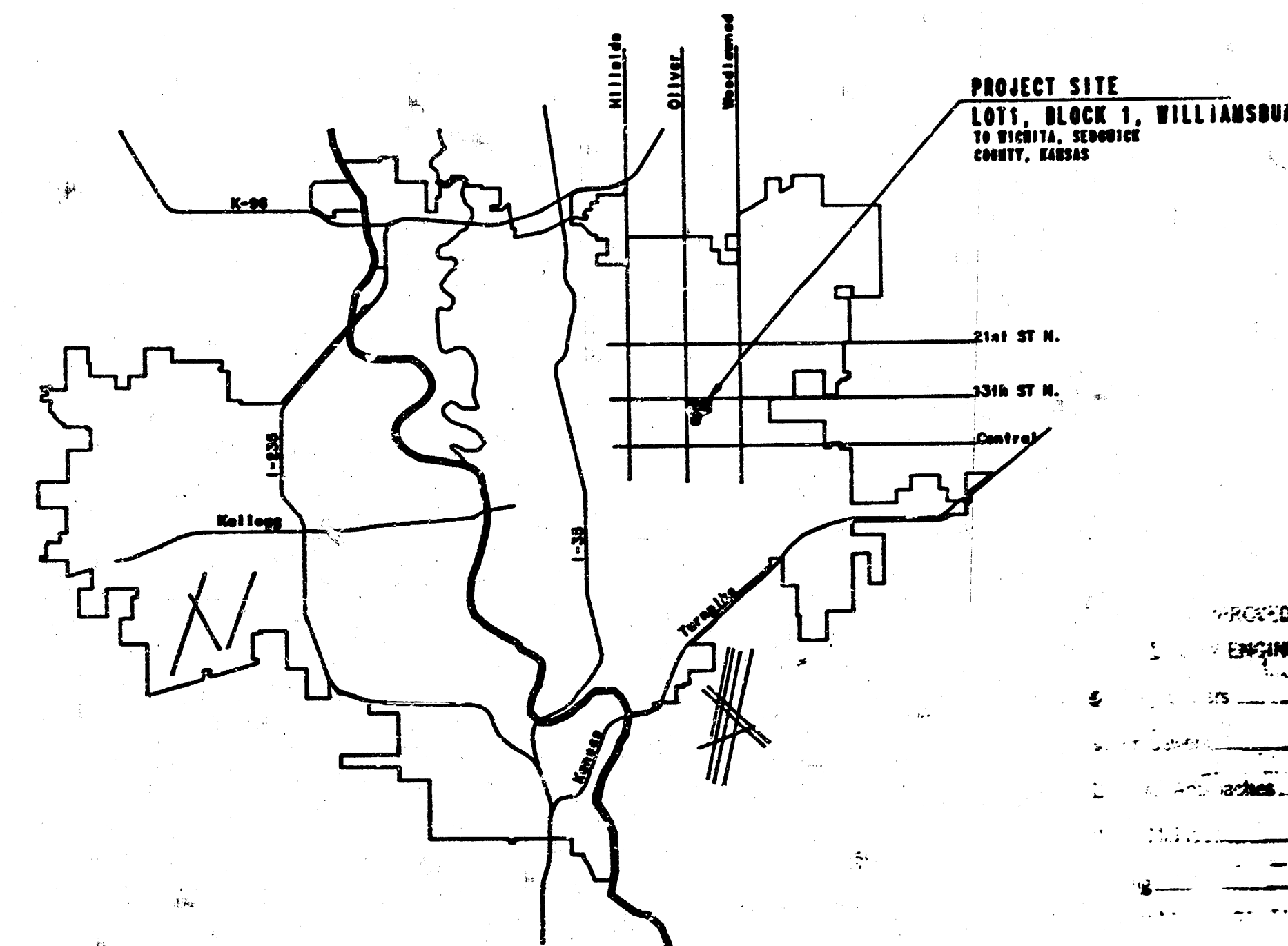


CONSTRUCTION PLANS FOR SANITARY SEWER IMPROVEMENTS FOR THE ADVANTAGES APARTMENTS

THE CITY OF WICHITA,
SEDGWICK COUNTY, KANSAS
MICHAEL E. LINDEBAK, P.E. CITY ENGINEER

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APPROVED AS NOTED
By CITY ENGINEER OF WICHITA
Sanitary Sewers *M. E. Lindebak*
Storm Sewers _____
Driveway Approaches _____
Water Mains _____
Paving _____

