ACTION

DATE

COMMITTEE _____ ____

M.A.P.C. Authorize Staff to Defer 1-7-60 1-21-60 prepare standard set of conditions for borrow pits

B.C.C./B. CO. C. _____ ____

MAPC Re. Vegetation & Slopes of borrow Pits - 1-7-60 + 1-21-60

DR59-26 - MEMO FROM G. H. WILTON, SUPT. PUBLIC WORKS MAINTENANCE, BORROW PIT CONTROL PROJECT.

# ACTION

| COMMITTEE | DATE |
| --- | --- |
| M.A.P.C. Authorize Dept. staff to prepare standard set of conditions for borrow pits | 1-7-60 1-21-60 |
| B.C.C./B. CO. C. | |

MAPC
Re. Vegetation & Slopes of Borrow Pits - 1-7-60 + 1-21-60

## CONDITIONS FOR SAND PITS

1. THE APPROPRIATE EXECUTION AND RECORDING OF A COVENANT RUNNING WITH THE LAND AS PREPARED AND AGREED TO BY CITY AND COUNTY COUNSEL DATED SEPTEMBER 28, 1959. (ENCLOSURE 1).

2. CONSTRUCTION SPECIFICATIONS FOR A LOOP LEVEE, SECTION 1 THROUGH 4 INCLUSIVE AND MAINTENANCE SPECIFICATIONS FOR THE LOOP LEVEE, SECTIONS 1 AND 2, OF CONSTRUCTION SPECIFICATIONS AS PREPARED BY THE MAINTENANCE DIVISION OF THE DEPARTMENT OF PUBLIC WORKS. (ENCLOSURE 2.) (APPLICABLE ONLY WHEN LOCATED ADJACENT TO OR NEAR BIG DITCH)

3. THE CONSTRUCTION OF A 58 INCH V-MESH WIRE FENCE ON 7 FOOT STEEL POSTS SPACED 16 FEET APART. SAID FENCE TO BE LOCATED OUTSIDE THE LOOP LEVEE REFERRED TO ABOVE.

4. THE SIDE SLOPE OF THE EXCAVATION SHALL BE NO MORE STEEP THAN 3 HORIZONTAL TO 1 VERTICAL AND IF THE LENGTH OF THE SLOPE IS GREATER THAN 10 FEET, A SLOPE 4 HORIZONTAL TO 1 VERTICAL SHALL BE REQUIRED.

5. VEGETATIVE COVER FOR SLOPES SHOULD CONSISTTOF A SHORT, PERENNIAL, DROUTH-RESISTANT GRASS OR COMBINATION OF GRASSES WHICH WILL PERMIT THE ESTABLISHMENT OF A GOOD SOD COVER; INSTALLATION AND COMPOSITION OF WHICH SHALL BE IN ACCORDANCE WITH SPECIFICATIONS OF THE SOIL CONSERVATION SERVICE.

6. EXCAVATION SHALL NOT APPROACH NEARER THAN 15 FEET TO THE PROPERTY LINE.

## TYPICAL CONDITIONS FOR BORROW PITS

1. The earth shall be extracted to a minimum depth of two (2) feet below the normal water table as determined by the City-County Health Department.

2. A fifty-eight (58) inch V-Mesh fence on no less than seven (7) foot steel posts with the posts at no more than sixteen (16) foot spacing shall be constructed on the property line and may provide for reasonable access gates installed at the height of the fence which gates shall be kept locked except when in use.

3. Excavation shall not approach nearer than 15 feet to the property line.

4. Along the boundaries facing residential areas there shall be installed a shelter belt consisting of two (2) rows of plantings and the installation and composition of said shelter belt shall be in accordance with specifications of the Soil Conservation Service.

5. That all fill taken from the subject borrow pit shall be used exclusively for the construction of Interstate Highway 235.

6. Construction specifications for a loop levee, Section 1 through 4 inclusive and maintenance specifications for the loop levee, Sections 1 and 2, of construction specifications as prepared by the Maintenance Division of the Department of Public Works. (Enclosure 2) (Applicable only when located adjacent to or near Big Ditch)

7. The side slope of the excavation shall be no more steep than 3 horizontal to 1 vertical and if the length of the slope is greater than 10 feet, a slope 4 horizontal to 1 vertical shall be required.

8. Vegetative cover for slopes should consist of a short, perennial, drouth-resistant grass or combination of grasses which will permit the establishment of a good sod cover; installation and composition of which shall be in accordance with specifications of the Soil Conservation Service.

9. The appropriate execution and recording of a covenant running with the land as prepared and agreed to by City and County counsel dated September 28, 1959. (Enclosure 1).

10. Conditions one through nine above shall be made subject of the performance bond presented by the contractor to the State Highway Commission, and a copy of said performance bond shall be filed with the City Clerk's office to ensure proper conformance to the conditions established in one through nine above.

11. A further separate bond shall be presented to cover separately and apart the maintenance of the shelter belt for such period of time and amount to be determined by the Board of Zoning Appeals. Such bond to be filed in the office of the City Clerk and to run in favor of the City.

SEPTEMBER 28, 1959

## COVENANT RUNNING WITH THE LAND

WHEREAS, THE UNDERSIGNED AS OWNER OF THE PROPERTY HEREINAFTER DESCRIBED HAS MADE APPLICATION TO THE METROPOLITAN PLANNING COMMISSION OF THE CITY OF WICHITA AND COUNTY OF SEDGWICK FOR PERMISSION TO USE SAID PROPERTY AS A BORROW OR SAND PIT TOGETHER WITH SUCH OTHER USES AS MAY BE NECESSARY TO CARRY ON A BORROW OR SAND PIT OPERATION ON SAID LAND; AND

WHEREAS, THE LANDS ADJACENT TO THE ABOVE DESCRIBED TRACT ARE AND WILL BE DEVELOPED FOR URBAN PURPOSES AND THE OPERATION OF A BORROW OR A SAND PIT AT SUCH LOCATION WILL ENDANGER THE HEALTH, WELFARE AND PROPERTY OF RESIDENTS WHO MAY LIVE IN SUCH AREAS UNLESS CERTAIN PROTECTIVE MEASURES ARE TAKEN; AND

