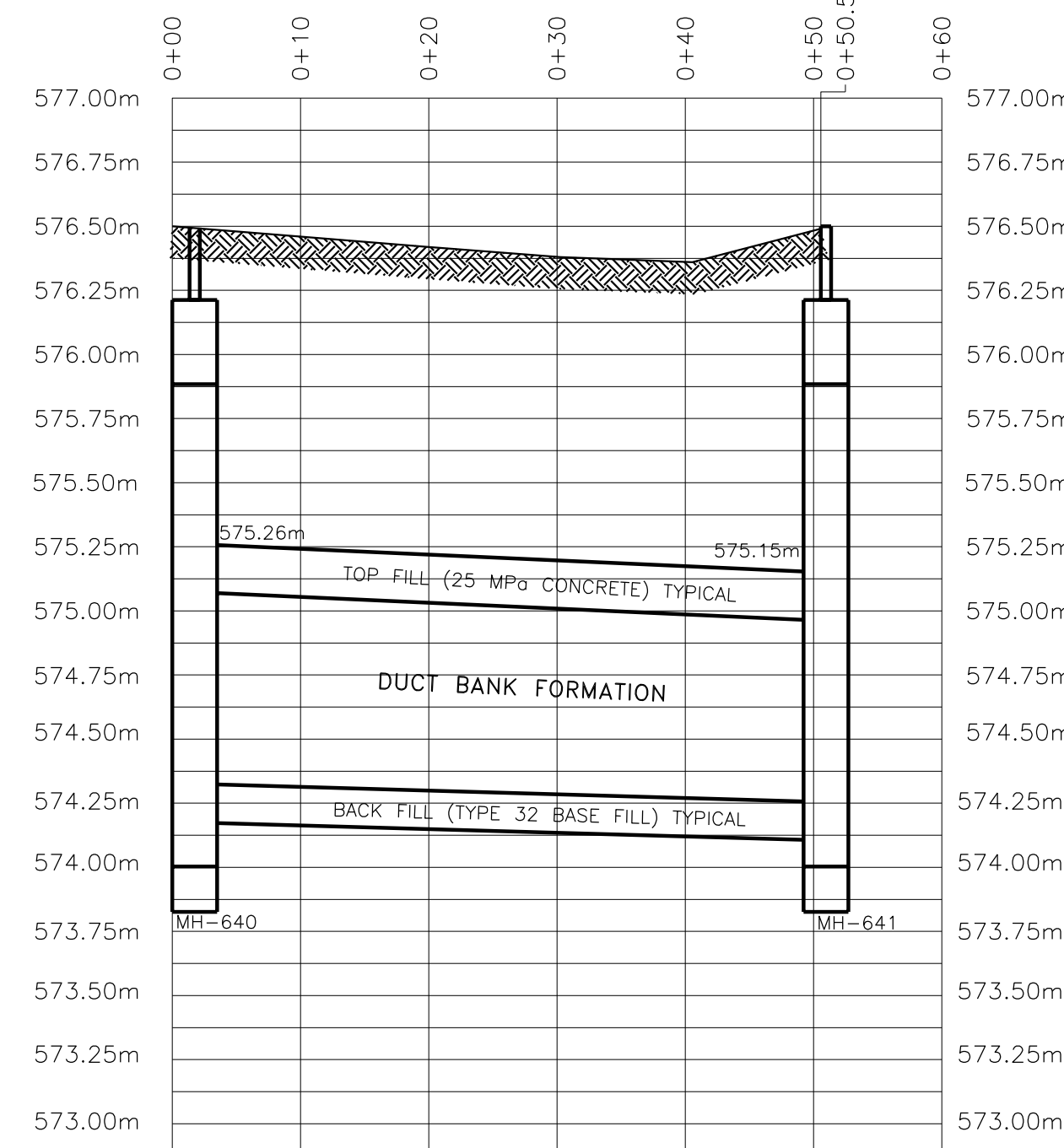
DETAIL D
SCALE: 1:20



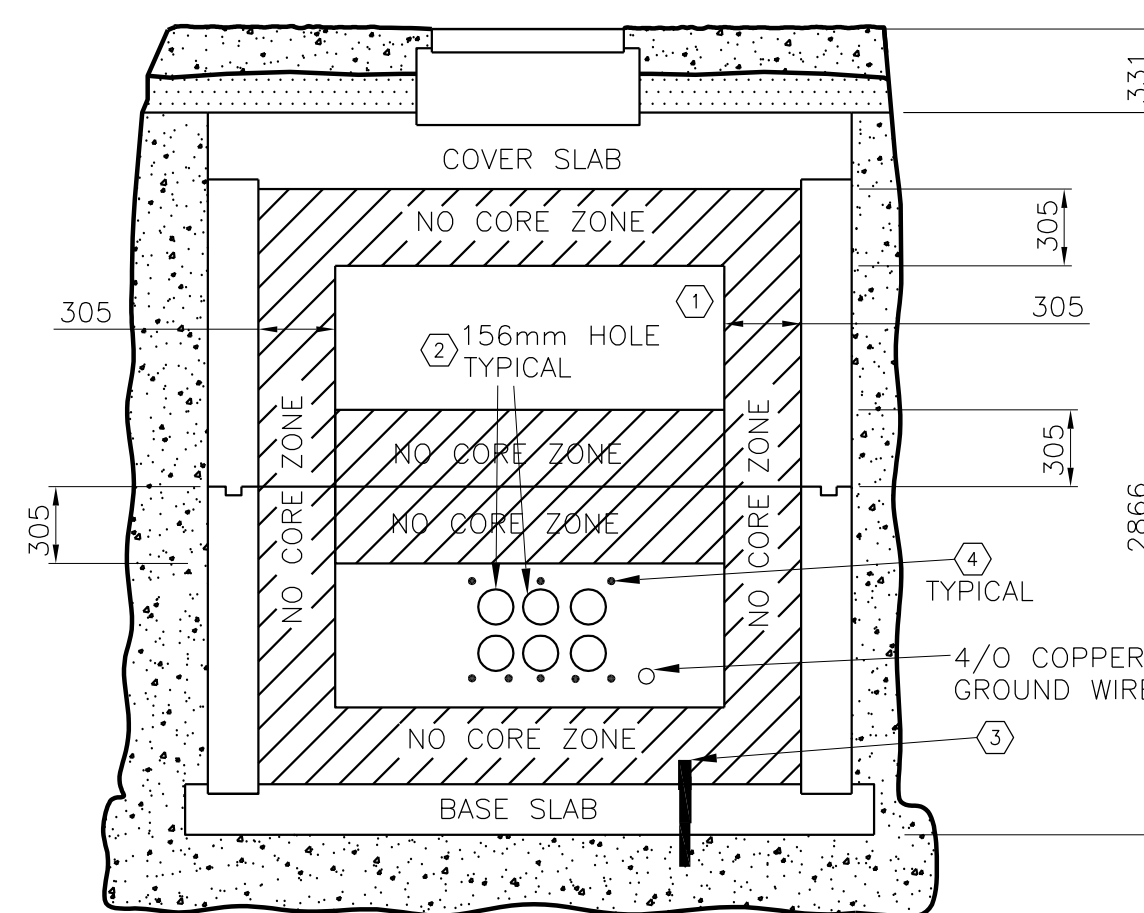
DETAIL E
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