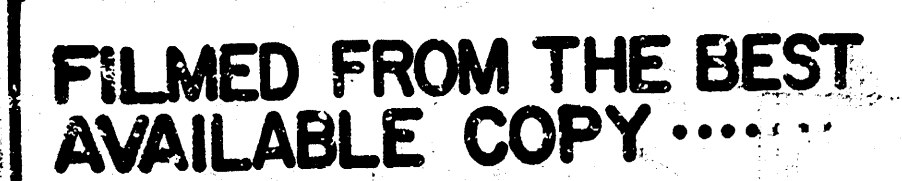
CITY OF WICHITA PROJECT NO. 448-76-245-80001-000-000-136

JULY, 1986

PLANS PREPARED BY
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
ENGINEERS
WICHITA, KANSAS



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City of Wichita, Kansas

Weight: 180 Lb.



- * OUTSIDE DIA TOP OF COVER
- * OUTSIDE DIA. BOTTOM OF COVER

SECTION VIEW



Weight: 240 Lbs.

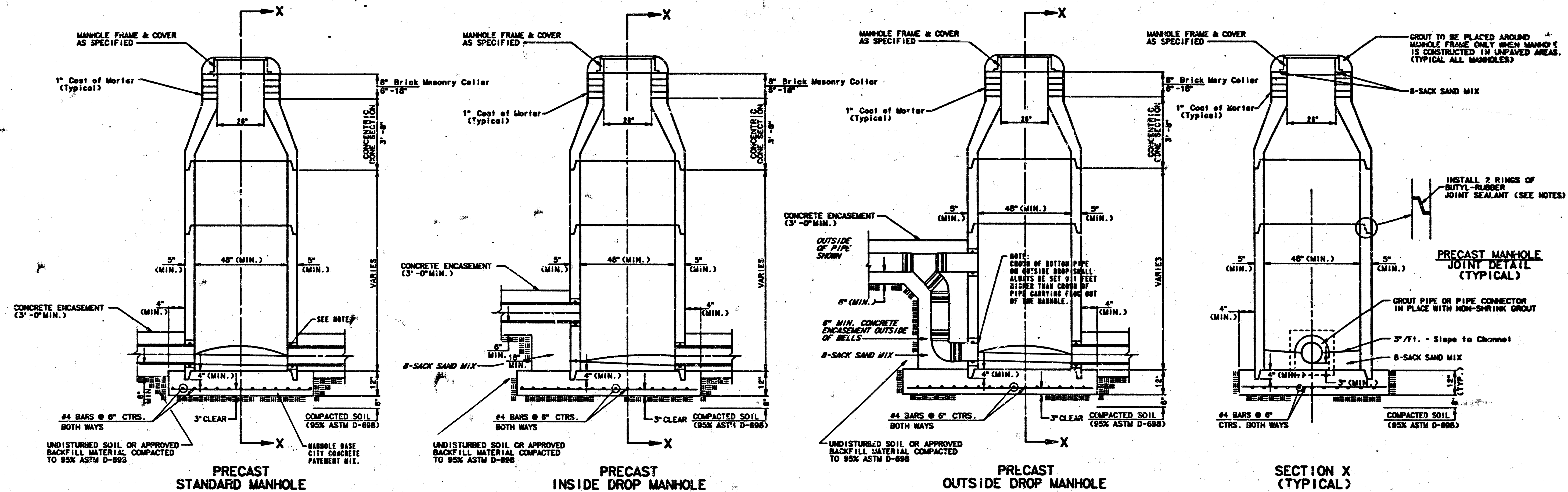
GENERAL NOTES

1. MANHOLE CASTINGS SHALL BE MANUFACTURED USING GOOD QUALITY GRAY IRON CONFORMING TO THE CLASS 30 OF A.S.T.M. DESIGNATION A-48. DIMENSIONS AND WEIGHTS SHOWN ON THE DETAIL TAILED DRAWINGS SHALL BE CONSIDERED AS MINIMUM REQUIREMENTS AND ANY DEVIATIONS FROM THE DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE DISAPPROVED. FINISHES SHALL BE OF UNIFORM QUALITY, FREE FROM BLOWHOLES, POROSITY, HAD SPOTS, SHRINKAGE DISTORTIONS OR OTHER DEFECTS.
2. MANHOLE CASTINGS SHALL BE COATED WITH AN ASPHALT PAINT RESULTING IN A SMOOTH, TIGHT AND DURABLE COATING WHICH IS NOT BRITTLE OR TACKY.
3. MANHOLE CASTINGS SHALL BE MANUFACTURED SUCH THAT A COVER MANUFACTURED BY ANY ONE FOUNDRY WILL FIT TIGHTLY WITH THE FRAME MANUFACTURED BY ANOTHER FOUNDRY AND STILL MEET ALLOWABLE CLEARANCES AND NON-ROCKING REQUIREMENTS. THIS WILL REQUIRE MANUFACTURING OF THE MATCHING FACES ON THE COVER AND THE FRAME TO CLOSE TOLERANCES.