WHEREAS, THE UNDERSIGNED DESIRES TO OBLIGATE HIMSEEF AND HIS SUCCESSORS IN TITLE TO PROTECT THE PUBLIC WELFARE BY CONSTRUCTING AND MAINTAINING A LOOP LEVEE UPON SAID PROPERTY AND TO SUBJECT AND BURDEN THE FEE TITLE THERETO SO THAT SUCH OBLIGATION IS A COVENANT RUNNING WITH THE LAND;

NOW THEREFORE, IN CONSIDERATION OF THE PREMISES AND THE ZONING BY THE METROPOLITAN PLANNING COMMISSION OF MY LAND HEREINAFTER DESCRIBED SO AS TO PERMIT THE USE THEREOF FOR BORROW AND/OR SAND PIT OPERATIONS, THE UNDERSIGNED HEREBY COVENANTS TO AND WITH THE METROPOLITAN PLANNING COMMISSION, THE BOARD OF COUNTY COMMISSIONERS OF SEDGWICK COUNTY AND CITY OF WICHITA, KANSAS, ON BEHALF OF HIMSELF AND HIS SUCCESSORS IN TITLE OF SAID LAND, TO CONSTRUCT OR CAUSE TO BE CONSTRUCTED AND MAINTAINED WITHOUT COST OR EXPENSE TO THE COUNTY OF SEDGWICK OR THE CITY OF WICHITA, A LOOP LEVEE ON, AROUND AND ENCLOSING ANY BORROW OR SAND PIT LOCATED ON THE FOLLOWING DESCRIBED LAND, TO-WIT:

(DESCRIPTION)

ALL IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS PREPARED BY THE CITY AND COUNTY ENGINEERS ATTACHED HERETO MARKED EXHIBIT "A" AND MADE A PART HEREOF;

TO SECURE AND GUARANTEE THE ABOVE OBLIGATION, THE UNDERSIGNED HEREBY SUBJECTS AND ENCUMBERS SAID PROPERTY WITH THE COVENANT AND OBLIGATION TO CONSTRUCT AND MAINTAIN SAID

LOOP LEVEE AS ABOVE DESCRIBED AS A COVENANT RUNNING WITH AND BURDENING THE LAND AND, IN EVENT OF THE FAILURE BY THE UNDERSIGNED OR ANY OF HIS SUCCESSORS IN TITLE WITHIN SIXTY (60) DAYS AFTER RECEIPT OF WRITTEN NOTICE FROM THE COUNTY OR CITY TO FULFILL THE OBLIGATION ABOVE SET FORTH, THEN AND IN SUCH EVENT THE BOARD OF COMMISSIONERS OF SEDGWICK COUNTY OR THE GOVERNING BODY OF THE CITY OF WICHITA MAY ORDER SUCH WORK DONE AND THEREAFTER MAINTAIN AND CHARGE THE ENTIRE COST OF SUCH CONSTRUCTION AND MAINTENANCE AS A FIRST LIEN AGAINST SAID LAND TO BE COLLECTED AND FORECLOSED IN THE SAME MANNER AS A MORTGAGE IS FORECLOSED.

THE UNDERSIGNED WARRANTS THAT HE IS THE OWNER OF THE FEE TITLE TO SAID TRACT OF LAND AND THAT THE OBLIGATION AND COVENANT ABOVE SET FORTH CONSTITUTES A FIRST AND PRIOR LIEN AGAINST AND ENCUMBERING SAID LAND.

THIS INSTRUMENT SHALL BE RECORDED IN THE OFFICE OF THE REGISTER OF DEEDS, SEDGWICK COUNTY, KANSAS, SO AS TO APPEAR IN THE CHAIN OF TITLE OF SAID LAND.

EXECUTED IN TRIPLICATE THIS_____DAY OF_____ 19___.

_____
(OWNER)

_____
(OWNER'S WIFE)

ACKNOWLEDGMENT

STATE OF KANSAS )
) SS:
SEDGWICK COUNTY )

BE IT REMEMBERED, THAT ON THIS_____DAY OF_____ 19___, BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC, IN AND FOR THE COUNTY AND STATE AFORESAID, CAME_____

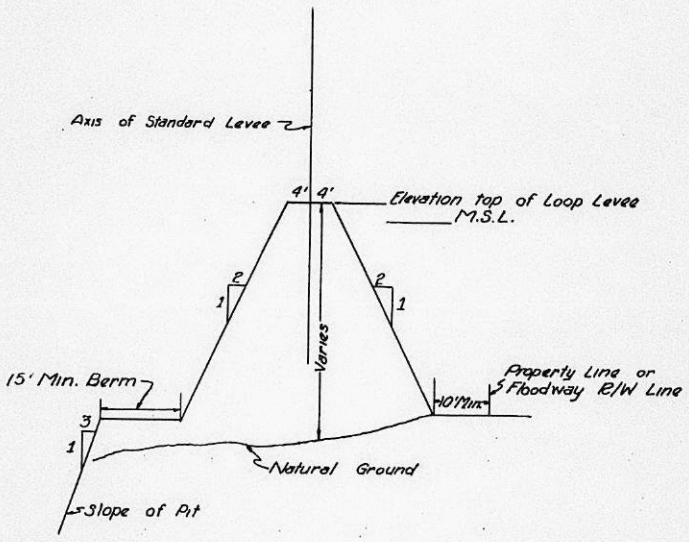
WHO ARE PERSONALLY KNOWN TO ME TO BE THE SAME PERSONS WHO EXECUTED THE WITHIN INSTRUMENT OF WRITING, AND SUCH PERSONS DULY ACKNOWLEDGED THE EXECUTION OF THE SAME.

IN TESTIMONY WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIRMED MY NOTARIAL SEAL, THE DAY AND YEAR LAST ABOVE WRITTEN.

_____
NOTARY PUBLIC

MY COMMISSION EXPIRES:

_____




No Scale

TYPICAL SECTION OF STANDARD LEVEE

CONSTRUCTION SPECIFICATIONS

SECTION I - CLEARING AND GRUBBING

1-01. ORDER OF WORK:

All clearing and grubbing as specified below will be done in advance of sub-grade preparation and levee embankment.

1-02. CLEARING: Operations shall consist of removal and disposal of trees, fallen timber, brush, logs, bushes, vines, stumps, drift wood, fences, heavy growth of crops, weeds and grass and other obstructions existing above ground level. Clearing will be done on the area beneath the levee embankment together with strips 10 feet wide beyond the embankment toe.

1-03. GRUBBING: Operations shall consist of thoroughly cleaning the area outlined in sub-paragraph 1-02 of all stumps, roots, buried logs and other matter which would be objectionable in the foundation of the levee.