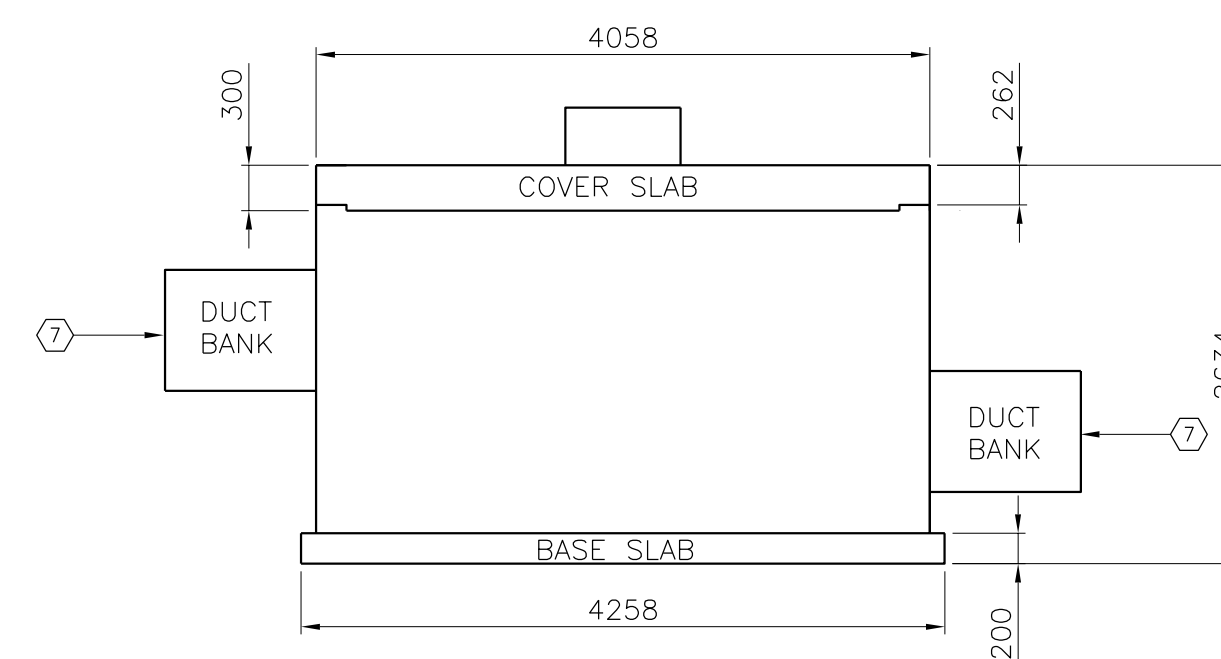
DETAIL G
SCALE: N.T.S.



DETAIL I
SCALE: N.T.S.



DETAIL F
SCALE: N.T.S.



DETAIL H
SCALE: N.T.S.

