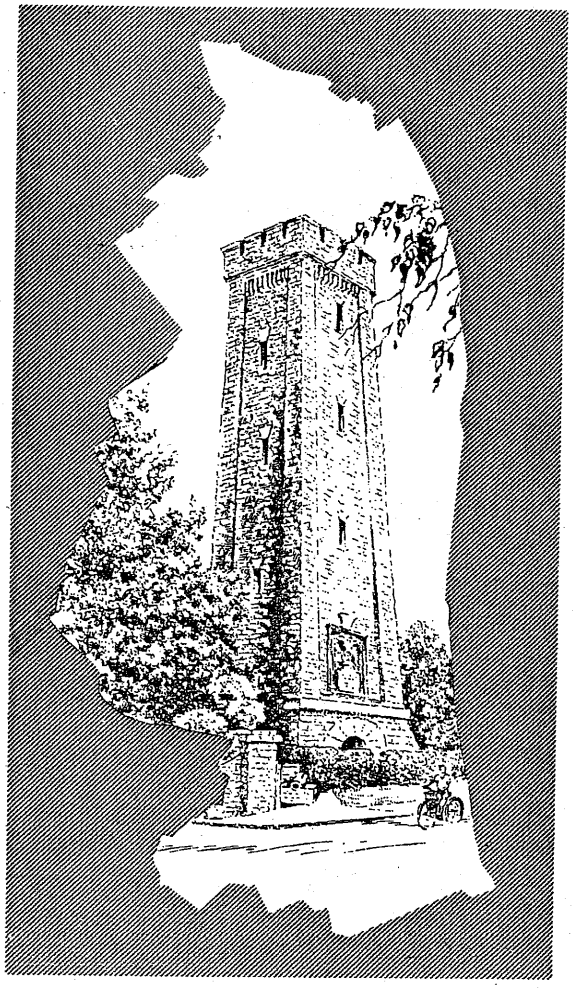
OFFICIAL SUBDIVISION REGULATIONS



CITY OF FORT THOMAS, KENTUCKY

RON DILL

BUILDING SERVICES

OFFICIAL SUBDIVISION REGULATIONS

CITY OF FORT THOMAS

COMMONWEALTH OF KENTUCKY

MAY, 1990

CITY OF FORT THOMAS

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FORT THOMAS SUBDIVISION REGULATIONS

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ARTICLE I

APPLICATION AND AUTHORITY OF REGULATIONS

REGULATIONS FOR ESTABLISHING SUBDIVISION PROCEDURES FOR THE SUBMISSION AND APPROVAL OF THE PRELIMINARY AND FINAL PLATS AND RECORDING OF FINAL PLATS; DESIGN STANDARDS AND PRINCIPLES FOR THE LAYOUT OF SUBDIVISIONS AND FOR THE SURVEYING AND PLATTING REQUIREMENTS THEREOF; REQUIRING THE INSTALLATION OF CERTAIN IMPROVEMENTS AND PROVIDING FOR THE NECESSARY CONSTRUCTION AGREEMENTS AND GUARANTEES THEREIN; PROVIDING FOR CERTAIN PRELIMINARY AND FINAL PLAT REQUIREMENTS; DEFINING CERTAIN TERMS USED HEREIN; PROVIDING FOR THE METHOD OF ADMINISTRATION AND ENFORCEMENT AND THE PENALTIES FOR VIOLATION THEREOF; PROVIDING FOR THE MEANS OF ADOPTION AND AMENDMENT; REPEALING ALL REGULATIONS, RESOLUTIONS, ORDERS, ORDINANCES AND/OR CODES IN CONFLICT HEREWITH.

SECTION 1.0 SHORT TITLE: Those regulations shall be known and may be cited as the "Subdivision Regulations" of the City of Fort Thomas, State of Kentucky.

SECTION 1.1 PURPOSE AND AUTHORITY:

A. PURPOSE: These Subdivision Regulations as herein set forth, have been prepared in accordance with the adopted comprehensive plan for Fort Thomas, to promote the public health, safety, morals and general welfare of the county; to provide for the proper arrangement of streets in relation to existing or proposed streets; to provide for adequate and convenient open spaces for vehicular and pedestrian traffic, utilities,

cess of fire fighting apparatus, recreation, light and air, and the avoidance of congestion of the population, and to facilitate the orderly and efficient layout and appropriate use of the land. In addition, these regulations also provide for the accurate surveying of land, preparing and recording of plats and the equitable handling of all subdivision plats by providing uniform procedures and standards for observance by both the approving authority and subdividers.

B. AUTHORITY: These regulations are adopted in accordance with the Kentucky Revised Statutes - Chapter 100.111 - 100.991.

SECTION 1.2 SCHEDULE OF CONSTRUCTION AND SALE OF LOTS: No lot, tract, or parcel in a subdivision may be sold or transferred unless a Final Plat has been approved by the Planning Commission, signed by the chairman of the commission, and recorded with the Campbell County Clerk.

SECTION 1.3 SCHEDULE OF IMPROVEMENTS: The subdivider of any tract or parcel of land located within Fort Thomas shall not proceed with the construction of any improvements until he has obtained: (1) approval or conditional approval of the preliminary plat; (2) approval or approval subject to conditions, of the improvement drawings and specifications; or (3) final plat approval. Preliminary grading of the site may proceed following approval or conditional approval of the preliminary plat, providing that plans for erosion and sedimentation are submitted to the City Engineer for approval or approval subject to conditions.

SECTION 1.4 GENERAL RESPONSIBILITIES:

A. SUBDIVIDER: The subdivider shall: use a land surveyor and engineer, as defined herein, to prepare plats and plans consistent with the design standards; accomplish improvements consistent with the improvement requirements; and submit said plats and plans in accordance with these regulations.

B. PLANNING COMMISSION: The Planning Commission, or its support staff, is charged with the duty of making investigations and reports on the design and improvements of proposed subdivisions, and requiring conformance of such subdivisions with the Kentucky Revised Statutes, Chapter 100, and these regulations.

ARTICLE II

DEFINITIONS

SECTION 2.0 WORDS AND PHRASES: For the purpose of these regulations, certain terms, phrases, words, and their derivatives, are herewith defined as follows:

Words used in the future tense include the present;

Words used in the present tense include the future;

Words used in the singular form include the plural;

Words used in the plural form include the singular;

Words used in the masculine include the feminine;

Words used in the feminine include the masculine;

The word "shall" is mandatory;

The words "may" and "should" are permissive.

ACCESS POINT: An access point is:

(1) A driveway, a local street, a collector street, or subcollector street, intersecting an arterial street;

(2) A driveway or a local street intersecting a collector street or subcollector street; or

(3) A driveway or a local street intersecting a local street.

AGRICULTURE: The use of land for agricultural purposes, including agriculture, dairying, farming, floriculture, horticulture, pasturage, viticulture, and animal and poultry husbandry and the necessary accessory uses for packing, treating, or storing the produce; provided, however, that the operation of any such accessory use shall be secondary to that of the normal agricultural activities.

ALLEY: Public right-of-way which normally affords a secondary means of access to abutting property.

BLOCK: A parcel of land within a subdivision that is bounded by streets or bounded by streets and the exterior boundary of the subdivision. For this definition, an alley is not considered a street, but part of the block.

BLOCK LENGTH: The distance between intersections of through streets, such distance being measured parallel to the longest street bounding the block and from right of way line to right of way line of the two intersecting streets.

CERTIFICATE OF OCCUPANCY: A certificate which must be obtained prior to occupancy of any premises.

CITY INSPECTOR: A person employed by the legislative body or the planning commission, whose responsibility it is to inspect items required by these regulations.

COMMISSION (OR PLANNING COMMISSION, OR PLANNING AND ZONING COMMISSION): The Fort Thomas Planning and Zoning Commission, Commonwealth of Kentucky.

COMPREHENSIVE PLAN: The comprehensive plan for Fort Thomas, adopted by the Fort Thomas Planning and Zoning Commission. It is a guide for public and private actions and decisions to assure the development of public and private property in the most appropriate relationships. It shall contain as a minimum, the following elements:

A. a statement of goals and objectives, principles, policies and standards;

B. a land use plan element;

C. a transportation plan element;

D. a community facilities plan element;

E. may include any additional elements, such as, without being limited to: community renewal, housing, flood control, pollution, conservation, natural resources, and others.

DEVELOPER: Synonymous with term "subdivider".

DULY AUTHORIZED REPRESENTATIVE: The Fort Thomas City Staff shall serve as the duly authorized representative for the Fort Thomas Planning and Zoning Commission and shall be authorized to check, review, and approve, where provided in these regulations, all submissions regarding their conformance to these regulations.

EASEMENT: A right, distinct from the ownership by fee simple title of the land, to cross property with facilities such as, but not limited to, sewer lines, water lines, and transmission lines, or the right, distinct from the fee simple title ownership of the land, to reserve and hold an area for drainage or access purposes.

ENGINEER: A qualified registered professional engineer in good standing with the Kentucky Board of Registration for Professional Engineers and Land Surveyors.

FINAL PLAT: A subdivision plat proposed in accordance with the provisions herein in which said plat is designated to be placed on record with the county clerk after approval by the planning commission.

FLOOD: A general and temporary condition of partial or complete inundation of normally dry land areas from: (a) the overflow of inland waters; (b) the unusual and rapid accumulation of runoff of surface waters from any source; and (c) mudslides (i.e., mudflows) which are caused or precipitated by accumulations of water on or under the ground.

FLOOD - 100 YEAR FREQUENCY: The highest level of flooding that, on the average, is likely to occur once every 100 years or has a 1% chance of occurring in any given year.

FLOOD PLAIN OR FLOOD PRONE AREA: Any normally dry land area that is susceptible to being inundated by water from any source.

FLOODWAY: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the 100-year flood without cumulatively increasing the water surface elevation more than one foot at any point.

FLOODWAY ENCROACHMENT LINES: The lines marking the limits of floodways on the official zoning map.

FRONTAGE LOT: All the property abutting on one side of the right-of-way of a street, measured along the right-of-way line of the street between the intersecting lot lines. In no case shall the line along an alley be considered as acceptable for frontage.

FRONT YARD DEPTH: The minimum distance required to be maintained within the lot

between a line parallel to the front lot line, as defined herein, and the front lot line.

IMPROVEMENT PLANS: The engineering plans showing types of materials and construction details for the physical structures and facilities to be installed in, or in conjunction with, the subdivision.

LOT: A parcel of land or any combination of several lots of record, occupied or intended to be occupied by a principal building or a building group as permitted under the Fort Thomas Official Zoning Ordinance, together with their accessory buildings or uses and such access, yards, and other open spaces required under those zoning ordinances.

LOT OF RECORD: A designated fractional part of a subdivision according to a specific recorded plat or survey, the map of which has been officially approved by the planning commission and recorded in the office of the county clerk.

LOT AREA: The total area of a horizontal plane bounded by the front, side, and rear lot lines, but not including any area occupied by street, alley, or railroad rights-of-way, as opposed to an easement, and shall be in one zone only.

LOT, CORNER: A corner lot is a lot situated at the intersection of two streets or on a curved street on which the interior angle of such intersection or curved street does not exceed one hundred thirty five (135) degrees.

LOT, DEPTH OF: The distance measured in the mean direction of the side lot lines from the midpoint of the front lot lines to the midpoint of the rear lot lines.

LOT, DOUBLE FRONTAGE: A lot other than a corner lot that has frontage on more than one street.

LOT, FLAG: A lot which abuts a public street via a narrow strip of land, which connects that portion of the lot containing the required lot width to the public right-of-way. Said lot shall have a minimum of (25) feet fronting on a dedicated public right-of-way.

LOT, INTERIOR: A lot other than a corner lot with only one frontage on a deeded and improved public right-of-way.

LOT LINE, FRONT: The common boundary line of a lot and a street right-of-way line. In the case of a corner lot or a double frontage lot, the common boundary line and that street right-of-way line toward which the principal or usual entrance to the main building faces.

LOT LINE, REAR: The boundary line of a lot which is most nearly opposite the front lot line of such lot. In the case of a triangular or wedge shaped lot, for measurement purposes only, a line ten (10) feet in length within the lot parallel to and at the maximum distance from the front lot line. In the case of a corner lot, providing that all requirements for yard space are complied with, the owner may choose either side not abutting a street as the rear lot line, even though it is not opposite the front lot line. Once the choice has been made, it cannot be changed unless all requirements for yard space can be complied with.

LOT LINE, SIDE: Any boundary line of a lot, other than a front lot line or rear

lot line.

LOT WIDTH: The width of the lot as measured along the building front setback line.

OFFICIAL MAP: The adopted official map of the City of Fort Thomas, as provided for in the Kentucky Revised Statutes, Chapter 100.

PRELIMINARY PLAT: A tentative plat of a proposed subdivision prepared in accordance with the provisions herein for presentation to the planning commission for its action.

RESUBDIVISION: A subdivision which is actually a resubdivision of a previously recorded plat, representing a revision of the old lots, but where no new improvements are to be constructed or extended.

RIGHT-OF-WAY: A general term denoting land, property, or interest therein, usually in a strip and dedicated for or devoted to such uses as a street, alley, or railroad.