SECTION II - EXCAVATION

An inspection trench 4 feet deep and 4 feet wide shall be excavated along the approximate center of the levee base.

SECTION III - EMBANKMENT

3-01. EMBANKMENT FOUNDATION PREPARATION: After clearing and grubbing of the embankment foundation and the excavation of the inspection trench has been completed, and immediately prior to the placement of embankment material, the entire earth surface on or against which fill is to be placed shall be thoroughly broken to a depth of six inches and the area to be occupied by the levee proper shall be compacted in accordance with the provisions of sub-paragraph 3-03. If for any cause this broken surface becomes compacted in such a manner that a plane of seepage or weakness might be induced, it shall again be thoroughly broken before the depositing of material thereon.

a. Drainage - The foundation receiving fill and the inspection ditch hereinbefore specified, and all partially completed fill shall be kept thoroughly drained.

b. Frozen Ground - No fill shall be placed upon frozen ground.

3-02. EMBANKMENT MATERIALS: The levee embankment shall be constructed of the most nearly impervious materials available from the construction site. Under no circumstances shall frozen earth, snow, or ice be placed in the levee. Embankment materials should be as homogeneous as possible and contain no foreign matter or pockets of soft unstable material.

3-03. EMBANKMENT CONSTRUCTION: Materials shall be placed or spread in layers not to exceed 12 inches in thickness prior to compaction. Layers shall be started full out to the toe of the embankment and shall be carried substantially horizontal with sufficient crown or slope to provide satisfactory drainage during construction. When the surface of any compacted layer is too smooth to bond properly with the suceeding layer, it shall be scarified before the suceeding layer is placed on it.

a. Moisture Control - It is the intent of these specifications to secure an embankment having the maximum density obtainable with natural moisture content of the embankment materials. However, if the material is too wet or too dry for proper compaction steps shall be taken to bring the moisture content back to near the optimum range. Wetting may be accomplished by wetting the borrow pit from which the embankment material is obtained or by distribution of sufficient moisture in each layer before rolling.

b. Rolling Operations - When moisture content and conditions of the spread layers are satisfactory, each layer shall be compacted by not less than four (4) complete passes of a tamper-type roller conforming to the requirements of sub-paragraph 3-03c,1, or by not less than two complete passes of a rubber-tired roller conforming to the requirements of sub-paragraph 3-03c,2. Portions of the embankment which the roller cannot reach for any reason must be compacted by other approved means to the density of the surrounding embankment.

c. Compaction Equipment -

1. Tamping Rollers - Tamping rollers shall consist of one or more units. Each unit shall consist of a cylindrical drum not less than 48 inches in length and not less than 48 inches in diameter. The drums shall be water or sand and water ballasted. Each drum shall have staggered feet uniformly spaced over the cylindrical surface such as to provide approximately three tamping feet for each two square feet of drum surface. The tamping feet shall be seven to nine inches in clear projection from the cylindrical surface of the roller and shall have a face area of not less than five nor more than seven square inches. The units shall be equipped with a suitable device for cleaning the feet. The rolling units of multiple-type tamping rollers shall be pivoted on the main frame in a manner which will permit the units to adapt themselves to uneven ground surfaces and to rotate independently. The weight of the roller shall be not less than 1,500 pounds per linear foot of drum length weighted, and shall be not more than 750 pounds per foot of drum length empty. The design and operation of the tamping roller shall be subject to the approval of the contracting officer who shall have the right at any time during the prosecution of the work to direct such

repairs to the tamping feet, minor alterations in the roller, and variations in the weight as may be found necessary to secure optimum compaction of the earth-fill materials. The roller shall be pulled by a crawler-type tractor of sufficient power to operate the roller at a speed of approximately 3-1/2 miles per hour.

2. Rubber-Tired Rollers - Rubber-tired rollers shall have a minimum of four wheels equipped with pneumatic tires. The tires shall be of such size and ply as to be capable of being operated at tire pressures between 80 and 100 pounds per square inch at a 25,000-pound wheel load. The roller wheels shall be located abreast and so designed that each wheel will carry approximately equal load in traversing uneven ground. The spacing of the wheels will be such that the distance between the nearest edges of adjacent tires will not be greater than 50 percent of the rated tire width of a single tire at the operating pressure for a 25,000-pound wheel load. The roller shall have a rigid steel frame provided with a body suitable for ballast loading such that the load per wheel may be varied, as directed by the contracting officer, from 18,000 to 25,000 pounds. The entire assembly (roller plus motivating equipment) must be capable of executing a 180-degree turn on a 15-foot radius. The roller shall be towed at speeds not to exceed ten miles per hour by pneumatic-tired equipment. The character and efficiency of this equipment shall be subject to the approval of the contracting officer.

d. Cross-Section of Levee Embankment - The levee embankment shall be constructed to conform with the requirements of typical standard levee section shown on Figure 1. Shrinkage and settlement allowances shall be allowed for by constructing the standard levee section plus a 5% addition in crest height.

## SECTION IV - TURFING

4-01. SCOPE: It is the intent of these specifications to obtain a good firm stand of native grass or grass which will insure the stability of the levee embankment. Good vegetative cover is of prime importance to the maintenance and operation of the levee embankment. The top, slopes and a 5 foot wide strip at the base of the levee on each side shall be turfed.

4-02. MULCHING:

a. Soil Preparation - If necessary the soil shall be loosened to a depth of 2 inches before application of the mulch material.

b. Materials - Hay shall be native prairie hay and a minimum of 50 percent by weight shall be 10 inches or more in length.

c. Application of Mulch - Mulch material shall be spread uniformly in a continuous blanket over the area to be mulched at the rate of approximately 3½ tons per acre. Mulch may be spread by hand or by mechanical means which do not break up the hay. Immediately following the spreading of the mulch material, it shall be anchored to the soil by pressing into the ground a minimum depth of 1½ inches, leaving enough material sticking upright to accomplish its primary purpose of temporary dust and erosion control. Anchoring shall be accomplished by using a mulch anchoring machine equipped with straight rolling Coulter-type discs that are spaced not more than 10 inches or less than 7 inches apart. The rolling discs shall be sufficiently dull to prevent cutting the mulch material. If anchoring machinery is not used, the mulch material shall be anchored with a spade at 6 inch intervals.