KEY NOTES:

- ① TYPICAL FORMATION OR DUCT ENTRY INTO VAULT TO BE AS FOLLOWS:
-MINIMUM 305mm FROM BOTTOM OF VAULT COVER SLAB
-MINIMUM 305mm FROM BASE SLAB
-MINIMUM 305mm FROM INSIDE EDGE OF VAULT WALLS
-MINIMUM 305mm FROM WALL JOINTS FOR VAULTS WITH A TWO PIECE WALL SECTION.
THE "NO CORE ZONE" IS APPLICABLE ONLY TO CORING CONDUITS. ENGINEERING APPROVAL TO BE OBTAINED TO CORE CONDUITS IN THE "NO CORE ZONE".
- ② DO NOT CORE THROUGH MANHOLE VAULT WALL REBAR. REFER TO MANHOLE VAULT STANDARD DRAWING FOR LOCATION OF REBAR.
-INSTALL END BELLS FOR ALL 156mm DUCT. REFER TO DETAIL "A".
-PARGE AROUND ALL CORED HOLES WITH CONCRETE SEALANT 703146. PRIMER 703147 NEEDS TO BE APPLIED TO THE CONDUITS FOR THE SEALANT, OR EQUIVALENT. (INSIDE AND OUTSIDE OF VAULT WALL). REFER TO DETAIL "D".
- ③ ALL VAULTS TO HAVE GROUND ROD INSTALLED.
-CORE Ø50mm HOLE IN BASE SLAB.
-OFFSET FROM MANHOLE ENTRY HOLE AND 102mm MAXIMUM CLEARANCE FROM VAULT WALLS.
-SEAL AROUND GROUND ROD WITH CONCRETE SEALANT.
-INSTALL 2x3m COPPER RODS (26022) AND COUPLER (21002) WITH CONNECTOR (51250).
-RUN 4/Ø COPPER AROUND INSIDE PERIMETER OF THE VAULT.
- ④ REFER TO DETAIL "B".
- ⑤ MANHOLE VAULT - NARROW WALL: DUCT BANK TO BE CENTERED WITH VAULT WALL OR OFF SET FROM EDGE OF VAULT 305mm MIN.
- ⑥ MANHOLE VAULT - LONG WALL: DUCT BANK TO BE OFF SET FROM VAULT WALL 305mm MIN. AVOID COMING IN CENTER OF WALL AS THIS WILL CAUSE ISSUES WITH PULLING LARGE SIZE CABLES THROUGH VAULT.
- ⑦ DUCT BANK SHOULD BE TIED INTO MANHOLE VAULT AT DIFFERENT ELEVATIONS, WHEN POSSIBLE, TO HELP WITH CABLE RACKING.

NOTE:

1. IF REBAR IN VAULT WALLS ARE CUT DURING CORING, THE CORED HOLE WHERE REBAR CUT IS TO BE IDENTIFIED ON AS BUILT.
2. DUCT BANK WILL HAVE A "NO TRAP" DESIGN FOR THE SLOPE, WHICH ALLOWS WATER TO DRAIN INTO VAULTS. AS A GUIDELINE, THE SLOPE SHOULD BE BETWEEN 0.67% AND 1.3% (WHICH IS IN ALIGNMENT WITH THE GOVERNMENT OF SASKATCHEWAN PLUMBING AND DRAINAGE REGULATIONS FOR MINIMUM SLOPE FOR 6" AND 4" SEWER PIPE). ENGINEERING APPROVAL REQUIRED FOR SLOPES OUTSIDE OF THESE GUIDELINES.
3. ALL MANHOLE AND DUCT BANK LOCATIONS TO BE SURVEYED IN.
4. IN THE SECTION OF CONNECTION BETWEEN DUCT BANK AND VAULTS, THE OPEN TIES SHOULD BE COMPLETELY COVERED BY RUBBER HOSE FOR ELECTRICAL ISOLATION FROM LONGITUDINAL REBAR. LEAVE EXTRA 100 mm HOSE ON THE BOTH SIDES OF THE OPEN TIES' END, FOLD THE SLEEVE BACK AND TIE IT ON THE REBAR (OPEN TIE).
5. REFER TO M2-58 SPECIFICATION FOR VAULT DETAILS.

