SPECIFICATION

for

CONDUIT LINE - MEAD SUBSTATION TO WICHITA UNDERGROUND SYSTEM

Engineering Department
Kansas Gas and Electric Company
Wichita, Kansas

August 1951

SPECIFICATIONS
for
CONDUIT LINE - MEAD SUBSTATION TO WICHITA UNDERGROUND SYSTEM

GENERAL

Description

These specifications and plans accompanying same provide for the installation of conduit lines and manholes emanating from the Kansas Gas and Electric Company's Mead Substation, located at 125 No. Rock Island St., Wichita, Kansas, to locations shown on drawing SK-1378, and connecting into owner's existing service hole #829. Plans include the following drawings:

KA-3850	Details of 15 duct section
KA-3851	Details of 10 duct section
KD-1726	Manhole Frame and Cover 3F and 9C
KD-1745	Two way manhole
KD-1744	Three way manhole
KD-1749	Four way manhole
KD-1760	Three way manhole
KD-1779	Two way manhole
KD-1787	Service hole #829
KD-3809	Conduit construction, 3 sheets

Definition of Terms

The term "owner" as used herein refers to and designates Kansas Gas and Electric Company. The term "contractor" refers to the party or parties contracting to perform the work as specified in these specifications, or shown on the accompanying plans.

Scope of Work

The contractor shall supply all labor, transportation, material and tools necessary for the proper completion of the above described work, except the owner will furnish all manhole castings. Any minor details of equipment or materials necessary and implied, but not specifically mentioned, shall be furnished without additional expense beyond the contract price.

Material and Measurements

Before ordering any material or doing any work, the contractor shall verify all measurements at the construction site and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of difference between actual dimensions and the measurements indicated on the drawings.

Examination of Premises

Before submitting proposals for his work, the contractor will be expected to have examined the premises and have satisfied himself as to the existing conditions under which he will be obliged to operate or that will in any manner affect the work under this contract. No allowances shall be made subsequently in this connection in behalf of the contractor for any error or negligence on his part.

Bond

The general contractor will be required to furnish a surety and statutory bond for the full amount of the contract price in such forms and with such sureties as are satisfactory to the owner, and such as will release the owner from all labor and material claims or liens of any kind.

Permits

The contractor shall pay for all permits, royalties and license fees pertaining to his work. The contractor shall comply with all laws, ordinances, rules and regulations bearing on the conduct of this work. If the contractor performs any work contrary to such laws, ordinances, rules and regulations, he shall bear all costs arising therefrom.

Insurance

The contractor shall take out immediately upon accepting this contract insurance which shall include, but shall not be limited, to the following types:

1. Compensation Insurance
2. Public Liability Insurance
3. Property Damage Insurance
4. Vehicle Bodily Injury and Property Damage Insurance

This insurance must be carried with companies and in amounts acceptable to the owner. Contractor and owner shall be the beneficiaries as their respective interests shall appear as of the time when any loss, injury or damage occurs. None of the insurance provided for herein shall be terminable except upon the written consent of both owner and contractor. Contractor shall likewise cause his sub-contractors, if any, to provide for such insurance. Contractor shall furnish owner with all requisite insurance policies or copies thereof or other satisfactory evidence thereof within ten days after accepting this contract and before starting work. No insurance coverage shall be construed as waiving or releasing any of contractor's responsibility under this contract.

Construction and Personnel

The contractor shall furnish competent labor and supervisors and shall carry on the work at his own risk until the job is completed in a manner

of the contractor and not of the owner, irrespective of who pays them. The contractor shall indemnify the owner and hold him harmless from and against any and all loss, costs, damage and expenses, and the contractor agrees to defend at contractor's own expense any suit or suits that may be brought against the owner by reason of any act or omission of any employee, servant or agent of the contractor, including those, if any, originally employed by the owner and utilized by the contractor.