STREETS: any vehicular ways except alleys.

A. All streets will be within dedicated rights-of-way which have been properly processed, approved and recorded.

B. The following shall be used to classify all streets:

STREET, PRIVATE: A paved private roadway which affords access to abutting property for private users of such property, and that has not been accepted for ownership by the City. As such, the property owners of mutual benefit are responsible for maintenance of said street. For the purposes of density calculations, a private street shall constitute the areas of its paved surface and sidewalks or the private right-of-way if designated on the recorded plat.

STREET, PUBLIC: A public roadway, constructed within the boundaries of an officially dedicated public right-of-way, which affords principal means of access to abutting property. For purposes of density calculations, a public street shall constitute all of the area within the public right-of-way.

STREET, ARTERIAL: Public thoroughfares which serve the major movements of traffic within and through the community.

STREET, COLLECTOR: Public thoroughfares which serve to collect and distribute traffic primarily from subcollector to arterial streets.

STREET, CUL-DE-SAC OR COURT: A street having an outlet at one end only and having the other end permanently closed with facilities permitting vehicles to turn around.

STREET, DEAD-END: A street having an outlet at one end only and terminated at the other end by undeveloped property. It may or may not have facilities permitting vehicles to turn around.

STREET, EXPRESSWAY: A divided arterial highway for through traffic with full

or partial control of access and generally with grade separations at major intersections.

STREET, FREEWAY: A divided multi-line highway for through traffic with all crossroads separated in grades and with full control of access.

STREET, FRONTAGE ROAD (SERVICE OR ACCESS ROAD): A street adjacent to a freeway, expressway, or arterial street separated therefrom by a dividing strip and providing access to abutting properties.

STREET, LOCAL: Roadways which are designed to be used primarily for direct access to abutting properties.

STREET, SUBCOLLECTOR: A street designed to provide a traffic route from local to collector streets.

SUBDIVIDER: Any individual, firm, association, syndicate, co-partnership, corporation, trust, governmental agency or any other legal entity commencing proceedings under these regulations, to create a subdivision of land as defined herein for himself or for another.

SUBDIVISION: The division of a parcel of land into two or more lots or parcels or tracts for the purpose, whether immediate or future, of sale, lease of building development, or if a new street is involved, any division of a parcel of land; providing that a division of land for agricultural purposes into lots or parcels of five acres or more and not involving a new street shall not be deemed a subdivision. The term includes resubdivision and when appropriate to

the context shall relate to the process of subdivision or to the land subdivided.

SURVEYOR: A qualified registered land surveyor in good standing with the Kentucky Board of Registration.

TRACT: A parcel of land identified by letter or number, the boundaries of which are shown on the recorded subdivision plat.

ARTICLE III

SUBDIVISION PROCEDURE

Any person desiring to subdivide any lot, tract or parcel of land within Fort Thomas, shall comply with the procedures established in this article and other applicable articles and sections of these regulations and in the sequence specified.

SECTION 3.0 PRELIMINARY INFORMATION: The subdivider is required to notify the planning commission, or its duly authorized representative, of his intention to subdivide a property prior to submission of the preliminary plat. Such notification shall be made to the Planning Commission at a regularly scheduled meeting at least one month prior to the requested public hearing for the subdivision. At this time, the following material shall also be submitted.

A. APPLICATION FOR PRELIMINARY PLAT APPROVAL:

An application (provided by the commission) shall be submitted. At the time of submission, the City official, shall indicate on the application the date of submission and signature of the City official.

B. PRELIMINARY PLAT FEES:

Preliminary plat fees shall be submitted in accordance with Article

VIII, Section 8.1 of these regulations.

SECTION 3.1 SUBMISSION OF PRELIMINARY PLAT: The subdivider shall file five (5) copies of the Preliminary Plat to the Zoning Administrator, prepared in accordance with the requirements of Article IV, at least twenty-one (21) consecutive days prior to the next regular meeting of the planning commission. At this time, the following material shall also be filed where applicable.

A. INDIVIDUAL ON-SITE DISPOSAL SYSTEM PERMIT:

Where individual on site disposal systems have been approved, as per Section 7.1 (d) of these regulations, a copy of the permit to use on-site disposal systems, approved by the Department of Housing, Buildings, and Construction - Division of Plumbing, shall be required.

B. EROSION AND SEDIMENTATION CONTROL PLANS:

In the event the subdivider elects to proceed with grading, following preliminary plat approval, or conditional approval, but prior to the submission of improvement drawings and specifications, two (2) copies of plans for the grading and control of erosion and sedimentation (as per Section 7.12) must also be submitted to the planning commission for review and approval.

SECTION 3.2 PROCESSING OF PRELIMINARY PLAT: The applicant shall be required to notify the local and state governmental agencies, and other organizations

of the public meeting and shall submit to them copies of the proposed preliminary plat.

The local and state governmental agencies and other affected organizations shall forward their recommendations and/or comments, if any, to the planning commission prior to or at the meeting of the planning commission at which the issue will be heard.

The preliminary plat, the application, and all other required information, shall be checked by the planning commission for compliance with: (1) the requirements of the preliminary plat as per Article IV; (2) the requirements of the applicable zoning ordinance; and (3) any other pertinent sections of applicable regulations.

SECTION 3.3 PLANNING COMMISSION ACTION: The City staff shall review the Preliminary Plat, including determination of its conformance to the requirements of these regulations, and shall consider the recommendations and/or comments of all applicable state governmental agencies and other applicable organizations, and shall forward such recommendations and/or comments to the planning commission along with its recommendations and/or comments. The planning commission shall then review the recommendations and take one of the following actions: (1) approve the plat; (2) approve the plat, subject to conditions; or (3) disapprove the plat; within two consecutive regularly scheduled meetings from date of official filing, unless such time is extended by agreement between the planning commission and the subdivider. Approval of the preliminary plat by the commission does not constitute final approval of the subdivision, but is merely an authorization to proceed with the prepara-

tion of the improvement drawings and specifications and the Final Plat.

In the event of conditional approval or disapproval of the preliminary plat, a statement, in writing, by the planning commission, setting forth the conditions of approval, or reasons for disapproval, shall be submitted to the subdivider.

Approval or conditional approval of a preliminary plat shall be valid and not subject to additional requirements for a period of twelve (12) consecutive calendar months, except that if a portion of an approved preliminary plat is approved or conditionally approved as a Final Plat, said approval or conditional approval of the remainder of the preliminary plat shall be valid for eighteen (18) consecutive calendar months after the date of approval or conditional approval of said final plat (as provided for in Section 3.7). The planning commission may, upon receipt of a request by the subdivider, grant an extension not to exceed one (1) year to this twelve (12) month period if prevailing conditions have not changed appreciably.

SECTION 3.4 SUBMISSION AND PROCESSING OF PRELIMINARY GRADING PLANS: Following approval or conditional approval of the preliminary plat, the subdivider may elect to proceed with preliminary grading of the area to be subdivided, provided that grading plans with provisions for control of erosion and sedimentation (as per Section 7.12) are submitted to the City Staff who shall check the proposed grading and erosion and sedimentation control plans to ensure their conformance with the approved or conditionally approved preliminary plat and that they meet the requirements established in Article VII and other pertinent sections of these regulations. Following this review, the

staff shall take one of the following actions: (1) approve the erosion and sedimentation plans for preliminary grading; (2) approve the erosion and sedimentation plans for preliminary grading, subject to conditions; or (3) disapprove the erosion and sedimentation plans for preliminary grading. In the event of conditional approval or disapproval, a statement, in writing, setting forth the conditions of approval, or the reasons for disapproval, shall be submitted to the subdivider.

SECTION 3.5 SUBMISSION OF IMPROVEMENT DRAWINGS AND SPECIFICATIONS: Following approval or conditional approval of the preliminary plat by the planning commission, the subdivider shall submit the improvement drawings and specifications to the City staff for review and approval, prior to the submission of the final plat. It shall also be the responsibility of the subdivider to submit copies of the improvement drawings and specifications to the applicable local and state governmental agencies and other organizations affected by the subdivision. Said improvement drawings and specifications shall include at least the area intended for processing as a final plat. At this time, the subdivider shall submit the following to the City staff:

1. Three (3) copies of the Sanitary Sewerage & Storm System Plans and Profiles (as per Sections 7.0 & 7.1).
2. Three (3) copies of the Water System Plans (as per Section 7.2).
3. Three (3) copies of the Street Plans and Profiles, including typical cross sections (as per Section 7.3).
4. Three (3) copies of the Drainage Report, including computations, (as per Section 7.0).
5. Three (3) copies of plans for grading and control of erosion and

sedimentation (as per Section 7.12) if not submitted previously for processing (as per Section 3.4).

6. The required fees as per Section 8.1.

SECTION 3.6 PROCESSING OF IMPROVEMENT DRAWINGS AND PLANS: The City staff shall check the improvement drawings and plans to ensure they are in conformance with the approved or conditionally approved preliminary plat and that they meet the requirements established in Article VII and other pertinent sections of these regulations. The staff shall also contact the applicable local and state governmental agencies and other organizations for their comments as they pertain to the proposed improvement drawings and specifications. Following these reviews, the staff shall take one of the following actions: (1) approve the improvement drawings and specifications; (2) approve the improvement drawings and specifications, subject to conditions; or (3) disapprove the improvement drawings and specifications. In the event of conditional approval or disapproval, a statement, in writing, by the staff, setting forth the reasons for conditional approval or disapproval, shall be submitted to the subdivider.

SECTION 3.7 SUBMISSION OF THE FINAL PLAT:

A. GENERAL: The Final Plat shall only be submitted after the Preliminary Plat has been approved. The Final Plat shall conform to the approved or conditionally approved preliminary plat and shall include all changes, additions, deletions, or approvals as may be required on conditional approval by the commission, and shall be prepared in accordance

with Article V and other applicable sections of these regulations.

B. PREPARATION: The subdivider may cause, within twenty-four (24) consecutive calendar months after the approval or conditional approval of the preliminary plat, the subdivision or any part thereof, to be surveyed and a final plat thereof to be prepared. The final plat shall contain only that portion of the approved or conditionally approved preliminary plat which the subdivider wishes to have approved, recorded and developed at that time. Final plats which are a portion of the approved or conditionally approved preliminary plat shall be named and listed as "Phase No.(Name of Subdivision)". Final plats which are resubdivisions of approved and recorded final plats shall be labeled as "RESUBDIVISION OF (Appropriate Listing Title)". The subdivider shall insure that the final plat is prepared under the supervision of a registered land surveyor.

C. FILING: The subdivider shall submit, to the City's staff, three (3) copies of the final plat drawing prepared in accordance with Article V of these regulations. As this time, the following material shall also be filed with the staff, unless otherwise noted:

1. Application for final plat approval: An application (provided by the commission) shall be submitted (see Appendix E). At the time of submission, the staff, shall indicate, on the application, the date of submission and signature of the City official.

2. Traverse sheets: One (1) copy of the traverse calculations.

The minimum traverse calculations required shall include a closed traverse of the subdivision boundaries (as per Section 5.0.B).

3. Improvement Drawings and Specifications: Improvement drawings and specifications will be required, if not submitted previously for processing, as per Sections 3.5 and 3.6.

   a. Three (3) copies of the Sanitary Sewerage & Storm Systems Plans and Profiles (as per Section 7.1).
   b. Three (3) copies of the Water System Plans (as per Section 2).
   c. Three (3) copies of the Street Plans and Profiles, including typical cross sections (as per Section 7.3).

4. Drainage Plans Including Computations and Plans for Control of Erosion and Sedimentation: This report will be required, if not submitted previously for processing, as per Sections 3.4 & 3.5.

   a. Three (3) copies of Drainage Report, including computations (as per Section 7.0).
   b. Three (3) copies of plans for control of erosion and sedimentation (as per Section 7.12).

5. As-Built Improvement Drawings: Where the improvement drawings and specifications were previously submitted and approved prior to the submission of the final plat, as per sections 3.5 and 3.6, and

where improvements were constructed differently from the originally approved improvement drawings, the subdivider shall submit three (3) copies of As-Built Improvement Drawings for the sanitary sewerage and storm system and water system.

6. Final Plat Fees: Final Plat fees shall be submitted in accordance with Section 8.1.

7. Guarantee: A guarantee (if applicable) per Section 7.16 of these regulations.

SECTION 3.8 PROCESSING OF THE FINAL PLAT AND WHERE APPLICABLE, THE IMPROVEMENT DRAWINGS AND SPECIFICATIONS: The City's staff shall check the final plat as to conformity with the approved, or conditionally approved, preliminary plat and all other pertinent aspects as required in Article VI and other applicable sections of these regulations. Where applicable, the staff shall also check the improvement drawings and specifications, drainage plans and plans for erosion and sedimentation control, to insure that they are in conformity with the final plat and that they meet the requirements established in Article VII and other pertinent sections of these regulations. In the event the improvement drawings and specifications were previously submitted and approved, prior to the submission of the final plat, the staff shall review the as-built drawings (if required as per Section 3.7,C,5) for their conformity to the final plat.