APPROVED FOR CONSTRUCTION

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TYPICAL MANHOLE VAULT AND DUCT BANK TIE-IN DETAILS

DISTRIBUTION STANDARDS

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102
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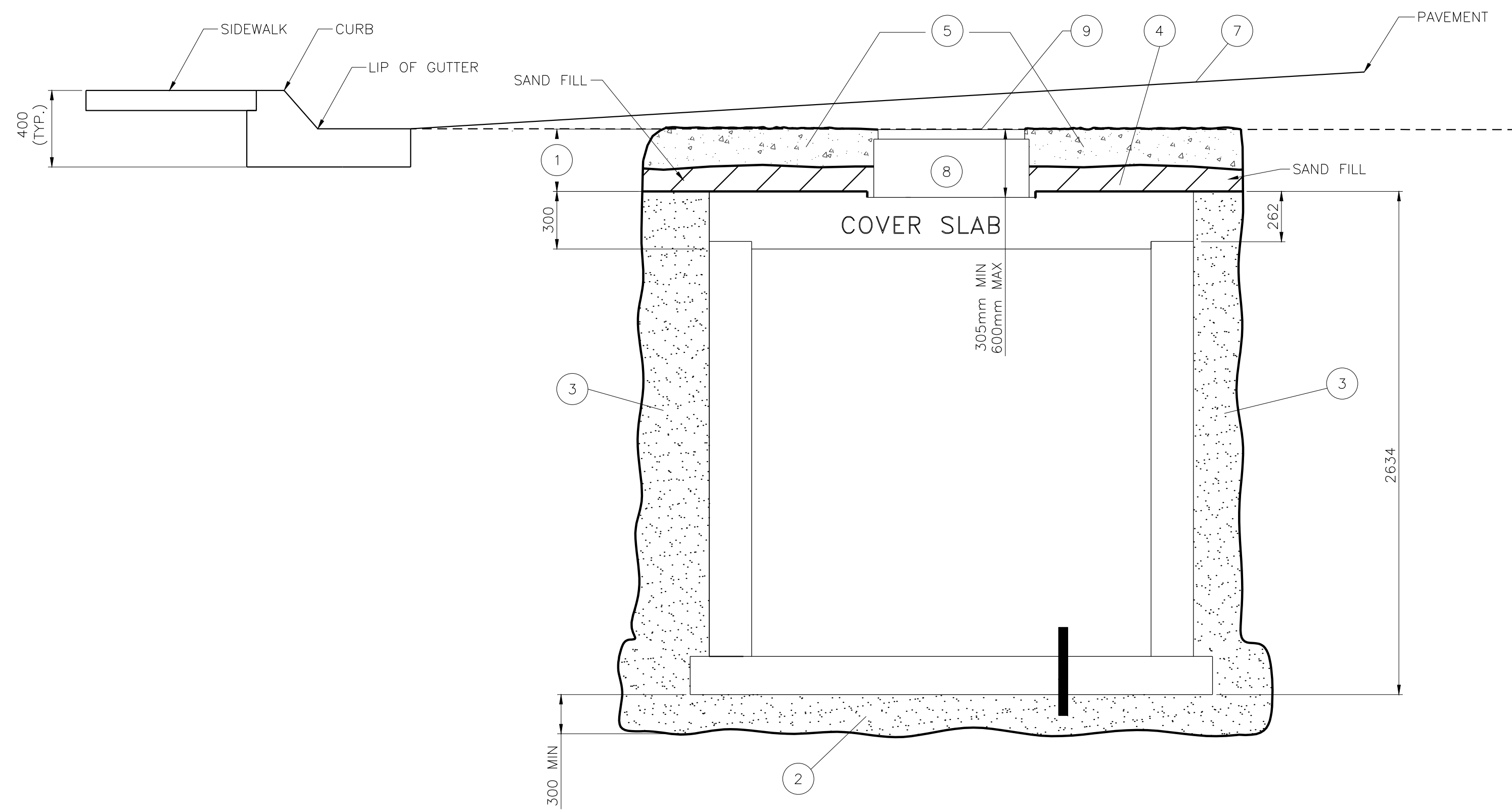
DESIGNED BY X.J.HANG
DRAWN BY D.REDEKOPP
APPR'D BY L.MOEN
SEALED BY
DATE (Y-M-D) 2016-05-11