Material and Workmanship

All materials, including those not specifically called for herein, shall be new and the best of their respective kinds. The work shall be performed in a first class manner by competent, experienced workmen, and the completed job will be subject to the final acceptance of the owner. The contractor shall maintain a competent foreman on the job throughout the time of construction. The contractor shall lay out all measurements and be responsible for the correct construction and assembly of the various parts of the work.

Protection against accidents, damages, etc.

The owner shall not be responsible or be held liable for any damage to person or property consequent upon the use, misuse or failure of any hoist, rigging, blocking or other equipment used by the contractor or any of his sub-contractors even though said equipment be furnished or loaned to the contractor by the owner. The acceptance and/or use of any such equipment by the contractor or his sub-contractors shall be construed to mean that the contractor accepts all responsibility for any claim for damages whatsoever resulting from the use, misuse or failure of such equipment whether such damage be to his own employees or property, or to the employees or property of others.

Payments

Payments on contract or extra accounts shall be made in true and lawful funds on or before the 10th of each month for 90% of all labor and materials incorporated in the project on the first day of the month less all previous payments. The owner shall finally accept or reject the work within 30 days after its completion, and the final payment of all accounts shall be made within 30 days thereafter, provided however that the contractor shall furnish satisfactory evidence to the owner that all labor and material accounts connected with the execution of this contract shall have been fully paid by the contractor.

Drawings and Specifications

Drawings and specifications are instruments of service only and as such are the property of the owner to whom they shall be returned at the completion of the work. All work shall be executed according to the true intent and meaning of the drawings and specifications which are intended to include everything requisite and necessary for the proper completion of the work. Any discrepancies or inaccuracies, if noted in the drawings or specifications, or any question as to their meaning shall be reported

to the owner and should comply with his interpretation of the intent and meaning of such. The owner accepts no responsibility for the location of obstructions as shown on the plans, but these obstructions are merely shown for the purpose of determining the best location for manholes and duct lines.

Extra Work

It is recognized that extra work is a necessary part of the construction of underground conduit lines where unknown obstructions may be encountered. Changes in plans due to these obstructions shall be approved in writing by the owner and shall be paid for on the basis of bids for extra costs submitted with contractor's original bid.

Other changes, alterations or additions involving extra labor and material which are approved and ordered in writing by the owner shall be paid for by the owner on the basis of cost of labor and material to the contractor plus 10% on such cost unless otherwise agreed at time of ordering such work.

Orders for changes as above specified shall in no way invalidate the original contract.

Interference to Public

All work shall be done in a manner resulting in [illegible] of inconvenience to the public and adjacent property owners. All material removed by excavation shall be piled carefully and removed as quickly as possible. All gutters and drains shall be kept clear of all construction materials and the flow of water therein shall not be obstructed. All fire hydrants shall be kept free of obstructions at all times. All driveways, alleys and other points of entrance or egress for vehicles shall be kept clear of material and tools. Where necessary, bridging and staging shall be provided for the use of pedestrians and vehicles and all such bridging and staging shall be constructed in a manner and maintained in a condition such as to assure safety to the traveling public at all times. City ordinances pertaining to this type of work shall be strictly adhered to regardless if herein specifically mentioned or not.

Inspection

The owner and his representative shall at all times have access to the work wherever it is in preparation or progress. Owner shall be allowed to make measurements during the progress of the work as are necessary for the preparation of owner's maps and records.

Cleaning Up

The contractor shall keep the site of the work clean at all times and at the completion of the work, contractor shall leave the construction site in a neat and clean condition.

Guarantee

The contractor, except as otherwise specified, shall guarantee his work including sub-contracts, for a period of one year from the date of acceptance by the owner and shall leave the work in perfect order at completion. Neither the final certificate of payment nor any provision in the contract documents shall relieve the contractor of the responsibility for negligence or faulty materials or workmanship within the extent and period provided by law and upon written notice the contractor shall remedy any defects due thereto and pay all damages for other work resulting therefrom.