4. THE OUTSIDE CIRCUMFERENCE OF THE VERTICAL FACE OF THE COVER AND THE INSIDE CIRCUMFERENCE OF THE VERTICAL FACE IN THE FRAME SHALL BE MANUFACTURED TO TOLERANCES SUCH THAT THE CLEARANCE BETWEEN THE COVER AND FRAME WILL NOT EXCEED .001 INCH ANYWHERE AROUND THE CIRCUMFERENCE OF THE COVER. THE SEATING SURFACES BETWEEN THE COVER AND FRAME SHALL BE MANUFACTURED TO TOLERANCES THAT PREVENTS THE COVER FROM CONTACT FOR THEIR FULL CIRCUMFERENCE TO PRECLUDE THE COVER FROM ROCKING IN THE FRAME.
5. THE MANHOLE FRAME AND COVER SHALL BE MARKED WITH LETTERING INDICATING THE NAME OF THE MANUFACTURER AND THE YEAR WHEN THE COVER OR FRAME WAS CAST. THE COVER SHALL BE IDENTIFIED WITH THE IDENTIFICATION NUMBER OF THE COVER. THE FRAME SHALL BE IDENTIFIED WITH THE IDENTIFICATION SHALL BE "CITY OF WICHITA SEWER DEPARTMENT". THE WORD DEPARTMENT SHALL BE ABBREVIATED. THE TEXTURE OF THE TOP SURFACE OF THE COVER SHALL BE MANUFACTURED TO BE CHECKERED IN ORDER TO PROVIDE THE DRAWINGS WITH A CHECKERED SURFACE TO BE UTILIZED TO HIGHLIGHT THE LETTERING ON THE COVER SURFACE. THE TOTAL AREA OF SMOOTH SURFACE OF THE BLOCKOUTS SHALL BE 10% OF THE TOTAL AREA OF THE COVER. THE POSITIONING OF SMOOTH BLOCKOUTS AND LETTERING MAY VARY FROM THAT SHOWN ON THE DETAIL DRAWINGS.