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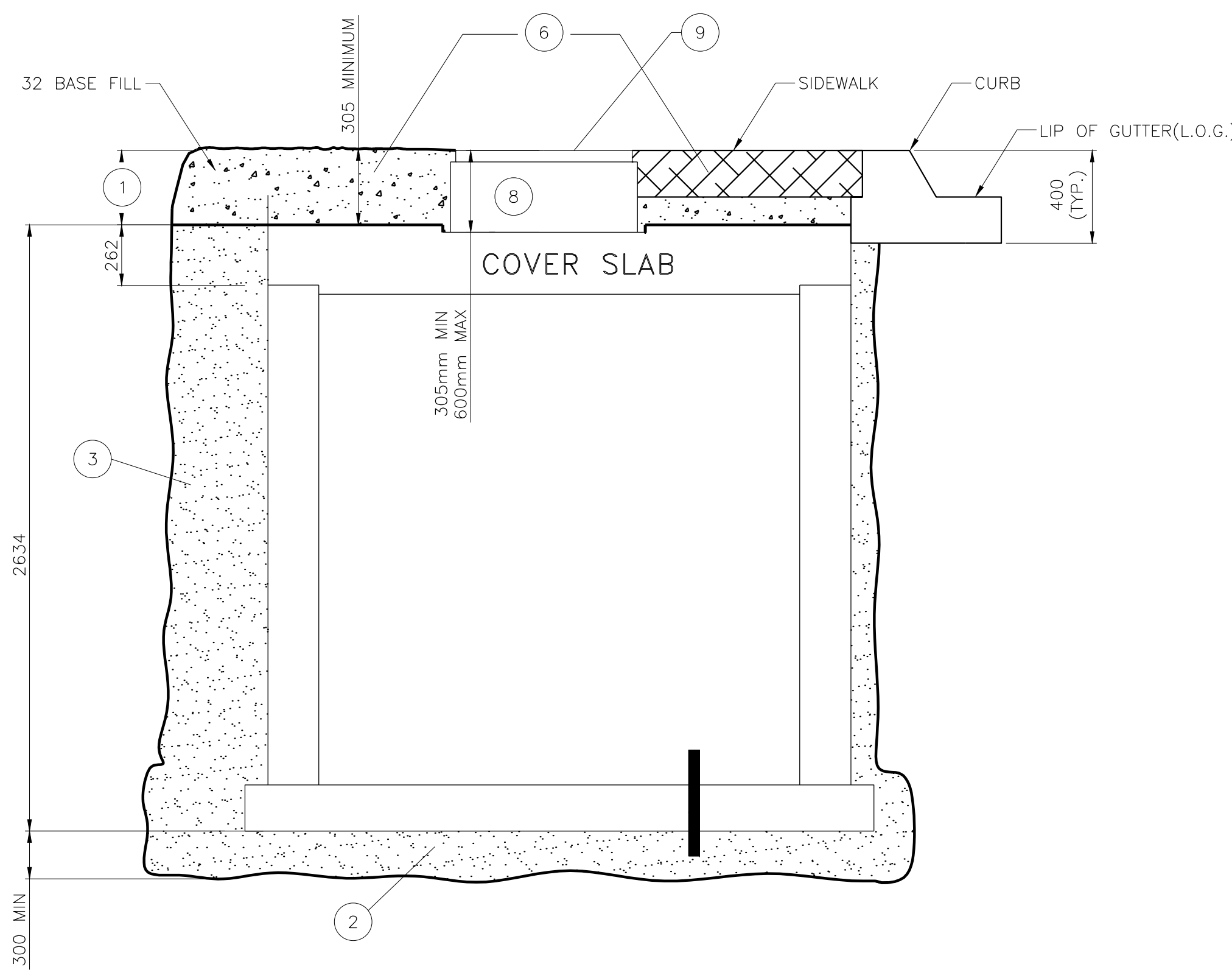
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CHECKED BY
DATE (Y-M-D) 2014-12-22

DESIGN DEPT.
DESIGNED BY X.ZHANG
CHECKED BY X.ZHANG
APPROVED BY M.ERETH
SEALED BY M.ERETH
DATE (Y-M-D)

-CHANGES TO KEY NOTES



1 PIECE WALL MANHOLE VAULT TYPICAL BACKFILL IN STREET CONSTRUCTION
DETAIL A
1:20



1 PIECE WALL MANHOLE VAULT TYPICAL BACKFILL IN SIDEWALK CONSTRUCTION
DETAIL B
1:20

KEY NOTES:

- 1 -MINIMUM DEPTH REQUIRED FROM TOP OF FINAL FILL LAYER (PAVEMENT OR BASEFILL) TO TOP OF VAULT COVER SLAB IS 305mm.
-MAXIMUM DEPTH ALLOWED FROM TOP OF FINAL FILL LAYER TO TOP OF COVER SLAB IS 600mm.
*THIS IS DUE TO VAULT CONSTRUCTION DESIGN RESTRICTIONS DEFINED BY MANUFACTURER.
*ENGINEERING TO APPROVE DEPTHS GREATER THAN 600mm.
- 2 -MAXIMUM AND MINIMUM DEPTHS INCLUDES STANDARD CONCRETE TRANSITION RING (RISER), MODIFIED CONCRETE TRANSITION RING (COLLAR) (IF REQUIRED), CAST IRON FRAME AND COVER, AND CAST IRON FRAME AND COVER GRADING RINGS (IF REQUIRED).
- 2 ALL VAULTS TO BE PLACED ON MINIMUM OF 300mm TYPE 32 BASE FILL MATERIAL - TAMPED TO 95% PROCTOR. BASE FILL TO BE INSTALLED IN MAXIMUM 150mm LIFTS.
- 3 BACKFILL AROUND VAULTS WITH TYPE 32 BASE FILL MATERIAL IN UNIFORM LAYERS NOT EXCEEDING 300mm IN THICKNESS UP TO SUBGRADE LEVEL. COMPACT EACH LAYER BEFORE PLACING SUCCEEDING LAYER. LOW SHRINK CONCRETE 0.25 TO 0.75MPa VIBRATED IN PLACE CAN ALSO BE USED.
- 4 PLACE 50mm OF SAND BETWEEN VAULT COVER SLAB AND 32MPa CONCRETE BACKFILL. TO BE USED AS A BOND BREAKER BETWEEN VAULT COVER SLAB AND CONCRETE FILL LAYER.
- 5 FOR IN-STREET CONSTRUCTION, CITY OF REGINA REQUIRES APPROXIMATELY 305mm OF 32 MPA CONCRETE COVER OVER VAULT COVER SLAB. REFER TO CITY OF REGINA CONSTRUCTION STANDARD 1390 3.5.3
- 6 FOR IN-SIDEWALK CONSTRUCTION, FINAL FILL LAYER TO GRADE TO BE TYPE 32 BASE FILL MATERIAL TAMPED TO 95% PROCTOR. CITY OF REGINA TO REPLACE SIDEWALK.
- 7 PAVEMENT FINAL GRADE TO BE DONE BY THE CITY OF REGINA. GRADING RINGS MAY BE REQUIRED TO RAISE MANHOLE ENTRY TO FINAL STREET GRADE ONCE CITY HAS REPAVED STREET. WHEN DESIGNING VAULT INSTALLATION CONSIDER SLOPE OF ROAD WAY.
- 8 STANDARD CONCRETE TRANSITION RING
- 9 CAST IRON FRAME AND COVER