CONDUIT LINES

Conduits

Conduits shall consist of 4 inch inside diameter Korduct, as manufactured by the Johns-Manville Company. Couplings and fittings shall be standard, tapered fittings manufactured by said company. Conduit shall be installed in number and in the manner as shown on the drawings which accompany this specification.

Concrete

Concrete for duct lines shall consist of one part Portland cement and five parts of clean, sharp river sand having a fineness modulus of between 2.5 and 3.5. The water cement ratio shall not exceed 7½ gallons for each sack of cement.

Excavation

All excavations shall be made as nearly true to line as obstructions will permit. The trench shall be excavated entirely from manhole to manhole and to such a width and depth as may be required to accommodate the number of ducts specified. The grade of the trench shall be established by contractor to provide proper drainage into one manhole or both before any conduits between the two manholes in question are installed. In general, the ditch shall be excavated to provide a minimum depth of 2 feet 6 inches from the surface of the street or ground to the top of the conduit line.

Where crossing under railroad tracks, the cover over the concrete shall be increased to a minimum of 3 feet 6 inches in order to protect the construction from excessive concentrated wheel loads. Where it is impossible or impractical to obtain the increased cover, the additional protection to the conduit may be secured by increasing the thickness of the concrete slab above the ducts or by installing a reinforced mat over the construction in order to distribute the load. This shall be done in a manner approved by the owner.

The bottom of the trench shall be graded accurately before any conduits are installed in order to assure that no low pockets exist. Where it becomes

be used and this material shall be thoroughly and effectively tamped before the conduits are installed in order to establish a firm foundation and avoid any sagging of the construction.

The side walls of the trench shall be cut as nearly vertical as possible and shall be shored where necessary to prevent caving of the banks due to traffic and other disturbing conditions.

Where it is necessary to sheath to the bottom of the trench, the width of the trench shall be increased by the amount corresponding to the thickness of the timbering in order to maintain the specified cross-section of the construction.

The trench shall be kept as free as possible from water at all times. Conduits shall not be installed in a wet ditch without the permission of a representative of the owner.

Conduit Installation

All ducts shall be laid true to line and grade, and all joints shall be staggered both horizontally and vertically. The conduit line shall be graded so as to provide drainage of the duct bank into one or both of the adjoining manholes with a minimum gradient of 3 inches per 100 feet of conduit line.

Where changes in formations are deemed expedient in order to avoid excessive depth or extraordinary interferences, explicit permission shall be obtained from the owner for such changes, and particular care shall be exercised in such construction to avoid pockets or dips in the conduit line on account of such construction.

When it becomes necessary to lay the conduit under, over or adjacent to any gas, water or sewer pipes or any other sub-surface structures, full and proper protection shall be afforded such pipes or other structures and the construction shall be made in a manner which will provide satisfactory clearance to the owners of said structures. Where necessary to straddle a gas, water or other pipe or pipes, particular care shall be exercised to prevent the weight of the new construction from resting on such pipes. In no case shall pipes of any nature be solidly encased in a concrete envelope of the conduit line. Proper protection of such structures demands that they be surrounded with a sand or earth cushion or a protecting shell of boards, conduit or other material as may be expedient where they pass through the duct construction.

Concrete separators shall be placed crosswise in the trench at approximately 3 foot intervals and levelled to form the grade for the first duct layer. There shall be a space of 3 inches between the bottom of the trench and the conduits. The ducts shall then be laid by the built-up method, using conduit separators placed near the end of each conduit and No. 6 hangline to hold the ducts in place. The joints shall be staggered both horizontally and vertically and each joint shall be painted or dipped at the time of laying with an asphalt base paint. The concrete shall be poured around and on top of the conduits with great

care being taken to puddle the concrete between the ducts in order to insure that each duct is entirely surrounded by concrete and that no voids exist. The concrete shall be poured so that a layer not to exceed two ducts high is formed longitudinally of sufficient length to allow the initial pouring to become partially solidified so that the ducts will not float as the concrete envelope is poured. Weights may be placed on top of the conduit bank to hold the conduits in position while concrete is poured. If weights are used to keep the conduit from floating, these weights should be removed before the concrete sets completely, and the voids filled with concrete. Concrete shall be carried to a height at least 3 inches above the top tier of the conduits. Care should be taken that concrete is poured in such a manner that the fall of the concrete will not disturb the alignment of ducts.