SHEET 3 of 5
SHEET C14

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SEWER APPURTENANCES DETAILS ADOPTED AS STANDARD DESIGN BY CITY OF WICHITA



- GENERAL NOTES**
- PRECAST MANHOLE NOTES**
1. ALL PRECAST CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE LATEST REVISION OF A.S.T.M. C478 AS MODIFIED BY THE SPECIFICATIONS.
 2. NON-SHRINK GROUT SHALL BE NON-METALLIC TYPE.
 3. APPROVED FLEXIBLE WATERSTOP GASKETS SHALL BE INSTALLED TO JOIN THE SEWER TO THE MANHOLE WALL WHEN A P.V.C. COMPOSITE PIPE OR P.V.C. PIPE IS USED. FOR OTHER TYPES OF PIPE THE SEWER SHALL BE GROUTED TO PLACE WITH NON-SHRINK GROUT. THE SEWER PIPE SHALL BE SUPPORTED WITH CONCRETE ENCASEMENT A MINIMUM OF 3 FEET FROM THE MANHOLE WALL AND TO THE FIRST JOINT FOR P.V.C., SUCH THAT THE JOINT REMAINS FLEXIBLE.
 4. ALL INSIDE SURFACES OF THE CONCRETE MANHOLE WHICH WOULD BE EXPOSED TO SEWER GAS SHALL BE COATED WITH 2 COATS THEREOF, SERIES 40 M-BUILD EPOXYLINE, DRY THICKNESS OF 8 MILS (MIN.).
 5. EXTERIOR MANHOLE WALLS SHALL BE COATED WITH 1 COAT MONILAN 633 BITUMINOUS COATING.
 6. JOINT SEALING COMPOUND SHALL BE REBT SEAL NO. 2 OR APPROVED EQUAL.
 7. PRECAST MANHOLES SHALL BE SET AT LEAST 4 INCHES INTO THE MANHOLE BASE.
 8. TOP OF MANHOLE FLOOR SLAB SHALL BE AT LEAST 3 INCHES BELOW THE FLOW LINE OF THE OUTLET PIPE TO INSURE SUFFICIENT MINIMUM THICKNESS OF SLABED INVERT.
 9. LIFTING HOLES SHALL BE FILLED WITH NON-SHRINK GROUT AND THE INTERIOR SURFACE COATED AS SPECIFIED.
 10. MORTAR USED IN MASONRY CONSTRUCTION SHALL CONTAIN 8 BAGS OF CEMENT PER CUBIC YARD. CONCRETE USED IN MANHOLE BASES SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE FOR CONCRETE PAVING CONSTRUCTION AS SPECIFIED IN THE CITY STANDARD PAVING SPECIFICATIONS. WHEN CITY CONCRETE PAVEMENT MIX WITHOUT ANY EXTENDING AGGREGATE, PORTLAND CEMENT SHALL BE PLACED AROUND THE MANHOLE RING AS SHOWN ON THE DRAWINGS WHEN MANHOLES ARE CONSTRUCTED IN UNPAVED AREAS. MANHOLES CONSTRUCTED IN PAVED AREAS SHALL BE CONSTRUCTED WHEN PIPE SIZES ARE 12\"/>