4-03. FERTILIZING AND SEEDING:

a. Materials -

1. Fertilizer shall be dry, free-flowing materials which can be distributed uniformly, and shall be commercial grade 10-10-0 or the equivalent.

2. Seed - Seed of mixed bluestem, switch grass, blue grama grass, side oats grama, sand dropseed grass, sand lovegrass, weeping lovegrass, or native bermuda grass, or a mixture of any or all of the above may be used.

b. Application - Fertilizer shall be applied uniformly at the approximate rate of 400 lbs per acre. Seed should be applied uniformly at the rate of approximately 30 lbs per acre.

# MAINTENANCE SPECIFICATIONS

## SECTION I - GENERAL

In general maintenance should provide for those things which will insure the serviceability of the levee in time of high water. Measures should be taken to promote the growth of sod, exterminate burrowing animals, provide for routine mowing, removal of wild growth and repair the damage caused by erosion. Another important maintenance responsibility is to insure the integrity of the loop levee at all times.

## SECTION II - INSPECTION

Periodic inspections should be made to insure that the above measures are being effectively carried out and to be certain that:

a. No unusual settlement, sloughing, or material loss of grade or levee cross section has taken place.

b. No caving has occurred on either the land side or the water side of the levee which might affect the stability of the levee section.

c. No seepage, saturated areas or sand boils are occurring.

d. No action is being taken, such as burning grass and weeds during inappropriate seasons, which will retard or destroy the growth of sod.

e. Access roads to and on the levee are being properly maintained.

f. Cattle guards and gates are in good condition.

g. Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained.

h. There is no damaging grazing or vehicular traffic on the levees.

i. Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

## TYPICAL CONDITIONS FOR BORROW PITS

1. THE EARTH SHALL BE EXTRACTED TO A MINIMUM DEPTH OF TWO (2) FEET BELOW THE NORMAL WATER TABLE AS DETERMINED BY THE CITY-COUNTY HEALTH DEPARTMENT.

2. A FIFTY-EIGHT (58) INCH V-MESH FENCE ON NO LESS THAN SEVEN (7) FOOT STEEL POSTS WITH THE POSTS AT NO MORE THAN SIXTEEN (16) FOOT SPACING SHALL BE CONSTRUCTED ON THE PROPERTY LINE AND MAY PROVIDE FOR REASONABLE ACCESS GATES INSTALLED AT THE HEIGHT OF THE FENCE WHICH GATES SHALL BE KEPT LOCKED EXCEPT WHEN IN USE.

3. EXCAVATION SHALL NOT APPROACH NEARER THAN 15 FEET TO THE PROPERTY LINE.

4. ALONG THE BOUNDARIES FACING RESIDENTIAL AREAS THERE SHALL BE INSTALLED A SHELTER BELT CONSISTING OF TWO (2) ROWS OF PLANTINGS; AND THE INSTALLATION AND COMPOSITION OF SAID SHELTER BELT SHALL BE IN ACCORDANCE WITH SPECIFICATIONS OF THE SOIL CONSERVATION SERVICE.

5. ALL FILL TAKEN FROM THE BORROW PIT SHALL BE USED EXCLUSIVELY FOR THE CONSTRUCTION OF INTERSTATE HIGHWAY 235.

6. A COVENANT RUNNING WITH THE LAND SHALL BE APPROPRIATELY EXECUTED AND RECORDED AND SHALL BE PREVIOUSLY APPROVED BY CITY COUNSEL. SAID RESTRICTIVE COVENANTS SHALL PROVIDE FOR THE CONSTRUCTION OF A LOOP LEVEE IN ACCORDANCE WITH CONSTRUCTION SPECIFICATIONS, SECTION 1 THROUGH 4 INCLUSIVE, AND MAINTENANCE SPECIFICATIONS, SECTIONS 1 AND 2, OF CONSTRUCTION AND MAINTENANCE SPECIFICATIONS AS PREPARED BY THE MAINTENANCE DIVISION OF THE DEPARTMENT OF PUBLIC WORKS; AND IN SUCH LOCATION AS THE SAID MAINTENANDE DIVISION OF THE DEPARTMENT OF PUELIC WORKS MAY DIRECT.

7. THE SIDE SLOPE OF THE EXCAVATION SHALL BE NO MORE STEEP THAN 3 HORIZONTAL TO 1 VERTICAL AND IF THE LENGTH OF THE SLOPE IS GREATER THAN 10 FEET, A SLOPE 4 HORIZONTAL TO 1 VERTICAL SHALL BE REQUIRED.

8. VEGETATIVE COVER FOR SLOPES SHOULD CONSIST OF A SHORT, PERENNIAL, DROUTH-RESISTANT GRASS OR COMBINATION OF GRASSES WHICH WILL PERMIT THE ESTABLISHMENT OF A GOOD SOD COVER.

9. CONDITIONS ONE THROUGH EIGHT ABOVE SHALL BE MADE SUBJECT OF THE PERFORMANCE BOND PRESENTED BY THE CONTRACTOR TO THE STATE HIGHWAY COMMISSION, AND A COPY OF SAID PERFORMANCE BOND SHALL BE FILED WITH THE (CITY,COUNTY) CLERK'S OFFICE TO ENSURE PROPER CONFORMANCE TO THE CONDITIONS ESTABLISHED IN ONE THROUGH NINE ABOVE.

10. A FURTHER SEPARATE BOND SHALL BE PRESENTED TO COVER SEPARATELY AND APART THE MAINTENANCE OF THE SHELTER BELT FOR THREE (3) YEARS AND IN THE AMOUNT OF FIVE HUNDRED DOLLARS ($500), SUCH BOND TO BE FILED IN THE OFFICE OF THE (CITY,COUNTY) CLERK AND TO RUN IN FAVOR OF THE (CITY,COUNTY).

## TYPICAL CONDITIONS FOR SAND PITS

1. A COVENANT RUNNING WITH THE LAND SHALL BE APPROPRIATELY EXECUTED AND RECORDED AND SHALL BE PREVIOUSLY APPROVED BY CITY COUNSEL. SAID RESTRICTIVE COVENANTS SHALL PROVIDE FOR THE CONSTRUCTION OF A LOOP LEVEE IN ACCORDANCE WITH CONSTRUCTION SPECIFICATIONS, SECTIONS 1 AND 2, OF CONSTRUCTION AND MAINTENANCE SPECIFICATIONS AS PREPARED BY THE MAINTENANDE DIVISION OF THE DEPARTMENT OF PUBLIC WORKS; AND IN SUCH LOCATION AS THE SAID MAINTENANDE DIVISION OF THE DEPARTMENT OF PUBLIC WORKS MAY DIRECT.