NOTES:

1. ALL DIMENSION IN mm UNLESS OTHERWISE STATED.
2. ALL EXCAVATION TO BE FREE OF ICE, SNOW AND DEBRIS AT TIME OF BACKFILLING.
3. DEPTH OF GUTTER MAY BE LOWER THAN TOP EDGE OF MANHOLE VAULT.
4. FOLLOW THE CITY STANDARD 1390 3.5.3, CONCRETE REPAIR TO PAVEMENT:
-THE CITY MAY ON OCCASION REQUEST THAT THE CUT BE REPAIRED WITH 305mm OF CONCRETE FROM THE TOP OF EXISTING ASPHALT.
-THE CONCRETE SHALL BE LEVEL WITH THE EXISTING ASPHALT.
-THE CONCRETE SHALL BE BROOM FINISHED PERPENDICULAR TO THE DIRECTION OF TRAVEL.
5. MANHOLE VAULTS TO BE GPS'D AND SURVEYED AT EACH CORNER BEFORE BACKFILL INSTALLED.
6. MANHOLE VAULTS ARE SUPPLIED WITH STANDARD 305mm (12") THICK CONCRETE TRANSITION RING AND 64MM (2.5") THICK CAST IRON FRAME AND COVER.
7. MODIFIED CONCRETE TRANSITION RINGS (COLLARS) CAN BE USED IN CONJUNCTION WITH THE STANDARD CONCRETE TRANSITION RING TO ADJUST TO THE BURIED DEPTH OF THE MANHOLE VAULT.
-TYPICAL MODIFIED TRANSITION RINGS ARE 150mm (6") AND 230mm (9") THICK.
-THE MODIFIED TRANSITION RINGS TO BE PLACED ON TOP ON STANDARD TRANSITION RING.
REFER TO M2-58 SPECIFICATION FOR VAULT DETAILS.
8. ADDITIONAL CAST IRON FRAME AND COVER GRADING RINGS MAY BE REQUIRED TO ADJUST THE MANHOLE VAULT ENTRY WAY TO FINAL GRADE.
-ENGINEERING IS RESPONSIBLE TO ORDER THIS ADDITIONAL MATERIAL.
9. REFER TO M2-58 SPECIFICATION FOR VAULT DETAILS.

REFERENCE:

1. THE CONSTRUCTION DEPENDS ON THE WEATHER CONDITIONS. REFER TO "COLD WEATHER CONCRETING REQUIREMENTS FOR BURIED CONCRETE CABLE DUCT BANKS", OR "DUCT BANK AND MANHOLE VAULT WARM WEATHER CONSTRUCTION REQUIREMENTS AND SPECIFICATION"

APPROVED FOR CONSTRUCTION



INTERNAL USE ONLY
MANHOLE VAULT BACKFILL
IN-STREET AND IN-SIDEWALK
CONSTRUCTION

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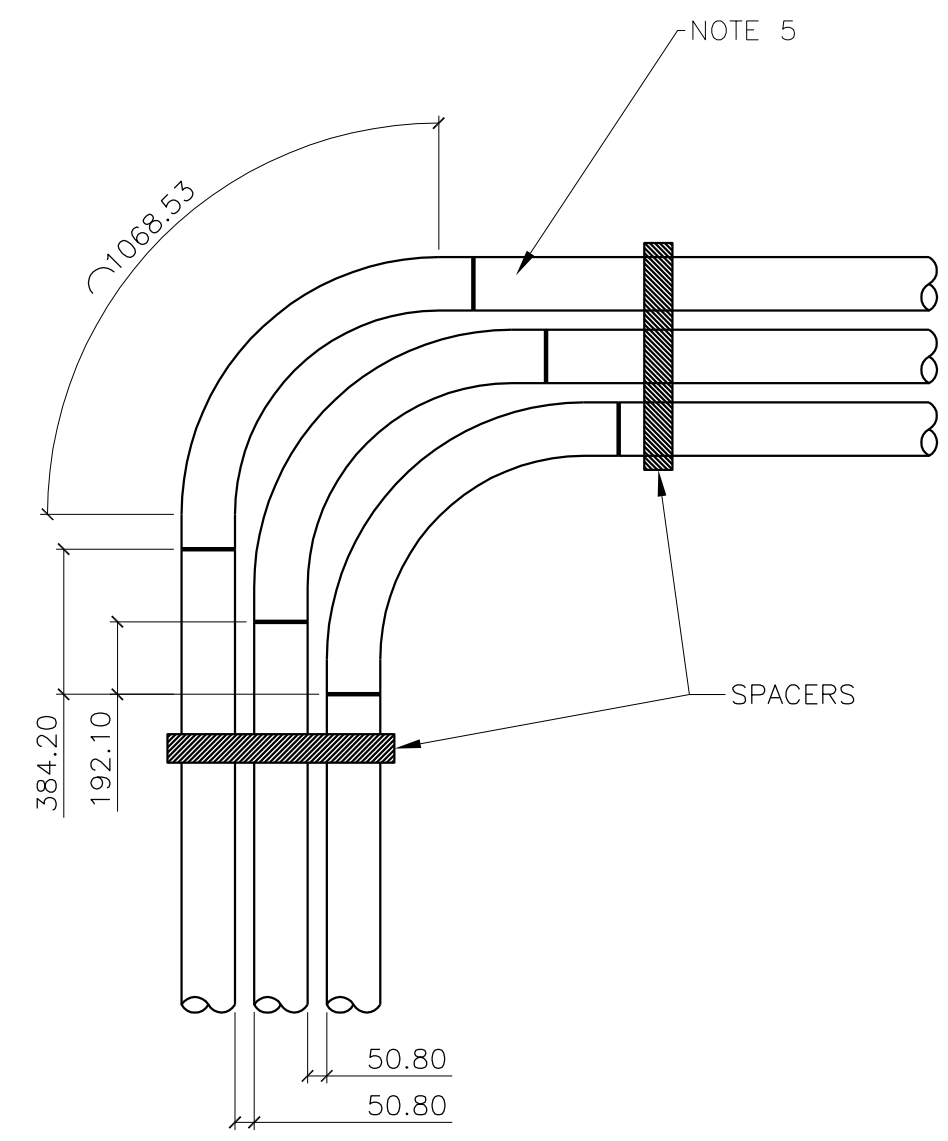
DESIGNED BY J.ZHANG
DRAWN BY T.WEISE
APPR'D BY M.ERETH
SEALED BY
DATE (Y-M-D) 2015-09-21
-CHANGED NOTE #4.