11. REINFORCING STEEL SHALL BE INSTALLED IN THE MANHOLE BASES AND SHALL CONSIST OF NO. 4 BARS PLACED ON 6\"/>
- 12. OPENINGS SHALL BE CUT INTO THE MANHOLE WALL WHEN OUTSIDE DROPS ARE CONSTRUCTED ON EXISTING MANHOLES. SUCH OPENINGS CUT INTO EXISTING MANHOLES SHALL BE AS SMALL AS PRACTICAL TO FACILITATE INSTALLING AND CHANGING THE NEW PIPE IN PLACE. WATERSTOP GASKETS SHALL BE USED WITH P.V.C. AND A.B.S. COMPOSITE PIPE. THE NEW PIPE SHALL BE CURVED INTO THE OPENING USING AN APPROVED WORKING GROUT FOR THE FULL MANHOLE WALL THICKNESS. THE EXTERIOR OF THE COMPLETED CORRECTOR SHALL BE SEALED WITH AN APPROVED BITUMINOUS COATING SUCH THAT THE CORRECTOR WILL BE WATER TIGHT. FLOOR OF MANHOLE SHALL BE NOTIFIED TO FORM NEW FLOW CHANNEL FOR THE NEW CONNECTION AS INDICATED BY THE DRAWING. THIS WORK, INCLUDING NOTIFICATION OF MANHOLE FLOOR, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR OUTSIDE DROP STACK CONSTRUCTION ON EXISTING MANHOLE.
- 13. THE FLOORS OF ALL MANHOLES SHALL BE SHAPED WITH FLOW CHANNELS SUCH THAT THE MANHOLES WILL BE SELF-CLEANING AND FREE OF AREAS WHERE SOLIDS COULD BE DEPOSITED AS SEWAGE FLIES THROUGH THE MANHOLE FROM ALL INLET PIPE TO THE OUTLET PIPE. FLOW CHANNELS SHALL BE FORMED TO MATCH THE BOTTOM VALVES OF THE INFLOWING PIPES AND THE OUTFLOWING PIPE AS SHOWN BY THE DRAWINGS EXCEPT FOR INSIDE DROP MANHOLES. FLOW CHANNELS FOR INSIDE DROP MANHOLES SHALL BE CONSTRUCTED AS INDICATED BY THE DRAWING. MANHOLE FLOORS SHALL HAVE SLOPES OF 3 INCHES PER FOOT IN THE AREAS OUTSIDE OF THE FLOW CHANNELS TO PROVIDE COVER FOR THE FLOW CHANNELS. PIPES LAIN THROUGH MANHOLES SHALL HAVE THE TOP HALF REMOVED TO REEL LINES FOR THE FULL INSIDE DIAMETER OF THE MANHOLE. MANHOLE FLOORS SHALL THEN BE SHAPED AROUND THE BOTTOM HALF OF THE PIPE WHICH FORMS THE FLOW CHANNEL.
- 14. PIPES INSTALLED WITHIN THE EXCAVATION MADE FOR THE MANHOLE SHALL BE CHABLE WITH CONCRETE IN THE LIMITS OF THE MANHOLE EXCAVATION. WHEN CLAY PIPE IS USED, THE CHABLE SHALL EXTEND TO THE FIRST JOINT OUTSIDE THE MANHOLE. THE CHABLE SHALL BE TERMINATED AT THE CLAY PIPE JOINT IN A MANNER WHICH WILL MAINTAIN THE INTEGRITY OF THE JOINT. EAST OF CHABLE WITHIN MANHOLE EXCAVATION OR TO CLAY PIPE JOINTS ADJACENT TO MANHOLE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE CHANNEL.

15. MANHOLE COVER CASTINGS AND MANHOLE FRAME CASTINGS SHALL CONFORM TO THE REQUIREMENTS AS INDICATED IN THE STANDARD SPECIFICATIONS AND AS SHOWN IN THE STANDARD DETAIL DRAWING.
16. THE VERTICAL DROP IN INSIDE DROP MANHOLES SHALL NOT EXCEED 4\"/>
- 17. STANDARD MANHOLES AND STANDARD INSIDE DROP MANHOLES SHALL BE BID AS STANDARD MANHOLES FOR THE TYPE AND DIAMETER INDICATED. OUTSIDE DROP MANHOLES SHALL BE BID AS STANDARD OUTSIDE DROP MANHOLES FOR THE TYPE AND DIAMETER INDICATED. ALL MANHOLE DIAMETERS WILL BE 4\"/>
- 18. A BRICK MASONRY COLLAR SHALL BE INSTALLED BETWEEN THE CAST IRON FRAME AND THE CONCENTRIC CORE. THE COLLAR WILL HAVE 6\"/>

SHEET 4 of 5
SHEET C15

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City of Wichita, Kansas

Technical drawing of a manhole structure, showing a cross-section and a side elevation view.

Cross-section View (Top):

- Top opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.
- Manhole opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.
- Manhole opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.
- Manhole opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.

Side Elevation View (Bottom):

- Top opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.
- Manhole opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.
- Manhole opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.
- Manhole opening: 30" diameter.
- Inner lining: 8" BRICK MASONRY.
- Outer structure: 1" COAT OF MORTAR.