Conduits shall be laid in a straight line and as true to grade as possible and in no case shall ducts be installed with a divergence from a straight line of more than 1/2 inch per foot of duct, and all bends which are necessary shall be made with as long a radius and as smooth a curve as possible.

A mandrel for the purpose of cleaning the ducts shall be drawn through the ducts at the completion of each conduit run.

Whenever it becomes necessary to make a vertical split in the construction, it is required that the full amount of concrete envelopes specified shall be installed above and below each section of the construction, and that the space between the sections shall be carefully and completely filled with concrete up to a maximum of 6 inches. Where the trench is shored, care must be exercised in withdrawing such timbers in order not to disturb the concrete envelope of the conduit.

Obstructions

No pipes, conduits, sewers or other obstructions belonging to or operated by other utilities, the city or private individuals shall be disturbed or removed without the explicit permission of the owners of said pipes, conduits or sewers. Any changes or relocations of interferences of any kind shall be done in a manner satisfactory to the owner of said interferences.

Backfill

All ditches shall be carefully backfilled with sand in such a manner as to assure a minimum amount of settlement over the conduit bank and in such a manner as to meet City Ordinances regarding this type of backfill. No backfilling shall take place until the concrete covering of the conduits has set sufficiently to permit backfilling without disturbance to the concrete structure.

Repaving

All repaving shall be done in accordance with City Ordinances.

MANHOLES

General

All manholes shall be constructed in accordance with the detail drawings furnished with this specification.

Excavation and Construction

All excavation shall conform closely to dimensions necessary to permit the proper thickness of the wall to be installed. Floor or foundations of the structure shall be put in place first and permitted to become hard before the side wall forms and reinforcing steel are set. All steel shall be placed and held securely 1½ inch from the face of the form to the center of the steel and shall be tied in such a manner as to preserve its alignment during the pouring of the concrete.

It is recommended that the side walls be poured before the placing of the concrete roof and provision for such type of construction has been made in the construction plans.

The finished inside walls shall be smooth and free from sharp burrs of concrete.

The conduits shall enter the structures at the locations indicated on the plans unless changes are specified by the owner. Porcelain conduit bells shall be installed as shown on the plans.

The walls shall be poured in one solid mass, the pouring of the concrete taking place in successive stages around the wall in order to avoid undue lateral pressure against any one section of the form. If it should become necessary to cease work before the walls have been brought to their finished height, precaution shall be exercised to provide dowels in order to assure a solid unit structure throughout.

All roof forms shall be substantially supported from the floor of the structure so that in the event that external loads are applied to the roof before completion of the 28 day set, the concrete roof will not be compelled to carry the entire load.

After the roof of manhole has become firm and hard, the manhole casting shall be set with at least 4 inches of concrete between the top of the roof and the base of the casting in such a way as to permit proper distribution of load from casting to the roof structure. All castings shall be set carefully by means of chalk lines from the adjacent, undisturbed edges of the existing paving, and shall be set approximately 1/16 inch higher than existing paving. Proper consideration shall be given to the curvature of the street when setting the castings, especially where the location of the manhole cover is such as to be involved with more than one street.

Backfill

Excavation above manholes shall be carefully backfilled with sand in such a manner as to assure a minimum amount of settlement over the manhole and in such a manner as to meet City Ordinances regarding this type of backfill. No backfilling shall take place until the concrete roof of the manhole has set sufficiently to permit backfilling without disturbance to the concrete structure.