2. A FIFTY-EIGHT (58) INCH V-MESH FENCE ON NO LESS THAN SEVEN (7) FOOT STEEL POSTS WITH THE POSTS AT NO MORE THAN SIXTEEN (16) FOOT SPACING SHALL BE CONSTRUCTED ON THE PROPERTY LINE AND MAY PROVIDE FOR REASONABLE ACCESS GATES INSTALLED AT THE HEIGHT OF THE FENCE; WHICH GATES SHALL BE LOCKED EXCEPT WHEN IN USE; PROVIDED FURTHER THAT SUCH FENCE SHALL BE CONSTRUCTED OUTSIDE SUCH LOOP LEVEES AS MAY BE REQUESTED BY PARAGRAPH 1 OF THESE RESTRICTIONS.

3. THE SIDE SLOPE OF THE EXCAVATION SHALL BE NO MORE STEEP THAN 3 HORIZONTAL TO 1 VERTICAL AND IF THE LENGTH OF THE SLOPE IS GREATER THAN 10 FEET, A SLOPE 4 HORIZONTAL TO 1 VERTICAL SHALL BE REQUIRED.

4. VEGETATIVE COVER FOR SLOPES SHOULD CONSIST OF A SHORT, PERENNIAL, DROUTH-RESISTANT GRASS OR COMBINATION OF GRASSES WHICH WILL PERMIT THE ESTABLISHMENT OF A GOOD SOD COVER.

5. EXCAVATION SHALL NOT APPROACH NEARER THAN 15 FEET TO THE PROPERTY LINE.

**THE CITY OF WICHITA**

**OFFICE OF** Dept. of Public Works Maintenance **DATE** January 29, 1960

**TO** Mr. L. L. Little, Director of Planning

**FROM** G. H. Wilton, Supt. of Public Works Maintenance

**SUBJECT:** BZA-2-60

At your request, this office has reviewed possible effects of the proposed borrow pit on the operation and maintenance of the Big Slough-Cowskin Floodway. Following is a summary of the physical information available for this tract.

1. The logs of auger borings made by the Corps of Engineers prior to floodway construction show that the levee foundation material is sand with the ground water table found approximately 6 to 7 feet below the natural ground level.

2. In order to minimize the effects of underseepage and the possibility of levee failure due to sand boils, the Corps of Engineers overbuilt the top of left bank Levee 'D' to a minimum 68 foot top width.

3. The design flow line elevation of the floodway channel varies from 1303.0 at the north end of the tract to 1301.4 at the south end.

4. The design elevation of the top of left bank Levee 'D' varies from 1324.0 at the north end of the tract to 1322.6 at the south end.

5. Design water surface elevation inside the floodway levee varies from 1320.0 at the north end of the tract to 1318.6 at the south end.

6. Natural ground elevation of subject tract is approximately 1312.0.

7. The elevation of the proposed interstate highway embankment varies from approximately 1317.0 at the north end of the tract to 1314.0 at the south end of the tract and does not provide adequate protection to control seepage or the design water surface elevation in the event of levee failure due to sand boils.

Based on this information, we recommend that a loop levee be required around subject tract, the levee to be built to design water surface elevation. We suggest that the levee does not need to be constructed at the present time, but that a covenant be prepared as has been done for CU-16 and CU-24 to provide for its construction and maintenance at such a time as the project

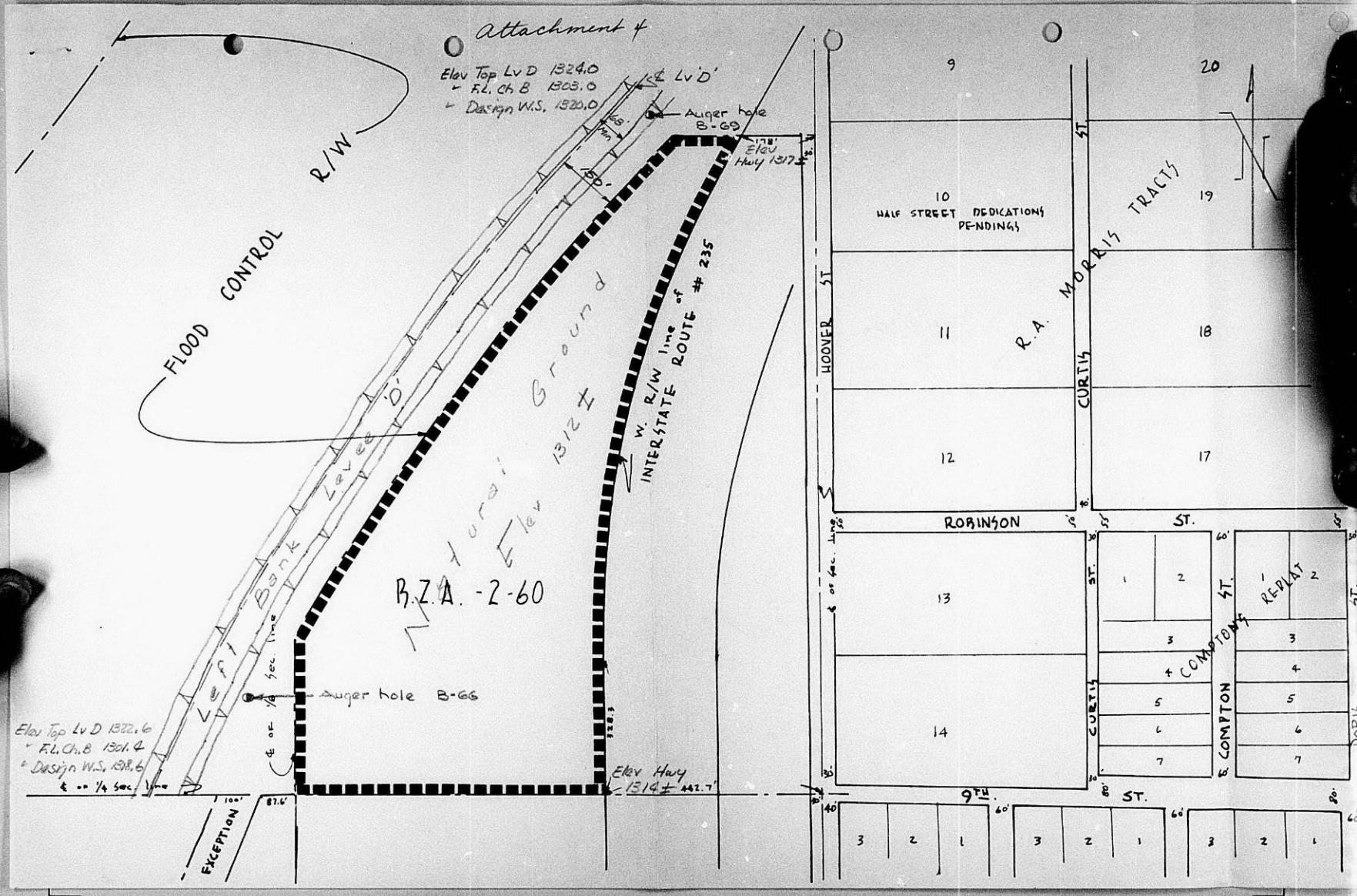
engineer determines that the levee needs to be constructed.