Notes:

- NOTE: CROWN OF PIPE FLOWING TO BE 24" IN ANY OF 1' LONGER THAN CROWN OF PIPE FLOWING OUT.
- FLOOR SHAPING SLOPE = 3" TO 1'
- MANHOLE BASE CITY CONC PAWT MIX

SEE GEN NOTES

8" BRICK MASONRY

1" COAT OF MORTAR

26" 2

50" 2

MANHOLE WALL

CITY CONC. PAV'T HUE

50" MIN. - 48" HIG

8"

SEE GEN NOTES

2" SACK SAND MIX FOR PIPE SUPPORT TO LIMIT OF SCAFF

NOTE BOTTOM OF SHAFT BE 0.1' AB OUTFLOWING PIPE

VARIEBLE

FLOOR SHAPING

6" MIN.

MANHOLE BASE

SEE GEN NOTES

6" MIN.

Technical drawing of a manhole structure, showing cross-sections and construction details. The drawing includes the following elements:

- Top Section:**
 - Labels: "SEE GEN. NOTES", "8" BRICK MASONRY", "1" COAT OF MORTAR".
 - Dimensions: "24" (width of the top opening).
 - Feature: "RING AND LID AS SPECIFIED" (indicated by a dashed line).
- Side Section (Left):**
 - Labels: "CHANNEL FLOW OF WATER", "REVERSE 'Y'".
 - Feature: "B-SACK SAND MIX" (indicated by a stippled pattern).
 - Text: "8" MIN. CONCRETE ENCASUREMENT OUTSIDE OF BELLS OR TO THE LIMIT OF EXCAVATION WHEN MORE THAN 6'".
- Side Section (Right):**
 - Labels: "8" MIN. TO SOIL", "MASONRY COLLAR", "30" MIN. - 6" MAX.", "VARIABLE", "MANHOLE WALL", "CITY CONC. PAV'T MIX", "6" MIN.", "SLOPE 5:1".
 - Text: "NOTE: CROWN OF BOTTOM PIPE ON OUTSIDE DROP SHALL ALWAYS BE SET 0.1 FT. HIGHER THAN CROWN OF PIPE CARRYING FLOW OUT OF THE MANHOLE."
- Bottom Section:**
 - Labels: "MANHOLE BASE", "CITY CONC. PAV'T MIX", "SEE GEN. NOTES", "4" MIN.", "6" MIN."

1. PORTLAND CEMENT MASONRY CONSTRUCTION SHALL CONTAIN 8 BAGS OF CEMENT PER CUBIC YARD. CONCRETE USED IN MANHOLE WALLS AND BASES SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE FOR PORTLAND CEMENT CONSTRUCTION. ALL REINFORCING STEEL SHALL BE PLACED IN THE MIDDLE OF THE WALLS. PAYING, FINISHING AND CURING CITY CONCRETE PAVEMENT MIX WITHOUT AN EXHAUSTING ADDITIVE. PORTLAND CEMENT SHALL BE PLACED AGAINST THE EXTERIOR SURFACE OF THE MANHOLE WALLS. REINFORCING STEEL SHALL BE PLACED 4" UNCOVERED ABOVE. TYPE "C" MANHOLES CAN BE CONSTRUCTED ONLY WHEN PIPE DIAMETER IS 6" OR SMALLER. THE INSIDE DIAMETER OF TYPE "C" MANHOLE SHALL BE 4". COMPLETED MANHOLE SHALL BE AT LEAST LEVEL WITH WATER TABLE.

2. REINFORCING STEEL SHALL BE INSTALLED IN THE MANHOLE BASE. REINFORCING STEEL SHALL CONSIST OF NO. 4 BARS PLACED ON 6" CENTER "C" IN BOTH DIRECTIONS. REINFORCING STEEL SHALL BE PLACED 6" ABOVE THE BOTTOM OF THE MANHOLE BASE. REINFORCING STEEL SHALL BE PLACED 4" ABOVE THE REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.