SECTION 3.9 PLANNING COMMISSION ACTION: Following the review of the final plat and when applicable, the improvement drawing and specifications, as per

Section 3.8, the staff shall take one of the following final actions:

A. FINAL APPROVAL -- final approval of a plat shall be given in one of two ways:

1. After construction of improvements: after the subdivider has obtained approval or conditional approval, as indicated in Section 3.6 and has installed all required improvements in compliance with these regulations and has provided as-built drawings, (if such improvements were constructed differently than from the originally approved improvement drawings), the planning commission shall then give final approval. The original drawing of the final plat shall then be signed and dated by the chairman of the planning commission.

2. Before construction of improvements: The City's staff may give final approval before all required improvements are installed, provided that a construction agreement and a guarantee are provided for the purpose of assuring installation of such improvements. The amount of the guarantee shall be based on an estimate made by subdivider and approved by the City Engineer (see Section 7.16). Upon determination that all requirements of these regulations have been met, the planning commission shall give final approval. The original drawing of the final plat shall then be signed and dated by the chairman of the planning commission. The guarantee shall not be returned to the subdivider until all improvements are installed, and as-built drawings have been provided, according to

these regulations.

B. DISAPPROVAL: Should the planning commission decide to disapprove the final plat, written notice of such action, including the reasons for disapproval shall be mailed to the subdivider by the Zoning Administrator. The action shall be entered on the official records of the planning commission.

SECTION 3.10 EFFECT OF APPROVAL: After the final plat has been approved by the planning commission, and signed by the chairman of the planning commission, it shall be recorded as specified in Section 3.12 of these regulations.

SECTION 3.11 DISPOSITION OF APPROVED FINAL PLAT: After approval of the final plat by the planning commission, the Zoning Administrator shall cause to have made at the expense of the subdivider, three (3) copies of the final plat to be retained by the Zoning Administrator one copy of which shall be a reproducible mylar to be retained by the City.

SECTION 3.12 RECORDING: After approval of the final plat, the original drawing of the approved final plat shall be filed in the county clerk's office, after which lots may be sold, leased, or transferred. A certificate of occupancy, however, may not be issued until all required improvements have been installed or a guarantee is executed as per section 7.16.B. In the case where sidewalk improvements have not been completed, a conditional certificate of occupancy shall be given, provided either a guarantee is executed as per Section 7.16,B of these regulations, or a time period for completion is estab-

lished, by contract with the applicable legislative body not to exceed six (6) months, signed by both the builder and owner of the premises for which the improvements will serve.

SECTION 3.13 SUBMISSION OF AS-BUILT IMPROVEMENT DRAWINGS: In the case where the planning commission has given final plat approval before construction of improvements as per Section 3.9,A,2, and after all water, sewer, and street improvements have been installed, in accordance with these regulations, the subdivider shall submit to the Zoning Administrator one (1) copy each of the as-built drawings for water, sanitary and storm sewer improvements, for record purposes.

SECTION 3.14 ACCEPTANCE OF IMPROVEMENTS FOR MAINTENANCE AND/OR LAND OFFERED FOR DEDICATIONS: After all improvements have been installed in accordance with the approved improvement drawings and specifications and the as-built drawings have been submitted, and the City Engineer and/or Building inspector has indicated, that the inspection was made and approved (as per Section 7.13) the applicable legislative body or other applicable public body should accept the improvements for maintenance (or in the case of lands to be dedicated may accept such lands in fee simple, by easement, or other such instrument approved by the applicable governmental body) and then transmit a copy of the instrument of acceptance to the Zoning Administrator.

SECTION 3.15 SUBMISSION AND PROCESSING OF IDENTIFICATION PLATS:

A. GENERAL: It is the purpose of the identification plat to provide a process whereby not more than two lots, including the residual property,

may be subdivided from land held in large tracts, without having to be processed through the preliminary and final plat procedures, as established in these regulations. Said identification plat process is also intended to provide for certain lot line adjustments that may be required (e.g., such as side and rear lot lines) when involving no more than three contiguous lots. In order to be processed as an identification plat, the following requirements must be met in addition to other requirements of these regulations:

1. The parcel to be subdivided will not involve the construction of any public water lines, storm and sanitary sewers, and streets, etc.

2. Not more than two lots, including the residual parcel, may be subdivided from the original tract of land existing prior to 1966.

3. Lot lines that are to be adjusted in already recorded subdivisions shall not involve more than three contiguous lots. If more than three lots are involved then said lots shall be handled as a resubdivision and processed according to the applicable requirements of the preliminary and final plats.

4. Except as noted in item (3) above, the identification plat process shall not be permitted in areas already approved or conditionally approved as a preliminary plat.

B. SUBMISSION OF THE IDENTIFICATION PLAT: The subdivider shall submit to the City staff, the original and three copies of the identification plat at a size measuring 8-1/2 x 11" or 8-1/2 x 14" (intended for attachment to a deed) and prepared in accordance with the applicable requirements of Article V and other pertinent sections of these regulations. In addition, the identification plat shall also contain the following information:

1. A statement by a registered land surveyor preparing the plat that the parcel represents the first or second parcel subdivided from the original tract existing prior to 1966.

2. In the case of the second lot to be subdivided, sufficient information shall be included to locate the parcel being subdivided in relation to the previous subdivided parcel, as well as its location within the original tract existing prior to 1966.

3. A vicinity map drawn at a scale of one (1) inch to two thousand (2,000) feet or greater (e.g., one (1) inch to one thousand (1,000) feet on the plat showing, within one half (1/2) mile of the proposed subdivision, existing roads and other significant features (e.g., streams, lakes, etc.).

At this time the following information shall also be filed with the staff:

1. Application for Identification Plat Approval: An application

(provided by the commission) shall be submitted (see Appendix E) at the time of submission, the staff, shall indicate on the application the date of submission and signature of the City official.

2. Traverse Sheets: One copy of the traverse calculations. The minimum traverse calculations required shall include a closed traverse of the subdivision boundaries as per Section 5.0,B.

3. Identification Plat Fees: Plat fees shall be submitted in accordance with Section 8.1 of these regulations.

C. PROCESSING OF IDENTIFICATION PLAT: The planning commission shall review the identification plat as per the applicable requirements of Article V, the requirements of this section, and other pertinent sections of these regulations. Following the review, the planning commission shall take one of the following actions: (1) approve the identification plat; (2) or disapprove the identification plat. Should the planning commission disapprove the identification plat, written notice of such action, including the reasons for disapproval shall be mailed to the subdivider by the planning commission. The action shall be entered in the official records of the planning commission. If approved and signed by the chairman of the planning commission, the original identification plat shall be recorded in the county clerk's office per the county's requirements.

SECTION 3.16 SUBMISSION AND PROCESSING OF CONDOMINIUM PROPERTY REGIME PLATS:

A. GENERAL: In accord with the Horizontal Property Law (KRS 381.805-381.910), whenever a developer, the sole owner, or the co-owners of a building or buildings constructed or to be constructed, expressly declare, through the recordation of a master deed or lease, a condominium property regime may be established. Once the property is submitted to the condominium property regime, a unit in the building(s) may be individually conveyed and may be the subject of ownership possession or sale and other acts as if it were sole and entirely independent of the other units in the building(s) of which they form a part and the corresponding individual titles and interest shall be recordable. It is the purpose of the condominium property regime plat to provide a process whereby two or more apartments, townhouses, rooms, office spaces, or other units in existing or proposed buildings or structures may be subdivided and offered for sale in accordance with requirements as established by these regulations. In order to be processed as a condominium property regime plat, the following requirements must be met in addition to other requirements of these regulations and applicable sections of KRS 381.805 to 381.910:

1. The condominium project will not involve the construction of any public streets, water lines, storm and sanitary sewers which require review and processing through preliminary and final plat procedures.

2. The condominium project will not involve the subdivision and con-

veyance of land with any unit within the condominium property regime for which other processes are available.

B. SUBMISSION OF CONDOMINIUM PROPERTY REGIME PLATS: The developer shall submit to the planning commission, three (3) copies of the final plat drawing prepared in accordance with Article V of these regulations. In addition to other requirements of these regulations, the final plat shall show the location of the building or buildings proposed for the condominium project. Simultaneously, with the submission of the final plat, there shall be attached three (3) copies of a set of floor plans of the building or buildings in accord with KRS 381.835 bearing the certification of a registered architect or professional engineer.

At this time, the following information shall be filed with the City staff:

1. Application for Condominium Property Regime Plat Approval: An application form provided by the commission, shall be submitted (see Appendix E) at the time of filing for Condominium Property Regime Plat approval.

2. Traverse Sheets: One (1) copy of the traverse calculations. The minimum traverse calculations required shall include a closed traverse of the property (as per Section 5.0,B).

3. Master Deed or Lease: One (1) copy of the master deed or lease, in accord with the requirements of KRS 381.835 to 381.837.

4. Condominium Property Regime Plat Fees: Plat fees shall be submitted the same as for Final Plats, in accord with Section 8.1 of these regulations.

C. PROCESSING OF CONDOMINIUM PROPERTY REGIME PLATS: The City staff shall review the condominium property regime plats for conformance to the applicable requirements of Article V of these regulations and KRS 381.805 to 381.910. Following the review, the staff shall forward it's recommendation and/or comments to the planning commission. The planning commission shall then review the recommendations of the staff and shall take one of the following actions: (1) approve the condominium property regime plats; (2) or disapprove the condominium property regime plats. Should the planning commission disapprove the plats, written notice of such action, including the reasons for disapproval, shall be mailed to the subdivider by the Zoning Administrator. The action shall be entered in the official records of the planning commission and signed by the Chairman of the Planning Commission. If approved and signed by the Chairman of the Planning Commission, the original condominium property regime plats shall be recorded simultaneously with the master deed or lease in the county clerk's office per the county's requirements.

ARTICLE IV

PRELIMINARY PLAT REQUIREMENTS

SECTION 4.0 SPECIFICATIONS FOR AND CONTENT OF THE PRELIMINARY PLAT: The following information shall be clearly shown or accompany the preliminary plat: The subdivider shall file with the City staff, three (3) copies of the preliminary plat for review. Such plat shall be drawn at a scale of one (1) inch to one hundred (100) feet or greater (e.g., one (1) inch to fifty (50) feet.

A. 1. proposed name of subdivision, which shall not duplicate or too closely approximate, phonetically, or in spelling, the name of any other subdivision in the county.

2. name, address, and phone number of record owner(s).

3. name, address, and phone number of subdivider(s).

4. name, address, and phone number of person, firm, or organization preparing the preliminary plat, with the seal and signature of the registered professional engineer responsible for its preparation.

5. north point, written and geographic scale, and date.

6. vicinity sketch map: a vicinity sketch map drawn at a scale of one (1) inch to two thousand (2000) feet or greater (e.g., one (1) inch to one thousand (1000) feet, including the following

information, if applicable within at least one half (1/2) mile of the proposed subdivision:

a. proposed subdivision name and location;

b. existing and proposed streets;

c. other significant features (e.g., streams, lakes, etc.)

7. The perimeter boundary lines of the tract to be subdivided and submitted as a preliminary plat shall be drawn to scale showing all bearings and distances.

8. The existing use or uses of the property and, to scale, the outline of any existing buildings or improvements to be retained and their location in relation to existing or proposed street and lot line locations (addresses if available).

9. The right-of-way lines and names of all existing or platted platted streets, other public ways and easements adjacent to or in connection with the subdivision including right-of-way widths and other important features at least within one hundred (100) feet of the boundary lines, such as railroad lines, watercourses, etc.

10. Names of adjacent subdivisions and the property lines, at least within one hundred (100) feet of the subdivision boundary, and owners of record of all adjacent parcels that are unsubdivided (for adjacent platted land, refer to subdivision plat by name, plat book, and page).

11. Location and dimensions of all existing easements and rights-of-way within the subdivision.

12. Existing utilities on and adjacent to the subdivision: location and size of water mains, sanitary, storm and/or combined sewers.

13. Existing contours at five (5) foot intervals within the subdivision and within 100 feet of the subdivision boundary.

14. Subsurface conditions on the subdivision; any known conditions that are not typical, or which may cause problems, such as: soils and geological formations, old mine shafts, wells, known material deposits, etc.

15. Proposals:

    a. Streets and alleys: layout, names, right-of-way and pavement widths, approximate corner radii at the right-of-way line and the approximate proposed grades of all streets.
    b. other rights-of-way or easements: location, width, and purpose.
    c. Lots: lots & blocks numbered.
    d. Water and Sewer Systems: plan view layout of water lines, storm and sanitary sewer lines, including sizes, to serve the subdivision.

16. Statement of the lot area of the smallest lot in the subdivision

(reference shall be made to the lot and block number).

17. Parcels of land intended to be dedicated or temporarily reserved for public use, or to be reserved by deed restriction or protective covenant for use of all property owners in the subdivision or parcels of land or lots to be used for any purpose other than private, shall be so designated.

18. Proposed uses for all land in the subdivision.

19. Approximate boundaries of areas subject to flood of 100 year frequency (including 100 year floodway) and the location, width, and direction of flow of all watercourses, lakes, marshy areas, and swamps.

20. Total site data: including acreage, number of lots, and if applicable, approximate number of square feet or acres in parks and other public uses.