However, if the pit operator deems it more convenient to construct the loop levee as a part of the operation of the pit, then he should have that option.

The loop levee should be constructed and maintained in conformance with "Construction Specifications", "Maintenance Specifications" and "Typical Section of Standard Levee", previously furnished your office.

G. H. Wilton
Supt. of Public Works Maintenance

GHW:MSM:fb
Encl.
cc: M. S. Mitchell
File - Sand Pit Corresp.
" - Metro. Plan. Comm. Corresp.
" - Parcel 'B'


Attachment #
Elev Top Lv D 1324.0
F.L. Ch B 1303.0
Design W.S. 1320.0
℄ Lv'D'
Auger hole B-69
Elev Hwy 1317±
150'
FLOOD CONTROL R/W
Left Bank Levee 'D'
Natural Ground Elev 1312±
W. R/W line of INTERSTATE ROUTE # 235
B.Z.A. -2-60
Auger hole B-66
℄ of ¼ Sec. Line
Elev Top Lv D 1322.6
F.L. Ch.B 1301.4
Design W.S. 1318.6
Elev Hwy 1314± 442.7'
EXCEPTION
HOOVER ST.
CURTIS ST.
ROBINSON ST.
9TH ST.
COMPTON ST.
R.A. MORRIS TRACTS
HALF STREET DEDICATIONS PENDING
RE-PLAT
9
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JANUARY 27, 1960

MR. CLAY COX
COUNTY ZONING ADMINISTRATOR
SEDGWICK COUNTY COURT HOUSE
WICHITA, KANSAS

DEAR MR. COX:

RE DR59 26 - STANDARDS FOR BORROW PITS

THIS IS TO ADVISE YOU THAT AT ITS REGULAR MEETING OF JANUARY 21, 1960, THE PLANNING COMMISSION CONSIDERED YOUR PROPOSAL FOR ADDITIONAL CONSIDERATION IN REGARD TO VEGETATION ON THE SLOPES OF BORROW PITS. THE PLANNING COMMISSION INSTRUCTED THE PLANNING STAFF TO PREPARE A SET OF STANDARDS OF CONDITIONS TO BE IMPOSED FOR BORROW PITS; SUCH RECOMMENDATIONS TO BE PREPARED BY THE TIME THE NEXT CONDITIONAL USE APPLICATION FOR BORROW PITS IS PRESENTED TO THE PLANNING COMMISSION FOR ITS CONSIDERATION.

WE WILL WORK WITH THE MAINTENANCE DIVISION OF THE PUBLIC WORKS DEPARTMENT OF THE CITY OF WICHITA, THE COUNTY ENGINEER, AND YOUR OFFICE IN THE PREPARATION OF SUCH A STANDARD SET OF CONDITIONS.

MR. EICHER WILL CONTACT YOUR OFFICE AND THOSE INVOLVED IN THE NEAR FUTURE TO WORK ON THE PREPARATION OF THESE STANDARD CONDITIONS.

VERY TRULY YOURS,

LELAND R. EDMONDS
SENIOR PLANNER

LRE:RAL:BER

30.105

METROPOLITAN PLANNING JANUARY 14, 1960

DR 59-27

FRANK H. BACKSTROM, CITY MANAGER

L. L. LITTLE, DIRECTOR OF PLANNING

SAND AND GRAVEL EXTRACTION OPERATIONS

IN REVIEWING THE CITY'S ORDINANCES, I CONCUR THAT THERE IS NOTHING WHICH REGULATES SAND PIT OPERATIONS EITHER AS TO STANDARDS OF OPERATION OR AS TO LOCATION (EXCEPT BY INTERPRETATION). THE ONLY EXCEPTION TO THIS STATEMENT IS FOUND IN SECTION 21-23-9 OF THE ZONING ORDINANCE WHICH PROVIDES THAT:

> "THE BOARD OF COMMISSIONERS MAY, BY SPECIAL PERMIT AND SUBJECT TO SUCH PROTECTIVE RESTRICTIONS AS IT DEEMS NECESSARY, AUTHORIZE THE EXTRACTION OF GRAVEL OR SAND FROM EITHER OF THE RIVERS WITHIN THE CITY."

AN IMMEDIATE SURVEY SHOULD BE MADE TO DETERMINE WHERE AND TO WHAT EXTENT THE OPERATION OF SAND AND GRAVEL PITS IS BEING CONDUCTED. THE STUDY TO DETERMINE WHAT STANDARDS, SUCH AS DEPTH AND WIDTH OF PITS, AND WHAT OPERATIONS THERE ARE ADJACENT TO EXISTING PUBLIC RIGHTS-OF-WAY AND PRIVATE PROPERTY LINES. THIS SURVEY COULD THEN BE RELATED TO PROPOSED OR SCHEDULED IMPROVEMENT OF STREETS AND PUBLIC LANDS.