Manhole Castings

All manhole castings will be furnished by Kansas Gas and Electric Company according to drawings included in the plans and shall be installed by the contractor.

Concrete

Concrete in manholes shall be mixed by volume of 1:2:4, using 1 inch or smaller coarse aggregate, requiring 6 sacks of cement per cu yd and acquiring minimum tested compressive strength of 3000 lb per sq in. in 28 days.

The concrete shall be thoroughly compacted by vibrating or by tamping and puddling.

All concrete shall be made with hard, well-graded aggregates and shall contain not more than 6 gal. of water for each sack of cement. It shall be of a plastic mix which can be placed without honeycombing or permitting excess water to accumulate on the surface.

Barricades

Each manhole shall be barricaded with a substantial guard rail and such barricade shall be maintained for at least 14 days in order to protect the structure from traffic.

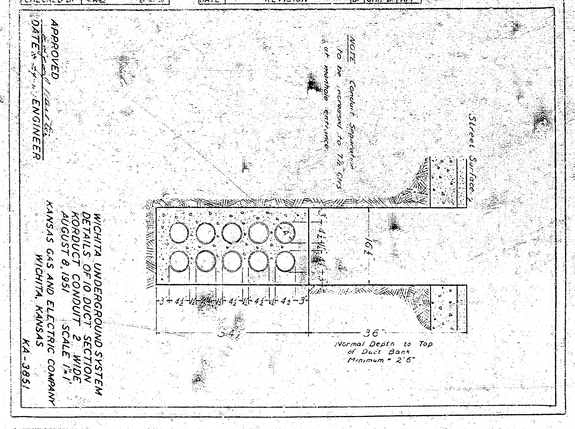
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TRACED BY			
CHECKED BY	C.W.J.		8-21-50

DATE	REVISION	BY	CHK'D	APP.

APPROVED C. V. Washington ENGINEER
DATE 8-24-50

WICHITA UNDERGROUND SYSTEM
DETAILS OF TD DUCT SECTION
KORDUCT CONDUIT SECTION
AUGUST 8, 1950 SCALE 1½"

KANSAS GAS AND ELECTRIC COMPANY
WICHITA, KANSAS
KA-3851



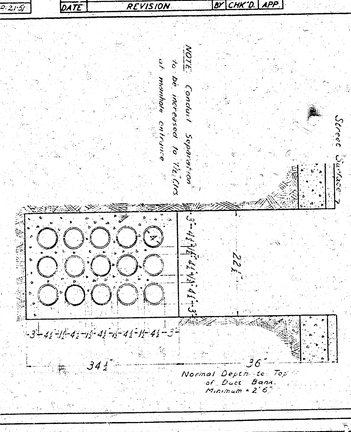
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CHECKED BY	C.W.J.		8-21-50

DATE	REVISION	BY	CHK'D	APP.

APPROVED C. V. Washington ENGINEER
DATE 8-24-50

WICHITA UNDERGROUND SYSTEM
DETAILS OF CONDUIT SECTION
KORDUCT CONDUIT SECTION
AUGUST 1, 1950 SCALE 1½" WIDE

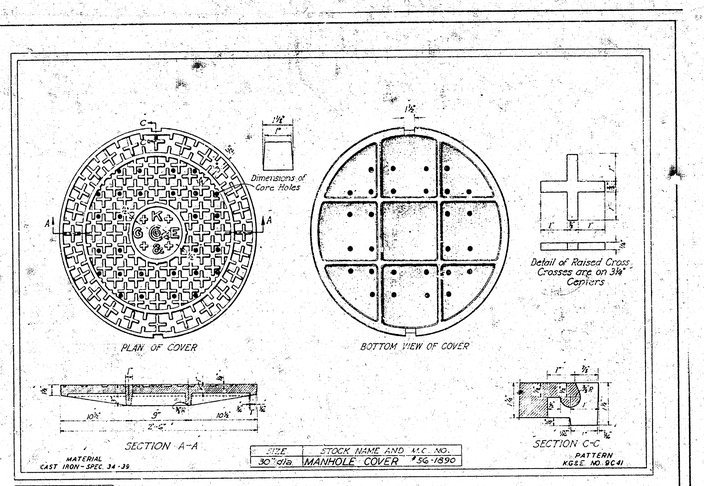
KANSAS GAS AND ELECTRIC COMPANY
WICHITA, KANSAS
KA-3850