21. Tree Conservation and Restoration Requirements as established per City Ordinance 0-4-90 including all amendments thereto.

B. ADDITIONAL INFORMATION TO BE SUBMITTED AT TIME OF FILING OF PRELIMINARY PLAT:

1. One (1) copy of an application for Preliminary Plat approval (provided by the commission)- See Appendix E.

2. If individual on-site disposal systems have been approved, as per Section 7.1 (c) of these regulations, One (1) copy of a permit to use on-site disposal systems approved by the Northern Kentucky District Health Department.

3. One (1) copy of applicable board of adjustment action identifying any dimensional variances granted, if applicable.

4. In the event the subdivider elects to proceed with preliminary grading following the preliminary plat approval or conditional approval, but prior to submission and processing of the improvement drawings and specifications, one (1) copy of plans for grading and control of erosion and sedimentation must also be submitted to the City Engineer, for review and approval.

ARTICLE V

FINAL PLAT REQUIREMENTS INCLUDING IMPROVEMENT DRAWINGS AND SPECIFICATIONS

SECTION 5.0 SPECIFICATIONS FOR AND CONTENT OF THE FINAL PLAT: The subdivider shall file with the Zoning Administrator, three (3) copies of the final plat for review. The Final Plat of the subdivision shall be drawn on material as required by the county clerk's office in a black, waterproof media ink. The Final Plat shall be drawn at a scale of one (1) inch to fifty (50) feet or greater (e.g., one (1) inch to thirty (30) feet.) However, if the final plat will contain lots of one hundred (100) feet or greater, fronting along a street, then a scale of one (1) inch to one hundred (100) feet or greater may be used.

Where necessary, the Final Plat may be on several sheets accompanied by an index showing the entire subdivision. The particular number of the sheet, the total number of sheets, and the relation of each adjoining sheet shall be clearly shown by a small key map on each sheet. Each sheet of said plat shall show the north point, written and graphic scale and the date. The Final Plat shall contain a vicinity map showing the location of the subdivision with relation to at least one (1) east/west and one (1) north/south major arterial. The Final Plat shall further locate and retrace any of the required data thereon.

A. INFORMATION TO BE CONTAINED ON FINAL PLAT:

1. The boundary lines of the final plat shall be drawn in heavy solid lines with accurate lengths and bearings. These boundaries

shall be determined by an accurate field survey, which shall be balanced and closed. All lines shown on the Plat which do not constitute a part of the subdivision shall be dashed. Any area enclosed by the subdivision, but not a part thereof, shall be labeled "Not A Part Of This Subdivision".

2. The exact location and the widths of all existing or recorded streets, intersecting or paralleling the boundaries of the subdivision at least within one hundred (100) feet.

3. The exact location and width of all abutting lot lines. Names of recorded owners of adjoining unplatted land and reference to subdivision plats of adjoining platted land by name, plat book, and page and lot numbers for lots within an existing subdivision.

4. The boundary line of the proposed final plat shall be tied by bearings and distances to a selected point or points (described on the plat) on the nearest established centerline or right-of-way line of any street or highway or a previously established monument(s) in which case the location of said monument shall be identified and accurately described on the plat. In addition, the final plat shall be tied by bearings and distances to a point in the original parent tract.

5. Municipal and county boundaries lines, if applicable.

6. The exact layout of the subdivision showing:

a. street and alley centerlines and right-of-way lines shall be graphically shown; street names and bearings and distances along centerlines.

b. sufficient linear, angular, and curve data (at least Delta, Tangent, Radius, and Length of Curve) to readily determine the bearing and length of the boundary lines of every block, lot and tract which is a part of the subdivision.

c. all easements or other rights-of-way (the limitation of the easement rights shall be stated or referenced on the plat).

d. all lot lines with dimensions and bearings.

7. Identification of any waivers of the subdivision regulations granted by the planning commission, such as: sidewalks on one side of the street; width of street pavement; any need for additional off-street parking spaces; etc.

8. All blocks and lots numbered or lettered in a consecutive manner with no omissions or duplications. Lot area of all lots. Ditto marks shall not be used for lot dimensions. Tracts offered for dedication, other than for streets or easements shall be designated by letter or number (further, the accurate outline of all such tracts shall be shown with the proposed use indicated thereon).

9. All permanent monuments set or to be set shall be shown on the

Final Plat (see Section 7.10, A & B):

a. the location of all monuments placed in making the survey and if any points were reset, that fact shall be stated and attached to final plat for recording. (minimum four (4) monuments per subdivision boundary)

b. monuments shall be set at intersections of street center lines and curve points or offsets therefrom. The exact location of all such monuments shall be shown on the final plat before approval is requested.

c. description (size and material) of all monuments set and/or found.

10. The accurate outline of all property (if applicable) which is to be reserved by deed restriction or protective covenant for the common use of the property owners in the subdivision.

11. Flood Hazard Information: Elevation and flood profiles shall be shown on the final plat if required (as determined as per Section 6.4 (A) of these regulations).

12. All easements shall be shown by a fine dashed line and clearly labeled and identified on the plat. If an easement shown on the plat is already of record, its recorded reference must be given.

13. Name of the subdivision and name or number or the larger subdivision or tract of which the tract now being subdivided is a part.

14. North point (showing true north), written and graphic scale, and date.

15. Total site data: including acreage, and, if applicable, number of square feet or acres in parks and other public uses.

16. Certification, acknowledgments and descriptions: The following certificates, acknowledgments, and descriptions shall appear on the title sheet of the final plat (unless otherwise stated herein). Representative certificates, acknowledgments, and approvals that shall be used on the final plat appear in Appendix D of these regulations.

    a. dedication certificates: a notarized certificate shall be signed and acknowledged offering for dedication all parcels of land shown on the final plat which are intended for public dedication.

    b. Surveyor's certificate: a certificate shall be signed by a Registered Land Surveyor, in Kentucky, stating that he is responsible for the survey and that the Final Plat accurately depicts the subdivision and the survey. The signature of such surveyor must be accompanied by his seal and registration number.

c. reference of property from which the plat is taken: each reference in such description to any tract, development, or subdivision, shall show a complete reference to records of the county.

d. other affidavits, etc.: the title sheet shall contain such other affidavits, certificates, acknowledgments, endorsements, and notarial seals as are required by law and by these regulations. If such documents are recorded elsewhere, then reference to such documents should be included on the final plat.

e. certificate of approval by the chairman of the planning commission.

f. certificate of acceptance for recording by the county clerk.

g. certificate of acceptance of public improvements and lands dedicated for public use by the Mayor.

B. ADDITIONAL INFORMATION TO BE SUBMITTED AT TIME OF FILING OF FINAL PLAT:

1. One (1) copy of an application for final plat approval provided by the commission (see Appendix E).

2. One (1) copy of traverse calculations, resulting from an accurate and complete boundary survey of the perimeter of the final plat.

Traverse calculations when computed from field measurements, on the ground, shall close with an error of closure not to exceed one (1) foot to five thousand (5,000) feet.

3. Improvement drawings and specifications (improvement drawings and specifications will be required if not submitted previously for processing as per Sections 3.5 and 3.6): Drawings, showing typical cross sections, profiles, construction details, and specifications for all required improvements shall be prepared by a registered engineer in conformance with the provisions in Article VII and any other pertinent sections of these regulations.

   a. Three (3) copies of the Sanitary Sewerage & Storm Systems Plans (as per Sections 7.0 & 7.1).

   b. Three (3) copies of the Water System Plans (as per Section 7.2).

   c. Three (3) copies of the Street Plans and Profiles, including typical cross sections (as per Section 7.3).

   d. Three (3) copies of the Drainage Report, including computations (as per Section 7.0).

   e. Three (3) copies of plans for control of erosion and mentation (as per Section 7.12).

4. As-Built improvement drawings: Where the improvement drawings and plans were previously submitted and approved prior to the submission of the final plat, the subdivider shall be required to submit two (2) copies each of as-built improvement drawings for: sanitary sewerage & storm system, and water system & roadway.

5. Two (2) copies of all deed restrictions or protective covenants (may be either placed directly on the final plat, or if separately recorded, reference is made on the final plat).

6. Final plat fees: final plat fees shall be submitted in accordance with Section 8.1.

7. Guarantee: a guarantee (if applicable) per Section 7.18.

8. Recording fees: The subdivider shall pay the recording fee, per requirements of the county clerk.

ARTICLE VI

DESIGN STANDARDS FOR THE LAYOUT OF SUBDIVISIONS

SECTION 6.0 STREETS

A. Conformity to comprehensive plan and/or official map: whenever a tract of land to be subdivided or resubdivided includes any part of, or is adjacent to, a proposed arterial or collector street as designated on the comprehensive plan and/or the official map, the subdivider shall meet with the Zoning Administrator to determine the design requirements needed for compliance with comprehensive plan (e.g., right-of-way width for future widening and pavement widths).

B. Street Extension:

1. Existing Streets: the arrangement of streets in new subdivisions shall make provision for the proper continuation of existing streets in adjoining areas, unless determined otherwise by the planning commission.

2. Adjacent Property: where adjoining areas are not subdivided and are appropriate for future subdivision, arrangement of streets in new subdivisions shall make provision for the proper projection of streets to those adjoining areas in a manner which shall provide for the practical development of the adjacent property.

3. Half streets: Dedication of one-half (1/2) of the right-of-way (half streets) for streets proposed along the boundaries of land to be subdivided, shall be prohibited.

C. Street Classification and Function:

1. Arterial Streets: Arterial streets should be planned so as to provide for the smooth flow of traffic between points of heavy traffic generation and from one section of the community or communities to another. Such arterial streets should traverse the entire community or communities. Arterial streets should not bisect neighborhoods but should act as boundaries between such neighborhoods. Direct access onto the roadway from abutting properties shall be discouraged.

2. Collector Streets: Collector streets should be designed to provide for the smooth flow of traffic from subcollector streets to arterial streets. These streets should be designed to carry traffic which has an origin or designation within the neighborhood and between arterial streets. Said streets shall be designed in such a manner to discourage "short cuts" through the neighborhood. Direct access to abutting property should be discouraged whenever possible.

3. Subcollector Streets: Subcollector streets shall be designed to provide a traffic route from local streets. Said streets will serve equally both traffic movement and abutting properties.

4. Local Streets, including Cul-de-sacs and courts: Local streets shall provide direct and full access to each lot and direct traffic movement to another local street or to a subcollector street. Said street shall be laid out so that their use by through traffic will be discouraged. Local street intersections with arterial streets shall be discouraged, whenever practical.

5. Frontage Roads: Frontage roads may be required along existing or proposed arterial street to provide access to lots along such streets.

6. Alleys: Where alleys are to be provided (e.g., in the case of certain commercial development), they shall be designed to provide only secondary access.

D. Street Rights-of-Way and Grades:

1. Widths and grades of new streets: Street right-of-way widths and grades shall conform to the following minimum requirements:

The planning commission shall maintain the authority to grant relief of strict compliance of street grades when unique circumstances are presented and substantiated by the applicant.

TABLE 1

STREET RIGHTS-OF-WAY WIDTH AND GRADE REQUIREMENTS

TYPE OF STREET	MINIMUM RIGHT-OF-WAY WIDTH (IN FEET)***	GRADES BY PERCENT MAXIMUM	MINIMUM
ARTERIAL	*	*	*
COLLECTOR	60	10	.5
SUBCOLLECTOR	50	12	.8
LOCAL (INCLUDING CUL-DE-SACS)			
Residential	50	12	.8
Commercial and Industrial Areas	60	12	
COURTS (LESS THAN 400' LENGTH)	40	12	.8
FRONTAGE ROAD	**	**	**

* Arterial streets shall be based on current design standards and other pertinent requirements of the Kentucky Department of Transportation and the official area-wide comprehensive plan.

** Requirements will vary for a frontage road depending on whether the street would serve as a local subcollector or collector type street and as such would be designed in accordance with the respective requirements of said streets.

*** Except as may be permitted in Table 3 of these regulations.

2. Existing Streets: Subdivisions platted along existing streets shall dedicate additional right-of-way, if necessary, to meet the minimum street width requirements set forth in Section 6.0, Subsection D (1) of these regulations. Such dedication shall be in accordance with the following:

   a. At least the minimum right-of-way width shall be dedicated where the subdivision is on both sides of an existing street

   b. When the subdivision is located on only one side of an existing street, one-half (1/2) of the required right-of-way width, measured from the centerline of the existing right-of-way, shall be dedicated. However, the owner or owners of such property shall not be required to dedicate more than one-half (1/2) of the required rights-of-way width.