ENGINEERING SEAL.

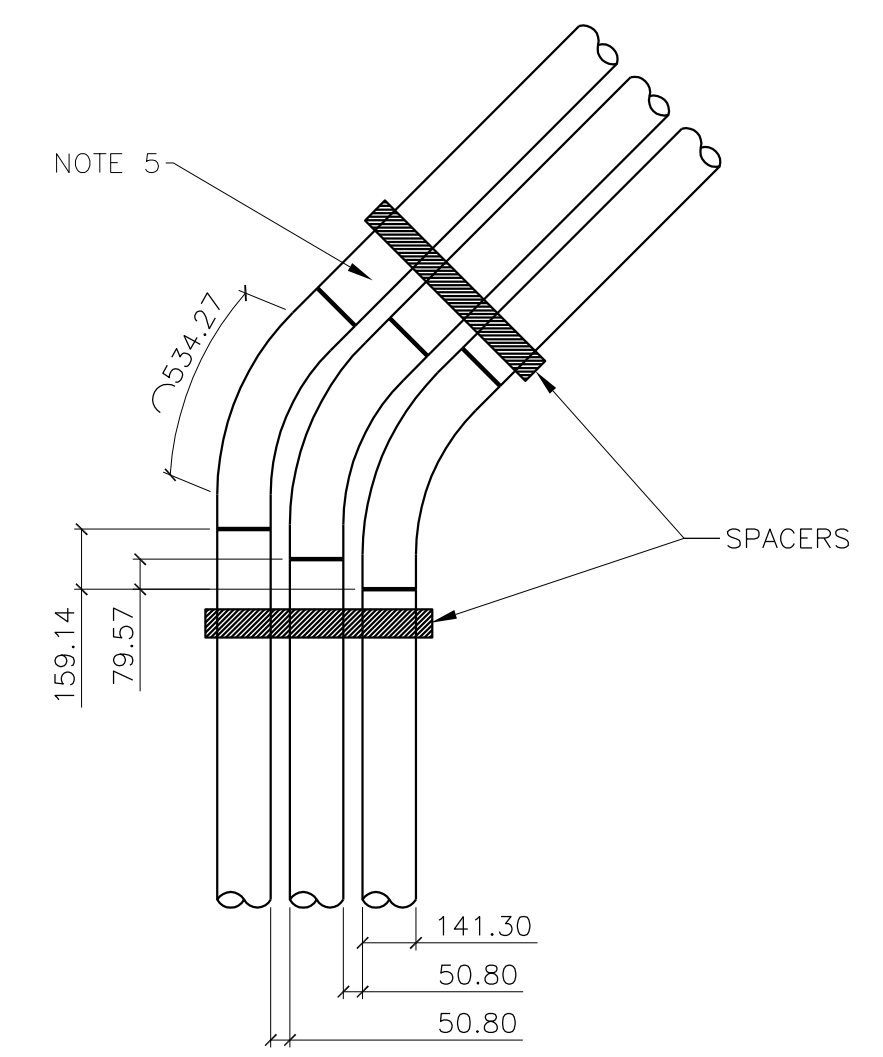
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DRAWN BY A.GATZKE
CHECKED BY
DATE (Y-M-D) 2014-12-22

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DESIGNED BY J.ZHANG
CHECKED BY J.ZHANG
APPROVED BY M.ERETH
SEALED BY M.ERETH
DATE (Y-M-D)