3. AN OPENING SHALL BE CUT IN THE MANHOLE WALL FOR THE UPPER INLET PIPE FOR INSIDE AND OUTSIDE DOWNSPOUTS. THE UPPER INLET PIPE SHALL BE GROUDED IN THIS OPENING WITH NO HANGS. ABOUT. THE EXTERIOR OF THIS GROUDED CONNECTION SHALL BE SEALED WITH A PROVED IMPERVIOUS COATING SUCH THAT CONNECTION WILL BE WATER TIGHT.

4. THE FLOORS OF ALL MANHOLES SHALL BE SHAPED WITH FLOW CHANNELS SUCH THAT THE MANHOLES WILL BE SELF-CLEANING AND FREE OF AREAS WHERE DEPOSITS OF DEBRIS OR OTHER MATERIALS CAN ACCUMULATE. ALL INLET PIPES TO THE OUTLET PIPE, FLOW CHANNELS SHALL BE FORMED TO MATCH THE BOTTOM MAJORS OF THE INLET/INLET PIPES AND THE OUTFLOWING PIPES. ALL INLET PIPES SHALL BE PLACED AT THE SAME ELEVATION. REINFORCING STEEL FOR INSIDE DOWNSPOUT MANHOLES SHALL BE CONSTRUCTED AS INDICATED BY

5. PIPES INSTALLED WITHIN THE EXCAVATION MADE FOR THE MANHOLE SHALL BE CRADLED WITH CONCRETE TO THE LIMITS OF THE MANHOLE EXCAVATION. WHEN CLAY PIPE IS USED, THE CRADLE SHALL EXTEND TO THE FIRST JOINT OUTSIDE THE MANHOLE. THE CRADLE SHALL BE TERMINATED AT THE CLAY PIPE JOINT IN A MANNER WHICH WILL MAINTAIN THE FLEXIBILITY OF THE JOINT. COST OF CRADLE WITHIN MANHOLE EXCAVATION OR TO CLAY PIPE JOINTS ADJACENT TO MANHOLE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.

5. PILES INSTALLED WITHIN THE EXCAVATION MADE FOR THE MANHOLE SHALL BE CRAWLED WITH CONCRETE TO THE LIMITS OF THE MANHOLE EXCAVATION. WHEN CLAY PILE IS USED, THE CRACKLE SHALL EXTEND TO THE FIRST JOINT OUTSIDE THE MANHOLE. THE CRACKLE SHALL BE TERMINATED AT THE CLAY PILE JOINT IN ORDER TO MAINTAIN THE JOINTS AT THE MINIMUM LEVEL OF STRESS. COST OF CRACKLE WITHIN MANHOLE EXCAVATION OR TO CLAY PILE JOINTS ADJACENT TO MANHOLE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.
6. MANHOLE COVER CASTINGS AND MANHOLE FRAME CASTINGS SHALL CONFORM TO THE REQUIREMENTS AS INDICATED IN THE STANDARD SPECIFICATIONS AND AS SHOWN IN THE STANDARD DETAIL DRAWINGS.
7. THE VERTICAL DROP IN INSIDE DROP MANHOLES SHALL NOT EXCEED 4" FOR INFLUWING PILES SIZED 12" OR SMALLER AND 2" FOR INFLUWING PILES LARGER THAN 12". THE COVER SHALL BE SET LOWER THAN THE OUTFLOWING PILE.

8. STANDARD MANHOLES TYPE "C" AND STANDARD INSIDE DROP MANHOLES TYPE "C" SHALL BE BID AS STANDARD MANHOLES FOR THE TYPE AND DIAMETER INDICATED. OUTSIDE DROP MANHOLES TYPE "C" SHALL BE BID AS STANDARD OUTSIDE DROP MANHOLES FOR THE TYPE AND DIAMETER INDICATED. ALL MANHOLE DIAMETERS WILL BE 4' UNLESS INDICATED OTHERWISE.