Curves and Sight Distance Criteria:

1. Horizontal Curve: Where there is a change in the alignment of a street along the centerline, a curve with a radius adequate to insure safe sight distance shall be constructed. The minimum radii of curves shall be:

STREET TYPE	MINIMUM CURVE RADIUS
Arterial	*
Collector	400 feet
Local or Subcollector	100 feet

TABLE 2a

SIGHT DISTANCES FOR VEHICLES EXITING FROM ACCESS POINTS ONTO ADJACENT ROADS

D = DISTANCE ALONG MAJOR ROAD FROM ACCESS POINT TO ALLOW VEHICLE TO ENTER SAFELY (FEET) SEE ACCOMPANYING ILLUSTRATION (*)

VEHICLE TYPE	20 MPH				30 MPH				40 MPH				50 MPH				60 MPH			
	2 Lane		4 or 6 Lane		2 Lane		4 or 6 Lane		2 Lane		4 or 6 Lane		2 Lane		4 or 6 Lane		2 Lane		4 or 6 Lane	
	DL	DR	DL	DR	DL	DR	DL	DR	DL	DR	DL	DR	DL	DR	DR	DL	DL	DR	DL	DR
Passenger Car	150	130	130	130	360	260	220	260	530	440	380	440	740	700	620	700	950	1050	950	1050
Truck	300	200	200	200	500	400	400	400	850	850	850	850	1600	1600	1600	1600	2500	2500	2500	2500

TABLE 2b

LEFT TURN SIGHT DISTANCE FOR VEHICLES ENTERING ACCESS POINTS

S = SIGHT DISTANCE ALONG MAJOR ROUTE FOR VEHICLE TO SAFELY TURN LEFT INTO ACCESS POINT (FEET) - SEE ACCOMPANYING ILLUSTRATION

VEHICLE TYPE	20 MPH			30 MPH			40 MPH			50 MPH			60 MPH		
	2 Lane	4 Lane	6 Lane	2 Lane	4 Lane	6 Lane	2 Lane	4 Lane	6 Lane	2 Lane	4 Lane	6 Lane	2 Lane	4 Lane	6 Lane
Passenger Car	150	160	170	230	250	270	370	390	420	520	550	580	700	740	780
Truck	260	260	300	400	440	480	570	620	670	810	880	950	1000	1100	1200

* Measured from a vehicle ten (10) feet back of the pavement edge.

NOTE:

Values are for urban conditions. On rural streets, distances are to be increased by 10 percent to allow for longer drive reaction time

The sight distances apply when street grades are zero to 3.0 percent (either up or down). When an upgrade is steeper than 3.0 percent, adjustments are to be made to compensate for the longer time required to reach the speed of highway traffic. The time is less than shown when the highway is descending. Adjustment factors below apply to grades only in that portion of the road between the access points and the downstream point at which a vehicle emerging from the access points has been able to accelerate to within ten miles per hour of the route speed.

When the street, in the section to be used for acceleration after leaving the access point, ascends at 3 to 4 percent, then sight distances in the direction of approaching ascending traffic are to be increased by a factor of 1.4. When the access point ascends at 5 to 6 percent, sight distance should be increased by a factor of 1.7.

When the road in the section to be used for acceleration after leaving the access point descends at 3 to 4 percent, sight distance in the direction of approaching descending highway traffic should be reduced by a factor of 0.6 If the road descends at 5 to 6 percent, sight distance should be reduced by a factor of 0.5.

When the criteria for sight distances to the right cannot be met, the need can be eliminated by prohibiting left turns by exiting vehicles.

TABLE 3
IMPROVEMENT REQUIREMENTS BY TYPE OF STREET
SERVING RESIDENTIAL SUBDIVISIONS (F)

TYPE OF STREET	NO. OF LOTS SERVED	RIGHT-OF-WAY (IN FT.)	PAVEMENT WIDTH (IN FT.)	CURB AND GUTTER(C)	SIDEWALKS ALONG STREET(B)	ON-STREET PARKING	MINIMUM FRONT YARD DEPTH REQUIRED (IN FEET)	OFF-STREET PARKING REQUIRED	MINIMUM LOT WIDTH REQUIRED (IN FEET)	MINIMUM PAVEMENT THICKNESS
COURTS - Deadend Typical Optional	Under 7	40 40	25 22	Yes Yes	One side One side	One side None	(A) 35	(A) 4 spaces(E)	(A) (A)	(G)
CUL-DE-SAC-deadend Typical Optional	7-25	50 40	28 25	Yes Yes	Both side Both side	One side None	(A) 50	(A) 4 spaces(E)	(A)	(G)
LOCAL Typical Optional	Under 100	50 40	28 25	Yes Yes	Both sides Both sides (B)	One side None	(A) 50	(A) 4 spaces(E)	(A) 100 (H)	(G)
SUB-COLLECTOR Typical Optional	100-500	50 40	28 25	Yes Yes	Both sides Both sides (B)	One side None	(A) 50	(A) 4 spaces (E)	(A) 100	(G)
COLLECTOR(D) Typical Optional	Over 500	60 60	40 36	Yes Yes	Both sides Both sides (B)	Both side one side	(A) 50	(A) 4 spaces(E)	(A) 100	(G)

NOTE: Where streets are to serve industrial or commercial areas, the pavement design shall be based on a study prepared by the subdivider's engineer, projecting the type of vehicles using the street and traffic volumes and approved by the planning commission's duly authorized representative.

(A) Minimum as per applicable zoning ordinance requirements.

(B) Sidewalks may be permitted on only one side of the street, providing the minimum front yard depth is 50 feet and the minimum lot width is 100 ft. When subdivisions are designed to provide pedestrian walkways to the rear of lots or in other locations other than along the street, the planning commission may waive sidewalks along the streets. In the case where local streets serving less than 25 lots, sidewalks may be permitted on one side of the street.

(C) Shoulders and side ditches may be permitted and designed in accordance with these regulations (see Appendix C) provided the minimum front yard depth is 50 feet, the minimum lot width is 100 feet, the minimum right-of-way is increased by 10 feet, except for collector streets.

(D) Driveway access points along collector streets shall be discouraged, however, if permitted, shall be spaced not less than 200 feet apart.

(E) Individual off-street parking spaces shall be laid out in such a manner to insure that each space has unrestricted ingress and egress to a public street (i.e., not blocked from gaining access to the street via another parked vehicle).

(F) Arterial streets shall be designed in accordance with the requirements of the Kentucky Department of Transportation.

(G) Minimum pavement thickness for portland cement concrete and asphalt concrete shall be designed in accordance with Table 3 and 6, respectively.

(H) In the case where local streets serving less than 25 lots, the minimum lot width shall be as per the applicable zoning ordinance requirements.

2. Sight Distance: Minimum sight distance shall be as required on Tables 2a, 2b, and 2c.

3. Reverse Curves: A tangent of at least two hundred (200) feet for collector streets, shall be provided between reverse curves. No tangent shall be required for local and subcollector streets.

4. Vertical Curves: The minimum vertical curve length required shall be calculated by multiplying the algebraic difference in grades times a "K" factor. Rounded "K" factors for local and subcollector and collector streets are as follows:

Local	--	K-15 for crest curves
and		
Subcollector	--	K-15 for sag curves
Collector	--	K-30 for crest curves
		K-35 for sag curves

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* Design of arterial streets shall be based on current standards of the Kentucky Department of Transportation.

F. Cul-de-Sac and Dead-end Streets: Cul-de-Sacs and Dead-end streets designed and constructed to be dead-end permanently, unless local topographic or other physical conditions are such as to render this provision impracticable.

G. Street Names

1. Duplication: The name of a new street shall not duplicate existing or platted street names in the county, or approximate such names in spelling, or sound, or pronunciation, or by the use of alternate prefixes such as "North", "South", or such suffixes as "Lane", "Way", "Drive", "Court", "Avenue", "Street", etc.

2. Continuation of Streets: New street names shall bear the same name of any continuation of, or when in alignment with, an existing or platted street.

3. Approval of Street Names: All street names shall be approved by the planning commission before approval of the final plat.

H. Private Streets:

1. New private streets or alleys shall not be created or extended, except as approved by the planning commission, and existing ones shall, whenever practicable, be dedicated to the public. The Planning Commission may approve private streets to serve three (3) lots or less within any subdivision. Private streets shall be a minimum of sixteen (16) feet in width. Pavement composition shall be consistent with standards established herein for public streets. "On-street" parking restrictions shall be implemented for all private streets and "on-street" parking restrictions shall be implemented.

SECTION 6.1 INTERSECTIONS:

A. Angle of Intersection: The centerline of all streets shall intersect as nearly at a ninety (90) degree angle as possible, but in no case shall the angle of intersection be less than seventy (70) degrees or greater than one hundred and ten (110) degrees, unless a special modification is granted by the planning commission due to certain exceptional conditions.

B. Centerline Offset of Adjacent Intersections: Where T-intersections are used, the following minimum centerline offsets of adjacent intersections shall be as follows:

TYPE OF STREET	MINIMUM CENTERLINE OFFSET OF ADJACENT INTERSECTIONS IN FEET
Local - Local	150
Local - Subcollector	150
Subcollector - Collector	150
Collector - Collector	200

C. Corner Radii: Property lines at street intersections shall be provided from the same radius point necessary to establish the pavement radius. If because of certain exceptional conditions, a modification is granted permitting an angle of intersection less than seventy (70) degrees, or greater than one hundred and ten (110) degrees, then the minimum radii shall be increased or decreased, respectively.

D. Centerline Grades Within Intersections: Maximum centerline grades

within street intersections shall not exceed the grade for through streets, as identified in Table 1 of these regulations, depending on the type of street. The maximum grade of the centerline of the side streets intersecting with the gutter line of the through street shall not exceed four (4) percent for a distance of not less than seventy-five (75) feet from the centerline for local and subcollector streets and one hundred and fifty (150) feet for collector streets.

E. Design Adjacent to Freeways, Expressways, Arterials or Collectors: The following principles shall be used in the design of subdivisions adjacent to freeways, expressways, or arterials:

1. Street Design shall have the purpose of making adjacent lots desirable by cushioning the impact of heavy traffic and of minimizing the interference with traffic on such thoroughfares.

2. Collector, Subcollector, and Local streets shall not be permitted to intersect with freeways or expressways. The number of intersections with arterial streets shall be held to a minimum. Wherever practical, such intersections shall be spaced not less than 600 feet apart. In the case of collector streets, intersections with said streets shall be spaced not less than four hundred (400) feet apart and access to driveways shall be spaced at intervals of not less than 200 feet. At those access points where turning vehicles to and from the arterial and collector streets will affect the roadway capacity or safety, reserved turn lanes shall be required, wherever practical. Frontage or service roads shall be used when these spacing requirements cannot be met.

3. Where frontage roads are not required, lots adjacent to such thoroughfares shall, when practical, be served and be accessible only by a street generally paralleling said thoroughfare from an internal street system.

SECTION 6.2 EASEMENTS:

A. Utility Easements: Public utility easements at least ten (10) feet in total width may be required along the front, rear and sides of lots where needed for the accommodation of a public utility, drainage, or sanitary structures, or any combination of the foregoing. Where deemed necessary by the planning commission or its staff, an additional easement width shall be provided.

B. Watercourses: The subdivider shall dedicate rights-of-way or provide easements for storm drainage purposes which conform substantially with the lines of any natural watercourses, channels, streams, or creeks which traverse the subdivision or for any new channel which is established to substitute for a natural watercourse, channel, stream, or creek. Such rights-of-way or easements shall be of a width which will provide for the maintenance needs of the channel as determined by the planning commission.

SECTION 6.3 PHYSICAL CONSIDERATIONS:

A. Natural Land Use: Wherever practical, subdivisions shall be planned to take advantage of the natural topography of the land, to economize in the construction of drainage facilities, to reduce the amount of danger,

to minimize destruction of trees and topsoil, and to preserve such natural features as watercourses, unusual rock formations, large trees, sites for historical significance, and other assets which, if preserved, will add attractiveness and value to the subdivision and the community.

SECTION 6.4 FLOOD HAZARDS:

A. Prohibition of development in Areas Susceptible to Flooding: Land subject to flooding or otherwise uninhabitable shall not be platted for residential, commercial, or industrial uses or for any other use which may increase the danger of health, life, property, or aggravate erosion or flood hazards. Such land within the subdivision shall be set aside on the plat for such uses as will not be endangered by periodic or occasional inundation or will not result in conditions contrary to the public welfare (e.g., use as open space, extensive recreation use, conservation purposes).

B. Areas of land adjacent to streams, rivers, or bodies of water which have a high degree of susceptibility to flooding shall be limited to development according to either the flood protection control regulations, if adopted as part of the applicable zoning ordinance, or according to the following regulations:

1. The limits of the floodplain (areas subject to flooding during the occurrence of a 100-year flood) including elevations of the 100-year flood level along the Ohio River and certain tributaries thereof, are designated on maps and charts on file with the Ky.

Division of Water. The limits of the floodway are contained within the flood plain area.

2. In the case of any subdivision to be developed along the tributaries of the Ohio River and located in those areas which are identified as being susceptible to flooding according to the report prepared by the U.S. Department of the Agriculture, Soil Conservation Service, "Soil Survey of Boone, Campbell, and Kenton Counties, Kentucky", August, 1973, a survey shall be made by a qualified civil engineer establishing the limits of the 100-year floodplain and floodway for said tributary.

3. No subdivider in development of a subdivision, shall fill any area with earth, debris, or any other material or raise the level of any area in any manner, or place a building, barrier, or obstruction of any sort on any area located within the floodway which would result in any increase in flood levels during the occurrence of a 100-year flood discharge. Plans and specifications for any work which the subdivider believes will not increase the flood levels shall be submitted to the City staff for review and approval to determine if said encroachment will meet the requirements of these regulations. Mobile homes shall be prohibited from being placed within the floodway.