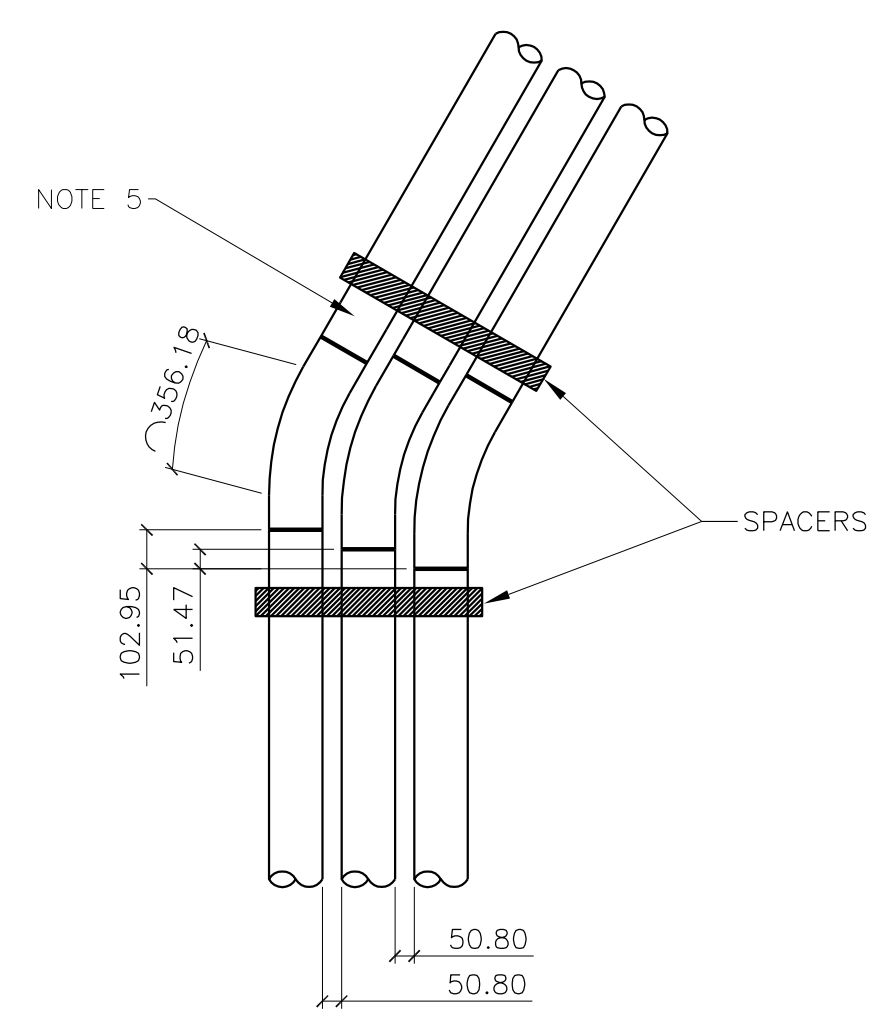
DUCT BANK SWEEPS				
SWEEP (DEGREES)	DIAMETER (mm)	T (EXPANSION JOINT) (mm)	R (RADIUS OF CURVE) (mm)	ADJACENT PARALLEL BEND SHIFT (mm)
30	141.3	92.075	609.6	51.47
45	141.3	92.075	609.6	79.57
90	141.3	92.075	609.6	192.1



90° SWEEP OF 3x3 DUCT BANK



45° SWEEP OF 3x3 DUCT BANK



30° SWEEP OF 3x3 DUCT BANK

LEGEND:
 - ARC LENGTH

- NOTES:
- FOR SMALL DEGREE BEND IN DUCT BANK (LESS THAN 30°), BEND PVC PIPES TO FIT.
 - FOR BENDS GREATER THAN 30°, USE SWEEPS OR ELBOWS.
 - SPACERS ARE USED AT THE BEGINNING AND END OF BENDS.
 - THE OFFSET OF BENDING BETWEEN TWO ADJACENT PARALLEL PIPES IS DIFFERENT ACCORDING TO THE DEGREE OF SWEEPS.
 - FORM AROUND ELBOWS FROM SPACER TO SPACER, REFER TO B-14-100 NOTE 7 FOR FORM SPACING FROM CONDUITS.

APPROVED FOR CONSTRUCTION

AutoCAD

DESIGNED BY X.ZHANG
 DRAWN BY D.REDEKOPP
 APPR'D BY L.MOEN
 SEALED BY
 DATE (Y-M-D) 2016-05-11

ENGINEERING SEAL.

DRAFTING DEPT.
 DRAWN BY A.GATZKE
 CHECKED BY
 DATE (Y-M-D) 2015-03-09

SaskPower INTERNAL USE ONLY
 127mm CONDUIT SWEEP
 30°/45°/90°

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 DESIGNED BY X.ZHANG
 CHECKED BY M.ERETH
 APPROVED BY M.ERETH
 SEALED BY M.ERETH
 DATE (Y-M-D)

DESIGNED BY X.ZHANG
 CHECKED BY M.ERETH
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 SEALED BY M.ERETH
 DATE (Y-M-D)

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104
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-CHANGES TO NOTE 5