AN EXAMPLE SIMILAR IN NATURE TO THE PROBLEM IN THE KNIGHT SCHOOL AREA IS THE DOLESE SAND PIT IN THE AREA SOUTH OF 21ST STREET WEST OF AMIDON, WHERE PIT OPERATIONS ARE COMING CLOSE ENOUGH TO THE STREET RIGHT-OF-WAY LINE POSSIBLY TO PRECLUDE THE WIDENING OF 21ST STREET AND/OR THE EXTENSION OF AMIDON AVENUE TO THE SOUTH. AS YOU KNOW, THE COUNTY ZONING RESOLUTION ALLOWS SAND EXTRACTION AND BORROW PITS AS CONDITIONAL USES. THIS ALLOWS THE PLANNING COMMISSION TO RECOMMEND AND THE COUNTY COMMISSION TO IMPOSE STANDARDS OF OPERATION. ATTACHED IS A COPY OF THE STANDARDS WHICH HAVE BEEN ESTABLISHED, BASED ON RECOMMENDATIONS OF CITY AND COUNTY STAFF PERSONNEL FOR THE OPERATION OF SAND PITS.

ALSO ATTACHED IS A LIST OF STANDARDS FOR THE OPERATION OF BORROW PITS. IT MAY BE WELL TO CONSIDER THE ESTABLISHMENT OF ADDITIONAL STANDARDS FOR THE USE OF SAND PIT OPERATIONS WITHIN THE CITY IF ADDITIONAL SAFEGUARDS OF LIFE AND PROPERTY ARE NECESSARY.

IT IS RECOMMENDED THAT THIS MATTER BE FORWARDED TO THE PLANNING COMMISSION WITH A REQUEST TO CONSIDER THE ESTABLISHMENT OF CONDITIONAL USE PROVISIONS FOR SAND AND BORROW PITS WITHIN THE CITY ZONING ORDINANCE, OR OTHERWISE TO AMEND THE CITY ZONING ORDINANCE IN SUCH A WAY AS TO MAKE ADEQUATE PROVISIONS FOR THIS USE.

L. L. LITTLE
DIRECTOR OF PLANNING

LLL:BER
ATTACHMENT

**THE CITY OF WICHITA**

**OFFICE OF** Supt. of Public Works Maint. **DATE** December 23, 1959

**TO** Leland R. Edmonds, Senior Planner

**FROM** G. H. Wilton, Supt. of Public Works Maintenance

**SUBJECT** : Your memo of 12-17-59 re borrow pits.

As you may be aware, we have always considered that any slope should be protected by vegetation, be flat enough to permit easy mowing by standard mowing equipment and should have ample access room at the top of the slope. Our recommendations then, in answer to your request, are as follows:

1. Vegetative cover should consist of a short, perennial, drouth-resistant grass or combination of grasses which will permit the establishment of a good sod cover.

2. Slopes should be no steeper than 3 horizontal to 1 vertical and if the length of the slope is greater than 5 to 10 feet, a slope 4 horizontal to 1 vertical is preferred.

3. For good maintenance, it is absolutely necessary to have a level access berm at the top of the slope. We recommend that this berm be a minimum of 15 feet wide, unobstructed by trees, shrubs, fences, etc.

If further information is desired, please advise.

G. H. Wilton
Supt. of Public Works Maintenance

MSM:GHW:fb
cc: E. N. Smith
M. S. Mitchell
File - Metro. Plan. Corresp.

METROPOLITAN PLANNING DECEMBER 17, 1959

GEORGE WILTON, SUPERINTENDENT OF PUBLIC WORKS MAINTENANCE
LELAND R. EDMONDS, SENIOR PLANNER
BORROW PITS

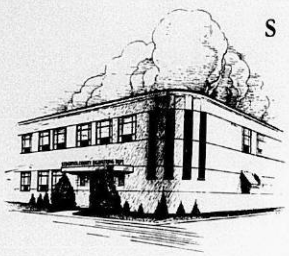
ATTACHED IS A COPY OF A LETTER FROM MR. CLAY COX, COUNTY ZONING ADMINISTRATION, IN WHICH HE SUGGESTS THAT ANOTHER CONDITION BE ADDED TO THE FUTURE APPROVAL OF BORROW PITS.

MAY WE PLEASE HAVE YOUR COMMENTS ON THIS MATTER.

SINCE THIS IS SCHEDULED TO COME BEFORE THE PLANNING COMMISSION ON JANUARY 7, 1960, WE WOULD APPRECIATE HAVING YOUR COMMENTS ON THIS MATTER BY AGENDA TIME (DECEMBER 31, 1959).

LELAND R. EDMONDS
SENIOR PLANNER

LRE:RAL:BER
cc: M. S. MITCHELL



# SEDGWICK COUNTY

WICHITA . KANSAS

OFFICE OF P. O. Box 2485
COUNTY ZONING ADMINISTRATOR
1015 STILLWELL

December 9, 1959

Mr. L. R. Edmonds
Metropolitan Area Planning Department
City Building Annex
104 South Main Street
Wichita, Kansas

Dear Lee:

During supervision of conditions placed on borrow pits, the possibility of adding another condition has come to our minds several times. This condition would require some type of vegetation around the slopes of the excavation. In the past, borrow pits have washed and eroded very badly. In most cases, the applicant has gone ahead on his own and planted vegetation to stop this deteriating process.

I am not aware of the actual advisibility of imposing such a condition. However, I thought the matter should be brought to your attention.

Sincerely yours,

Clay Cox
County Zoning Administrator

CC/jw

THE CITY OF WICHITA

OFFICE OF Public Works Maintenance DATE July 9, 1959

TO L. L. Little, Director of Planning

FROM G. H. Wilton, Supt. Public Works Maintenance

SUBJECT : Borrow or Sand Pits adjacent to the Flood Control Project

Reference is made to our discussions concerning open pits in the vicinity of the Flood Control Project. I am forwarding the following comments for your information:

1. An earthen levee is in danger whenever there is water against it.

2. The danger is in direct proportion to the height of the water, the duration of flood stage, and the intensity of either the current or wave action against the levee.

3. The danger is inversely proportional to the cross sectional area of the levee, the height of the levee, the degree of maintenance.

4. A well constructed levee should, if maintained and if not overtopped, hold throughout any major flood.

5. Levee foundation troubles can result in sand boils.

Before we define a sand boil, a few fundamental definitions and hydraulic facts should be understood:

1. Water is a liquid, it is only slightly compressible, and it always seeks its own level.

2. Water is heavy (62.4 pounds per cubic foot) and exerts head or energy dependent upon its height above a given datum plane.

3. Head can be expressed as elevation head (head due to height) and velocity head (head due to the Kinetic energy of moving water) which is equal to $V^2/2g$, where V equals the velocity of the fluid and g is the acceleration of any free falling body due to gravity.