4. All land in the subdivision which is outside the floodway of the Ohio River and its tributaries, but located within the floodplain, may be used for any purpose for which it is zoned; provided that

(a) the land is graded in such a manner that any residential construction, within said floodplain shall have the lowest floor, including the basement, elevated to or be above the level of the 100-year flood; and (b) the land is graded in such a manner that any new nonresidential structures within the floodplain area shall have the lowest floor (including basements) elevated to or be above the level of the 100-year flood or together with attendant utility and sanitary facilities shall be designed and floodproofed so that any structures that are anticipated to be constructed below the 100-year flood level are water tight with walls impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

5. All streets and utilities constructed to serve the subdivision to be located within the floodplain, but outside the floodway, shall be: (a) flood protected; (b) the land filled; or (c) any combination thereof, to a level of not less than the elevation of the 100-year flood level. Where the fill is partially within the floodplain, roadway access and utilities shall be provided from the "dry" side (areas located above the 100-year floodplain).

C. Stream Easement: If a stream flows through or is adjacent to, the proposed subdivision, the plat shall provide for a storm water easement or drainage right-of-way along the stream for a floodway of at least ten (10) feet. For the smaller streams, the plat shall provide for channel improvement to enable them to carry all reasonable floods (25 year flow)

within banks. The floodway easement shall be wide enough to provide for future enlargement of the stream channels as adjacent areas become more highly developed and run-off rates are increased. (Based upon development under present zoning classification.)

D. Streets: Approval shall not be given for streets within a subdivision which would be subject to flooding. All streets must be located at elevations above a flood of a 100-year frequency. However, streets may be permitted in areas subject to flooding of a 100-year frequency provided said streets provide access to activities relating to rivers, streams, and recreational activities located along said areas.

SECTION 6.5 BLOCKS:

A. Arrangement: The arrangement of blocks shall be such as to provide for convenient access, circulation, control and safety of street traffic. Blocks intended to be used for commercial or industrial purposes shall be designed specifically for such uses with space set aside for off-street parking and loading and/or unloading facilities as required by the applicable zoning ordinance.

B. Length: Blocks should not exceed twelve hundred (1,200) feet, except where topographical or exceptional physical conditions exist.

C. Width: The width of blocks should ordinarily be sufficient to allow for two (2) tiers of lots except for double frontage lots, as permitted in

Section 6.6 of these regulations.

SECTION 6.6 LOTS:

A. Conformance to Zoning: All lots shall conform to or exceed the requirements of the applicable zoning ordinance. Each lot shall front at least twenty five (25) feet onto a publicly dedicated street and comply with all applicable sections of the City's Official Zoning Ordinance.

B. Lot Frontage and Width:

1. Arterial Street Frontage: No access onto an arterial street shall be permitted from abutting properties except as provided for in these regulations.

2. Corner Lots: Corner lots shall have extra width to permit conformance to the minimum setback from the side street. In no case shall a corner lot be so narrow that minimum zoning requirements cannot be met.

3. Double Frontage Lots: Lots shall not be laid out so that they have frontage onto more than one (1) street except: (a) when the lots are adjacent to the intersection of two (2) streets; or (b) when the rear of the lot faces an arterial, freeway, expressway, collector street, railroad right-of-way, etc., and the front of the lot faces onto another street.

C. Lot Depth:

1. Conformance to Zoning: Each lot shall conform to all requirements

of the official zoning ordinance.

2. Maximum Depth: The maximum depth of a lot shall not be greater than four (4) times the width of the lot, except lots which contain over five (5) acres of area. Exceptional individual site conditions may require variation from these requirements, as permitted by the planning commission.

3. Extra Depth and Width in Certain Cases: Additional side yard and lot depth as per the applicable zoning ordinance may be required where a lot in a subdivision abuts an industrial or commercially zoned area.

D. Usable Lots:

1. Building Lots: All subdivisions shall result in the creation of lots which are developable and capable of being built upon. No lots may be developed which create building sites which are impracticable to improve due to known problems related to soil conditions and geological formations, topography, and areas subject to flood prone conditions based on information prepared by the U.S. Soil Conservation Service, Geological survey maps prepared by the U.S. Geological Survey, and flood prone information supplied by the U.S. Army Corps of Engineers and the U.S. Geological Survey.

2. Strips or Parcels: No remnants of property shall be left which do not conform to minimum lot requirements of the zoning district in

which the property is located, or which are not required for a private or public utility purpose, or which are not accepted by the Board of Council or any other appropriate public body for an appropriate use.

3. Side Lot Lines: The side lot lines of all lots, whenever practical, shall be at right angles to the street which the lot faces or radial to the center of curvature, if such street is curved. In the case of a cul-de-sac on which the lot faces, side lot lines shall be as nearly radial to the cul-de-sac as practical.

SECTION 6.7 PEDESTRIAN WAYS:

A. Location: Where deemed necessary by the planning commission pedestrian ways may be required, and if provided, they should not exceed a fifteen (15) percent grade, unless steps of an acceptable design, as determined by the City Engineer, are to be constructed.

SECTION 6.8 PUBLIC SITES: Where a proposed park or other recreational area, school site, or other public ground identified in the adopted Fort Thomas Comprehensive Plan, is located in whole or in part within the proposed subdivision, the planning commission may require a reservation, as a condition precedent to preliminary plat approval, not to exceed one (1) year, for the purchase of such public ground by the applicable public body.

ARTICLE VII

IMPROVEMENTS

The improvements which are hereby required shall be designed by a registered professional engineer and installed in accord with the provisions of these and other applicable regulations. Prior to the commencement of any project, a preconstruction meeting will be held with the City staff, to discuss the project in regard to procedure, materials, inspections, etc.

SECTION 7.0 MINIMUM DESIGN STANDARDS AND CRITERIA FOR THE STORM WATER MANAGEMENT SYSTEM

The development of a comprehensive Stormwater Management System requires providing two separate and distinct drainage systems, the minor system and the major system.

MINOR SYSTEM

The minor drainage system is for collecting and transporting run-off from frequently occurring storms. It includes open channels, street curbs and gutters, and underground storm sewers, manholes, catch basins, and culverts. This system's purpose is to lessen or eliminate inconveniences and safety and health hazards associated with frequent storms. Except here indicated otherwise, design criteria and requirements of this chapter are directed to the minor drainage system.

MAJOR SYSTEM

The major drainage system is to insure that stormwater run-off which exceeds the capacity of the minor drainage system has a route to follow to the retention basin. It must be recognized that the major drainage system exists even when it is not planned and whether or not physical facilities are intelligently located in respect to it.

A. BASIC DESIGN CRITERIA FOR STORM SEWERS (MINOR SYSTEM)

Storm sewer systems are designed to collect and convey stormwater run-off from street inlets, run-off control structures, and other locations where the accumulation of stormwater is undesirable. The objective is to remove run-off from an area fast enough to avoid unacceptable amounts of ponding, damage and inconvenience.

1. DEGREE OF PROTECTION REQUIRED

The storm drainage system shall be adequate to handle the run-off from storms having various frequencies of occurrence for various degrees of site development, in accord with the following general categories:

a. Conservation, agricultural, and low density residential (2 acre lots or larger) - 10 year frequency

b. all other residential & commercial - 10 year frequency

c. industrial areas - 10 year frequency

d. for concentrated high value areas - 25 year frequency

e. for flood control facilities - 100 year frequency

The run-off computed from these storm frequencies shall be from the area within the subdivision and all other areas draining thereto, with all areas considered as fully developed in accord with the developments planned on the City's Comprehensive Plan.

2. DETERMINATION OF QUANTITY OF RUNOFF

a. Each portion of the stormwater drainage system shall be capable of handling the peak flows of runoff as determined by any acceptable drainage calculation method. For drainage areas less than 300 acres, the preferred method is the "Rational Method" Q = CIA where:

Q = peak runoff rate in cubic feet per second;

C = runoff coefficient varying with perviousness and other characteristics of the drainage area;

I = average intensity of precipitation in inches per hour, varying with frequency of storm occurrence, duration or concentration time, and area of the tributary watershed;

A = area in acres of the tributary watershed.

b. Runoff Coefficients: The runoff coefficient is the portion of the precipitation, expressed as a decimal, that will reach the stormwater drains. In the following table, coefficients vary with zoning type, density, hard surface paving, and slope.

Flat slopes are classified as less than two (2) percent; steep slopes are greater than seven (7) percent. The following runoff coefficients are recommended to be used as a general guide; however, the City Engineer may require calculations to substantiate the run-off coefficient proposed for a particular development.

CHARACTERISTICS	COEFFICIENT C For Slope	
	Flat	Steep
Parks, cemeteries, golf courses, lawns, playgrounds, or unimproved land	0.15	0.35
Residential on 1 acre or more lots	0.30	0.40
Residential on 1/2 acre lots	0.33	0.43
Residential 12,500 sq. ft. lots	0.35	0.45
Residential 9,000 sq. ft. lots	0.37	0.47

Residential 7,500 sq. ft. lots	0.45	0.53
Residential 6,000 sq. ft. lots	0.48	0.55
Multi-dwellings 20,000 sq.ft. lots	0.65	0.71
Neighborhood commercial 10,000 sq. ft. lots	0.70	0.75
Office and Commercial	0.75	0.78
Light Industry	0.80	0.83
Heavy Industry and Shopping Center	0.85	0.87

c. Intensity of Precipitation: The "point" values of average precipitation intensity in inches per hour, at Cincinnati can be extrapolated from Exhibit No. 2-504.5 Kentucky Bureau of Highways "Rainfall Intensity-Duration-Frequency Curves" (see Figure 1). For any given storm duration (concentration time of runoff), the curves show the average precipitation intensity of storms having 2, 5, 10, 25, 50, and 100 year frequencies. These values may be used for drainage tributary areas of 300 acres or less. For larger drainage areas, the average precipitation intensity obtained from Figure One (1) shall be adjusted by the appropriate multiplier in Figure Two (2).

d. Concentration Time (Storm Duration): The time of concentration (TC) in minutes is the estimated time it will take the storm runoff from the most remote part of the area to reach the point of storm drainage system under consideration.

This includes the time for water to flow over roofs, through roof gutters and downspouts, over ground, turfed areas, streets, through street gutters to the nearest inlet of the drainage system, plus the time of flow in the sewer pipes to the point under consideration.

(1) Unless otherwise determined by overland flow charts or nomographs (see Figure 3), the Time of Concentration (TC) for inlets of storm sewer systems may be used as follows:

For residential and undeveloped areas:

Flat slopes - 15 min.

Steep slopes - 10 min.

For all other areas:

Flat slopes - 10 min.

Steep slopes - 8 min.

(2) Flow times in sewers or conduits to the point of design may be determined from the hydraulic properties of the sewers upstream of that point, assuming average full-flow velocity at the proposed sewer slopes.

3. PIPE CAPACITIES

Storm sewer pipes shall be designed to carry peak flows as determined by the methods previously described. Sizes shall be deter-

mined by either Manning's formula, using N = 0.015 for concrete pipes, N = 0.024 for corrugated metal pipe and N + 0.012 for PVC and Polyethylene "smooth flow" pipe.

4. MINIMUM PIPE SIZE

The minimum diameter for storm sewer pipe shall be 12 inches.