KD 1726

DRAWN BY	C.W.J.		4-28-50
TRACED BY			5-3-50
CHECKED BY			5-5-50

DATE	REVISION	BY	CHK'D	APP.
9-5-50	Revised for Mfg. No.	C.W.J.		



SIZE	STOCK NAME AND M.C. NO.	PATTERN
30" dia	MANHOLE COVER #56-1890	KG&E NO. 9C41

MATERIAL
CAST IRON - SPEC. 34-39

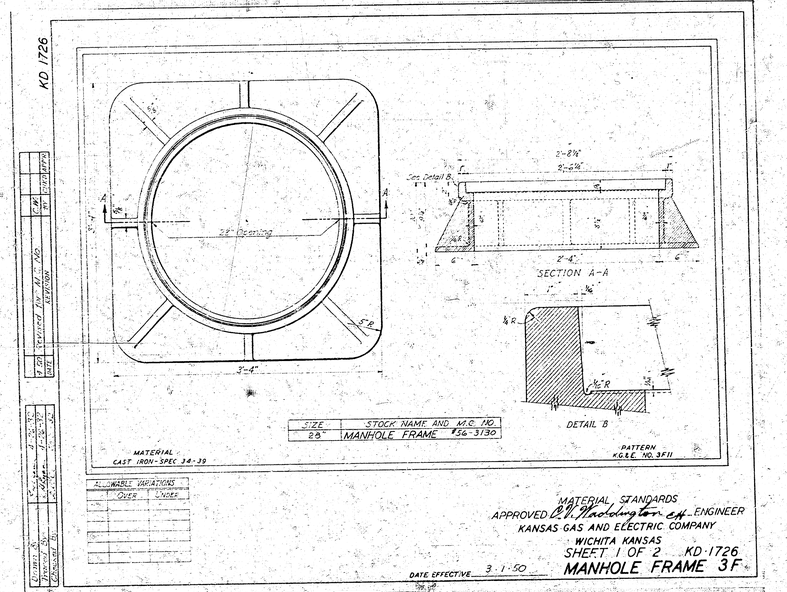
ALLOWABLE VARIATIONS	
Over	Under

MATERIAL STANDARDS
APPROVED C. V. Washington ENGINEER
KANSAS GAS AND ELECTRIC COMPANY
WICHITA KANSAS
SHEET 2 OF 2 KD-1726
DATE EFFECTIVE 3-1-50 MANHOLE COVER 9C

KD 1726

DRAWN BY	C.W.J.		4-28-50
TRACED BY			5-3-50
CHECKED BY			5-5-50

DATE	REVISION	BY	CHK'D	APP.
9-5-50	Revised for Mfg. No.	C.W.J.		



SIZE	STOCK NAME AND M.C. NO.	PATTERN
28"	MANHOLE FRAME #56-3130	KG&E NO. 3F11

MATERIAL
CAST IRON - SPEC. 34-39

ALLOWABLE VARIATIONS	
Over	Under

MATERIAL STANDARDS
APPROVED C. V. Washington ENGINEER
KANSAS GAS AND ELECTRIC COMPANY
WICHITA KANSAS
SHEET 1 OF 2 KD-1726
DATE EFFECTIVE 3-1-50 MANHOLE FRAME 3F