4. Energy from velocity head and elevation head are interchangeable, thus 1 cubic foot of water falling one foot in elevation can produce 62.4 ft-lb of work and the Kinetic energy of a moving mass of water which equals $V^2/2g$ also has its units in ft-lbs. It can be shown that pressure in pounds per square inch and head in feet can be equated by the following constants:

$$h = 2.308\ p$$
$$p = 0.433\ h$$

The quantity of water moving through a channel, conduit or even the pores of soil (if steady flow conditions exist) is a function of the velocity of the water and the area of the conduit and is written $Q = Av$ where Q is the quantity (usually cubic feet per second), A is the cross sectional area in sq. ft., and v is the average speed or velocity of the water in ft. per second. In the case of an open pit landside of the floodway system, head, h, would be the difference between elevation of the water in the floodway and the water in the pit. The horizontal distance between the water in the floodway and the water in the pit is L and h/L equals the hydraulic gradient, i. Both Q and V are linear functions of i.

If the soil is homogeneous and rather densely compacted, the velocity will be relatively low so that the value of the velocity head ($V^2/2g$) is insignificant and for all practical purposes, the energy gradient coincides with the hydraulic gradient. The hydraulic gradient then defines the limit of pressure available to maintain flow through the soil toward the pit. More simply stated it could be said that the difference in water surface elevation of the pit and the floodway controls the amount of pressure available to cause the water to flow through the soil between the two. The difference in head between the water in the floodway and the water in the pit represents a loss of head due to the resistance to flow offered by the soil particles. Thus, each soil particle which offers resistance must be subjected to pressure by the water as the water attempts to flow to the lower level. Pressure exerted on the particles is equal to the head loss and is applied in the direction the water if flowing.

If we consider a point just landside of the landside toe of a pervious or semi-pervious embankment such as a levee, model tests show that the direction of flow of the water which is passing through the embankment will tend to be upward. Should the pressure on the soil particles, exerted by this upward flow, equal the gravitational force (weight) of the submerged soil, the soil particles would be at the point of flotation, and any slight addition to the dynamic force of the flowing

water would cause them to move upward. This condition is critical and occurs most often when the hydraulic gradient approaches unity. If a critical area exists, it will always be at the point of emergence, since the particles have a path of free escape and since the direction of water pressure is always steepest in this region.

Beginning at the surface and progressively working deeper, there will be a tendency for the flow to remove the soil particles whose grain size is equal to, or less than, o.ol millimeters. What happens after emergence occurs in any particular situation is beyond the limits of generalization. The structure of the soil might be such that there would be a rearrangement of the larger soil particles, in which case the pores would become enlarged, the pressure would lessen, and the removal of soil particles might be halted. Or, continuous removal of particles may cause the collapse of the soil mass which would again reduce the pore size, increase the flow pressure, and regenerate the removal process. This is the condition which is called a sand boil and which might result in levee failure. If, however, a pool is formed (as in a typical spring) to dissipate the pressure and permit the soil particles to drop back into the water without being carried away, the boil may continue indefinitely without causing structural failure. This is the method used to stop the damaging effects of a sand boil, that is to form a sand bag ring, or levee, around the boil of sufficient height to cause

the water to rise high enough in the ring to reverse the pressure -- gravity ratio so that the particles fall back into the water and are not carried away from the boil.
The effect of a toe drain system on a typical levee embankment is to draw the lines of flow into the filter material which is porous enough to permit the water to escape without carrying soil particles with it.

It can be seen from this discussion that many factors influence the forming of a sand boil, and that even if a boil is prevented, the flow of water through porous soil is certain. Relating these facts to the case of open pits adjacent to the floodway, we see that the rate of rise in the water surface of the pit will be governed by the amount of head differential between the two water surfaces, the density of the soil between the two and the horizontal distance between the two. This rise in the pit water surface presents the possibility that the pit might overflow causing flooding without ever endangering the stability of the levee embankment. Of the two possibilities, embankment failure would be the most disasterous; however, it is the less certain to occur and more difficult to remedy. Pit rises are less likely to cause the damage that a quick outbreak of floodwaters thru a breach in the levee would; however, if the pit were to overflow and to cause flooding it would be small reward indeed to know that the levee embankment was still structurally sound. In all

probability, continuous rise and fall of water between the pit and the floodway would have some adverse effect on the foundation material.

We would also like to review recent and past history of the sand or borrow pit problem:

During my appearance before the Commission on June 22, 1959, I pointed out that the matter of open pits adjacent to the floodway system had been investigated a few years ago, after the City and County received a request from the Corps of Engineers to control sand pits adjacent to the floodway project. The only recourse open to the City and County was to file injunctions to prevent operation of sand pits in the vicinity of the project, and in order to obtain a permanent injunction, it would be necessary to show that pit operations would endanger the stability of the Project Levees and in that way could cause damage to both public and private property. In order to prove this, testimony from experts in soils and hydraulics would be required. Since the only source of these experts was the Corps of Engineers, we addressed a letter to the Corps requesting that they establish a safe limit outside of which sand pit operations would have no adverse effects upon the flood control project. We were advised that the distance would vary considerably, dependent upon the soil conditions, height of flood above ground level, and duration of flooding.

It was the opinion of the City and County attorneys that since definite proof could not be shown that the operation of sand

pits at any particular location would, or would not, be a hazard to the safe operation of the Flood Control Project; further study of the matter should be deferred.

With construction of interstate route 235, the demand for fill material is, of course, quite pressing. We are in a position where the restriction of borrow operations within the vicinity of the highway may result in increased costs of construction to the State and Federal Governments, and perhaps to the City of Wichita. This office, of course, cannot neglect its primary responsibility of protecting the flood control project.

I also informed the Planning Commission that the only solution this office could offer at the present time to the problem of protecting the floodway system and lands adjacent to open pits was to propose the construction of a loop levee which would completely encircle the open pit or pits. Loop levees would protect against pit overflow and would also provide protection in case of levee failure. Since there is some element of doubt as to whether or not seepage into the pit from the Flood Control Project will occur, and that the water surface will raise to a sufficient height to discharge out of the pit, the Planning Commission may not want to require construction of a loop levee by the property owner or sand pit operator. In that case, it is suggested that sufficient land within the property on which the borrow rights will

be permitted be retained for construction of a loop levee at a later date should seepage warrant.

G.R. Wilton, Supt.
Public Works Maintenance

GRW:jag
Enc.
cc: M.S. Mitchell
cc: Interstate Highway

APPROVED BY:

E. N. Smith
Director of Public Works