5. MINIMUM AND MAXIMUM VELOCITIES

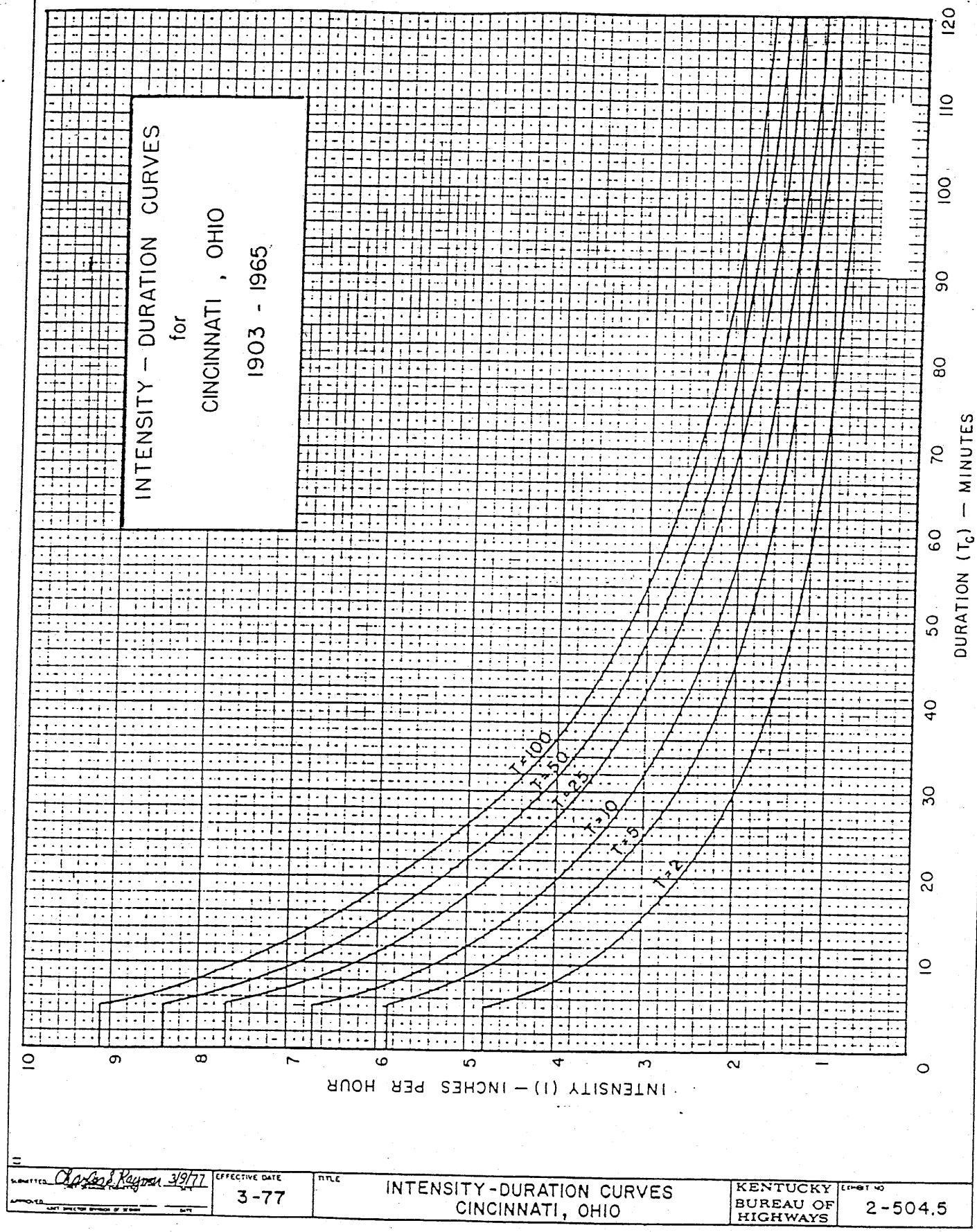
Velocities in storm sewer pipe, when flowing full, shall not be less than 2.0 feet per second nor more than 20 feet per second. For velocities greater than 20 feet per second, special provisions shall be made to protect the sewer pipe against erosion, abrasion, and displacement by shock.

6. GRADIENTS OF PIPE

The sewer pipe shall be laid on gradients so that the velocity (flowing full) shall be kept within the foregoing stated minimum and maximum, unless other special provisions are made. Pipe sizes should be selected so as to avoid large differences in velocities between consecutive reaches.

7. HYDRAULIC GRADES

a. To ensure against surface ponding or street flooding due to surcharging, the hydraulic gradient in any inlet or manhole

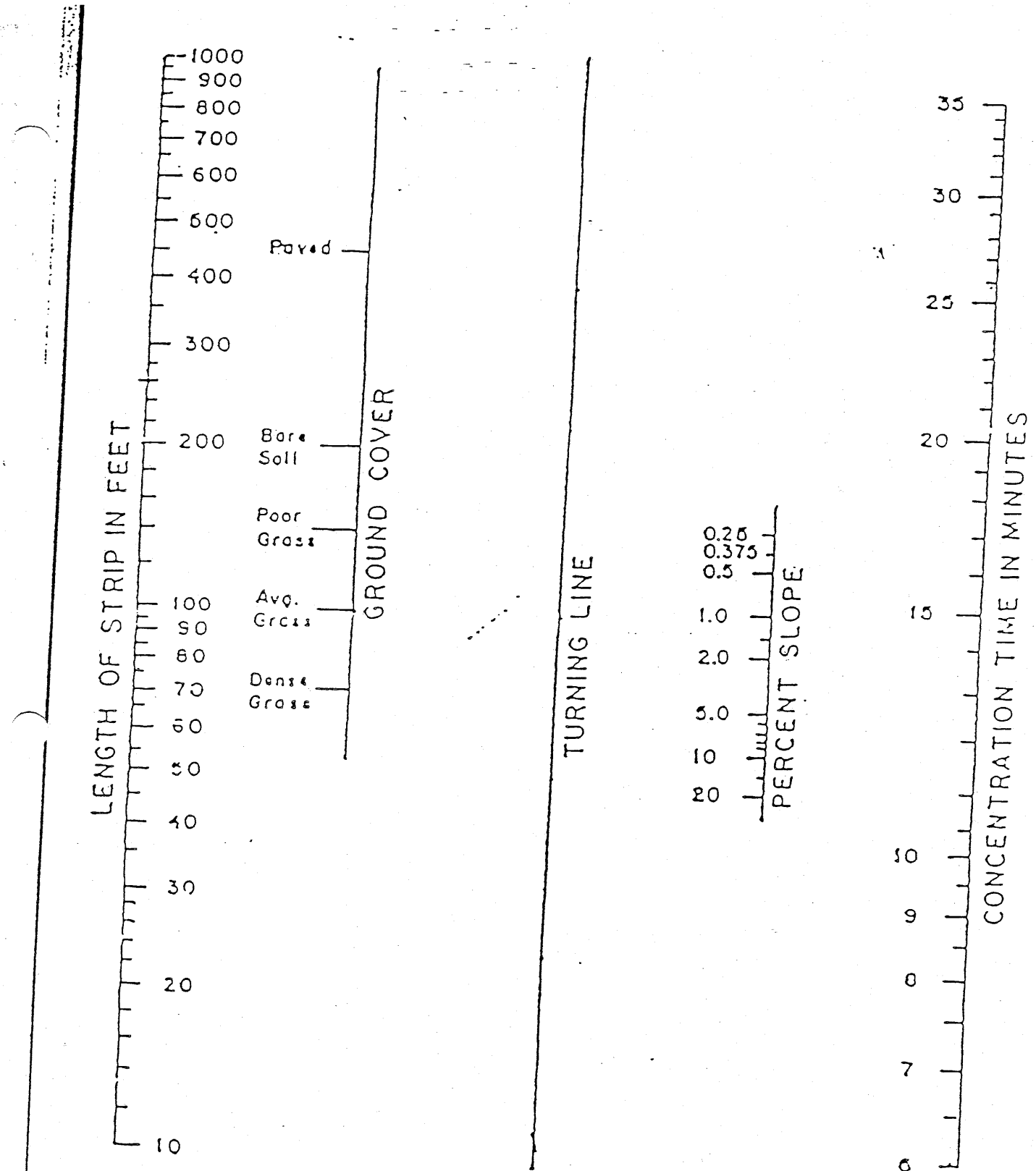


SUBMITTED Charles J. Kayser 3/9/77	EFFECTIVE DATE 3-77	TITLE INTENSITY-DURATION CURVES CINCINNATI, OHIO	KENTUCKY BUREAU OF HIGHWAYS	EXHIBIT NO 2-504.5
APPROVED UNIT DIRECTOR DIVISION OF DESIGN DATE				

FIGURE 2

PRECIPITATION INTENSITY MULTIPLIERS
FOR DRAINAGE AREAS OF 300 ACRES OR MORE

	DURATION OF STORM IN MINUTES (tc)					
Area in Acres	10	20	30	60	90	120
300	1.00	1.00	1.00	1.00	1.00	1.00
400	.993	.993	.993	.995	.996	.99
500	.986	.986	.987	.990	.993	.99
1,000	.997	.997	.978	.981	.985	.98
1,500	.986	.970	.972	.974	.978	.98
2,000	.958	.963	.966	.968	.975	.98
2,500	.948	.953	.957	.962	.970	.97
3,000	.938	.944	.949	.957	.965	.97
3,500	.928	.935	.941	.951	.960	.96
4,000	.918	.927	.933	.945	.956	.96
4,500	.908	.918	.925	.939	.952	.96
5,000	.898	.910	.918	.935	.948	.95
5,500	.888	.901	.911	.930	.945	.95
6,000	.880	.894	.905	.927	.942	.95



OVERLAND FLOW CHART

may not be higher than the inlet grate.

b. Design of all storm sewer appurtenances shall consider the balance of energy plus the entrance losses in all structures having a critical change in horizontal or vertical alignment. Crowns shall be matched whenever a smaller pipe empties into a larger one. In no case shall storm sewer pipe sizes be reduced more than one standard size due to an increase in invert gradient after balancing the energy losses within the structure.

8. MANHOLES

Manholes shall be constructed in accord with Standard Construction Drawings as shown in Appendix "C". Drop manholes may be required to reduce the slope of any sewer that has a velocity that exceeds 20 feet per second. Whenever possible, connections shall be made at manhole inverts to avoid the use of drops.

9. INLETS

a. Capacity: The capacity of the grate on the inlet should not not be less than the quantity of flow tributary to the inlet. Inlets at low points or sags should have extra capacity as a safeguard for street flooding and from flows overtopping the street curb. Curb openings on combination

inlets should be used for overflows in the event that the grate is clogged and shall not be credited toward the inlet capacity in the design calculations. Special inlets may be required for streets with steep gradients to provide the extra capacity such situations require.

b. Type: Combination type inlets (single or double) shall be used and installed in accord with "Standard Construction Drawings" as shown in Appendix "C".

c. Location: Inlet spacing shall be based upon gutter and inlet capacity, street slope, and contributing drainage area. The spacing of inlets should ensure that street drainage generated along continuous grades or in sags will not damage and flood private properties or residential basements. In general, the spacing of combination inlets shall not exceed the following requirements, unless detailed hydraulic computations indicate otherwise and are submitted with construction drawings:

(1) Along continuous grades (less than 2 percent) - 250 feet maximum

(2) Along continuous grades (2 percent and over) - 300 feet maximum

(3) At sag locations (draining less than 2 percent

grades) - 250 feet maximum between inlets or from a high point

(4) At sag locations (draining 2 percent and over grades) - 250 feet maximum between inlets or from a high point

d. Special consideration should be given to storm drainage entering cul-de-sacs. Additional inlets shall be required when drainage areas and/or street slopes are excessive. In addition to an inlet provided of the low point within the cul-de-sac, two (2) additional inlets shall be required along each curb prior to the entrance of the cul-de-sac under either of the following conditions:

(1) for street slopes less than eight (8) percent and draining more than 300 feet of pavement; and

(2) for all street slopes more than eight (8) percent and draining more than 200 feet of pavement.

(3) when the front yards adjacent to the low point in the cul-de-sac drain away from the street, the inlet(s) at the cul-de-sac low point shall be capable of handling the 50 year tributary flow plus the 50 year by-pass flow from upstream inlets.

10. OUTFALLS

When a storm sewer system outfalls into a floodplain of any major water course, the outfall must not be subject to frequent floods or backwaters. Standard headwalls and/or headwalls with wing-walls, including rock channel protection and/or aprons as erosion control, shall be constructed for all outfalls. Suitable baffles or other energy dissipaters shall be provided if maximum velocities for standard erosion protection methods are exceeded. The invert of the first storm sewer appurtenance upstream of the outfall structure shall be above the elevation of the 100 year flood plain.

11. CULVERTS AND BRIDGES

Culverts and bridges shall be designed in accord with the methods given in the "Manual of Location and Design", published by the Kentucky Department of Highways; except that stormwater quantities to be handled by the culverts and bridges shall be determined on the basis described in these standards.

12. HEADWALLS

Standard headwalls including wing walls and aprons where appropriate, shall be constructed at the outfall of all storm sewers in accord with "Standard Construction Drawings" as shown in Appendix "C".

13. OTHER DRAINAGE IMPROVEMENT MEASURES

Other drainage improvement measures may be required to provide the hydraulic characteristics necessary for adequate drainage. These other measures include stream bed clearing, removal of obstructions, stabilization of banks or areas to eliminate erosion, widening, deepening, or realignment of streams, construction of ponds behind dams, or other measures for adequate drainage.

14. SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS

In all other respects, the design, materials, and construction shall be as specified in Sections 601, 611, 709, 710, 714, "State of Kentucky Standard Specifications for Road and Bridge Construction", and in accord with "Standard Construction Drawings", shown in Appendix "C". Non-circular pipe may also be specified. Minimum and maximum allowable cover heights are to be determined by the engineer. The following types of pipe constitute the minimum requirements for storm sewers:

a. Reinforced Concrete Pipe (RCP AASHTO M 170 Class III or Class IV).

b. Type II Aluminized Steel Corrugated Metal Pipe

c. Bituminous Coated Corrugated Aluminum Alloy Pipe (BCCAPEL)

AASHTO M 196 Type I and AASHTO M190 Type A:

36" - 54" Gage 12

60" - 72" Gage 10

B. BASIC DESIGN CRITERIA FOR STORMWATER DRAINAGE CHANNELS, WATER COURSES, AND EROSION CONTROL

Open channels provide many advantages in the management and control of stormwater runoff. Such channels provide for natural infiltration of stormwater into groundwater supply and extend the Time of Concentration (TC), helping to maintain the runoff rate nearer to that which existed prior to development. The objective of open channel flow design is: (a) to determine a channel slope and size that will have sufficient capacity to prevent undue flooding damage during the anticipated peak runoff period; and (b) to determine the degree of protection based on stream velocity to prevent erosion in the drainage channel. Existing drainage channels, which will remain undisturbed, shall not be required to be reconstructed unless additional capacity and erosion control is required.

1. DEGREE OF PROTECTION

Storm water drainage channels and water courses shall be adequate to handle runoff from storms of the frequencies of occurrence shown for the degrees of site development as follows:

a. For all residential, commercial, and industrial areas with drainage areas of less than 1 square mile (640) acres - 25 year frequency.

b. For concentrated high value areas, and for all areas providing drainage flows in excess of the capacity of an 84 inch diameter pipe - 50 year frequency.

c. For main flood control channels - 100 year frequency. The run-off computed from these storms shall be that from the area within the subdivision and from all other tributary areas considered as fully developed in accord with development planned in the local government's comprehensive plan.

2. DETERMINATION OF QUANTITY OF RUNOFF

Each portion of the stormwater system of drainage channels and water courses shall be capable of handling the peak flows as determined by the "Rational Method" previously described in Section 7.0 A.2. or for areas in excess of 300 acres by the Soil Conservation Service T.R. 55 (Technical Release #55) methods.

3. DRAINAGE CHANNEL CAPACITIES

Drainage Channels shall be designed to carry peak flows as deter-

mined by the methods previously described. Channel cross section areas shall be determined by Manning's formula, using a value of N = 0.030 for earth sections, N = 0.020-0.025 for aggregate linings, and N = 0.015 for paved sections.

When open drainage channels require various lining types to attain ultimate design capacity, the earth sections of the drainage channel and its structure shall be designed and constructed to the ultimate design required.

4. EROSION CONTROL FOR DRAINAGE CHANNELS

Runoff flows in open channels may cause accelerated erosion. Such erosion can be controlled by limiting velocities, changing the channel lining, and reshaping the channel to spread the flow of runoff. Methods of controlling erosion in open channels include the following: (1) grass covers or sod, (2) manufactured erosion control mator blankets; (3) stone rip-rap, coarse aggregate, and/or dumped rock channel lining; and (4) reinforced concrete or precast paving. Erosion control for drainage channels shall be provided as follows:

a. Velocities of less than one and one-half (1.5) feet per second (fps). Design velocities should generally be greater than 1.5 fps to avoid excessive deposition of sediments. When flat slopes are unavoidable, concrete paving should be used to accelerate runoff.

b. Velocities between one and one-half (1.5) and four (4) feet per second. The bottom and sides of the earth channel shall be seeded, mulched, and fertilized to an elevation of three (3) feet above the design water surface. Seeding shall be a perennial or annual mixture of grass seeds at a rate of 100 pounds per acre. Acceptable fertilizer shall be applied at a rate of 25 pounds per one thousand square feet. On slopes over five (5) percent, the bottom and sides of the earth channel shall be sodded and pegged to remain in place. Where seeding or sodding is required, and the soil is not capable of supporting vegetation (such as, sandy soil or other clay types) appropriate action shall be taken to bring the soil to an acceptable condition which will support the growth of seed or sod.

c. Velocities over four (4) feet per second. The bottom and sides of the earth channel shall be protected from erosion with an application of stone rip-rap, coarse aggregate, and/or dumped rock channel linings. The type, application thickness and quantities shall be designed by the engineer to a ensure maintenance free and permanent stabilization. Reinforced concrete pavement, at least 4 inches thick, may also be used at bends, changes in alignment, junctions with other ditches, and at other locations where erosion is likely to occur. On slopes over ten (10) percent, consideration should be given to the construction of larger sized channel linings, gabions (wire boxes), or paved chan

nels, with energy blocks or dissipaters to reduce excessive velocities and damage to receiving streams.

d. Consideration shall be given to the construction of other methods of lining for erosion control, including check dams, drops structures, gabions, erosion control mats, etc., subject to approval of the planning commission's duly authorized representative.

5. DRAINAGE CHANNEL OR WATER COURSE RELOCATIONS

In order to minimize hillside slippage near relocated drainage channels or water courses, due to drainage channel depth or character of the earth in the drainage channel fill and side slopes, precautions shall be taken to properly compact the fill and side slopes and consideration given to provision of under drainage, bank protection or reinforcing or other measures.

Additional easement width shall be provided at such possible slide areas.

6. EROSION CONTROL

All graded areas are to be maintained at all times to control erosion and prevent excessive runoff. Several methods used to control soil erosion during development are included in Appendix "C". Drainage swales, silt checks, silt fences, straw bale bar-

riers, temporary retention dams, etc., are to be used during the grading operation. All slopes and graded areas are to be seeded as soon as practical after the grading operation has been completed and/or building development has been finished. Additional erosion control measures, to prevent excessive erosion and excessive runoff, may be required if the developer or builder has not accomplished same.

7. MUD AND DEBRIS

Until lot and street improvements in the subdivision have been completed, the subdivider shall take such measures as are necessary to control erosion of graded surfaces, and to prevent the deposit of soil and debris from graded surfaces onto public streets, into drainage channels or sewers, or onto adjoining land.

8. SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS

In all other respects, the design, materials, and construction shall be as specified in Sections 206, 601, 610, 703, 710, State of Kentucky Standard Specifications for Road and Bridge Construction and in accord with "Standard Construction Drawings" shown in Appendix "C".

C. RESIDENTIAL LOT GRADING AND DRAINAGE

1. LOT GRADING

Lot grading shall be accomplished as follows: Within the limits of the public right-of-way adjacent to street pavements, all final grading for grass strip, sidewalk, and yards to the building structure, shall comply with minimum and maximum grades in accord with typical sections for streets as shown in Appendix "C". For lots that drain toward the street, the area between the right-of-way line and the curb or between the sidewalk and the curb as applicable, shall be graded so that water drains to the street at a minimum grade of 1 inch per foot (approximately 8 percent). All grading behind the street shall be done in a fashion that does not allow ponding of water adjacent to the paved street. For lots that drain away from the street, the area between the right-of-way line and the curb or between the curb and sidewalk as applicable shall be graded so that water drains away from the street at a minimum grade of 1/2 inch per foot (approximately 4 percent). Lot areas outside of the limits of the building structure shall be graded toward or away from the street, so that water drains away from the building at a minimum grade of 1/4 inch per foot (approximately 2 percent) into swales or natural drainage areas.

a. Top Soil: If grading results in the stripping of top soil, top soil shall be uniformly spread over the lots as grading is finished.

b. Trees: As many trees as can be reasonably utilized in the final development plan shall be retained, and the grading adjusted to the existing grade of the trees where practical.

2. SWALES

Swales carry surface runoff from roofs, yards, and other areas to the rear of lots or along common property lines to streets or other drainage areas to prevent ponding of water near building structures or other portions of the lot. Surface drainage swales shall have a minimum grade of two (2) percent and shall be constructed so that the surface water will drain onto a street, storm inlet, or natural drainage area. Swales for handling lot drainage shall be constructed as a part of final lot grading and be seeded and mulched or sodded as soon as possible to prevent erosion.

3. ROOF AND SUBSURFACE DRAINS

Roof downspouts, footing, or foundation drains shall be discharged in accordance with sections 50.05 and 50.06 of the City Code of Ordinances.

D. STORMWATER RUNOFF CONTROL (MAJOR SYSTEM)

1. Introduction. Planning for the major storm is to insure that stormwater runoff which exceeds the capacity of the drainage system has a route to follow that will not cause loss of property or any loss of life. This system exists whether or not it is planned.

2. Criteria.

a. Storm frequencies. Surface runoff for the major drainage system shall be determined using a storm with a frequency of 100 years.

b. Total runoff. The peak discharge of water will be determined as previously outlined in this chapter. The peak discharge may be reduced by an amount equal to the flow in the minor storm system as designed.

3. Points of Consideration

a. All open channels, street cross sections, low points, and culvert entrances will be considered as possible flood areas due to the 100 year storm and will be included as part of the major storm investigation. The investigation may include downstream facilities to a point designated by the City Engineer whether or not these facilities are contained within the project area or controlled by the land developer requesting approvals.

b. All calculations will be submitted with the drainage plan.

4. Additional Controls (Detention/Retention)

a. When in the opinion of the City Engineer, the drainage report indicates that the increased run off due to a development may cause or increase damage to downstream properties,

sediment pollution of public or private waters or hydraulic overloading of existing drainage facilities, the Planning Commission may require the developer to construct storm water detention/retention facilities in order to minimize these effects.

b. When detention/retention facilities are required, the following shall be considered the minimum design criteria:

* Pre-Development Runoff-Existing Conditions

  Calculate the pre-developed site runoff based on 25 year storm frequency and existing ground conditions.

* Post-Development Runoff

  Calculate the proposed ultimate development runoff based on a 50 year storm frequency. Use a weighted coefficient of runoff based on the proposed development with C = 0.95 for impervious areas and C = 0.40 for unpaved and grass areas.

* Storage Requirement

  Provide on-site detention/retention of stormwater equal to the difference between post-development

runoff rate and the pre-development runoff rate, for a period of thirty (30) minutes.

* Discharge from Detention/Retention Basin

The allowable discharge from the detention/73.0 retention basin shall be equal to the pre-development runoff rate minus any runoff which discharges directly from the site.

E. SUBMISSION REQUIREMENTS. STORM WATER MANAGEMENT SYSTEM.

PLANS, PROFILES, AND SUPPORTING DOCUMENTATION TO VERIFY CONFORMANCE WITH THIS SECTION SHALL BE SUBMITTED ALONG WITH THE INFORMATION REQUIRED BY OTHER SECTIONS OF THESE REGULATIONS.

1. Preliminary Plat. In addition to the requirements of Article IV, a plan showing the total area contributing run-off to the Subdivision or Project Area being considered shall be submitted. This plan shall contain, but is not limited to, the following information:

   a. A contour plan showing the outline of all areas outside the project area that contributes run-off to it;

b. Estimated run-off (Q) before and after development for terminal points along natural streams, proposed open channels, and other strategic points such as existing storm sewers or culverts;

c. Location of proposed Detention/Retention areas;

d. Any other information required by the City to clarify intent.

2. Improvement Drawings and Specifications. In addition to the sub-subdivision requirements, the improvement plan for the project area shall contain, but is not limited to, the following information:

a. Diameter, length, slope, type of pipe, and class of all storm sewers, culverts, and subsurface drainage;

b. Invert elevations on profiles of all pipes at terminal points such as manholes, inlets, catch basins, and headwalls;

c. Top of grate elevations of manholes and grate flowlines of catch basins and inlets.

d. Type of catch basin, inlet and manhole (KDOT or City designation);

e. Headwall type (KDOT or City designation);

f. Actual existing and proposed cross sections of open channels showing width of bottom, depth of water, erosion control measures and limits, and side slopes at each point of design along with a profile indicating the longitudinal slope and bottom elevations at the terminal points of design;

g. High and low points indicating the direction of run-off flow along the profile of the roadway;

h. Structural details and design data for Detention/Retention facilities (if required);

i. Details of construction for all structures not included in the City standard construction drawings, or other referenced standards;

j. Easements;

k. Detention/Retention facilities;

1. Any other information required by the City Engineer to clarify intent or design features.

3. Drainage and grading plans. In addition to the improvement plan, provement plan, drainage plan shall be submitted. This plan may be the required improvement plan or a similar plan at a scale of 1 inch = 100 feet or larger showing at least the following additional information:

a. Contours indicating the existing and final grading at vertical increments of no more than 2 feet;

b. Discharge (Q), coefficient of run-off (c) and drainage area

(A) along with the outline of the drainage area for each inlet, catch basin, culvert and open channel point of design and other locations designated by the City Engineer, Drainage areas that lie partially outside the limits of the drainage and grading plan may be delineated on any contour map acceptable to the City Engineer;

c. Discharge (Q) before and after development at strategic points within and at extremities of the Project Area;

d. Delineation of the boundaries and contour elevation, along with the track, of the major drainage system through downstream areas to an adequate outlet even though the outlet may be outside the Project Area;

e. Delineation of the horizontal limits of ponding areas at low points (sags) in the street profile and low points outside the street right-of-way including, but not limited to, culvert headwater, natural stream water surfaces, and sump type inlets for storms with frequencies of 25 years and 100 years;

f. High and low water horizontal limits and contour elevation of Detention/Retention/Sedimentation facilities (when required) along with water surface and control weir elevations, outlet structures, etc.;

g. Areas outside of the Project Area susceptible to sediment deposits or to erosion caused by accelerated run-off;

h. All requirements of this section:

i. Any other information required by the City Engineer to clarify intent, specified requirements, or design features.

4. Supporting data. All data and design information used for the design of drainage facilities and for determining downstream flood information shall be submitted with the drainage and grading plan. To facilitate review and avoid confusion, legends, descriptions, and structure numbering used on design forms or other calculations shall be identical to those used on the improvement plans and the drainage and grading plan. This data shall include but are not limited to:

SUBD. REGS.
TABLE

TABLE 3
IMPROVEMENT REQUIREMENTS BY TYPE OF STREET
SERVING RESIDENTIAL SUBDIVISIONS (F)

TYPE OF STREET	NO. OF LOTS SERVED	RIGHT-OF-WAY (IN FT.)	PAVEMENT WIDTH (IN FT.)	CURB AND GUTTER(C)	SIDEWALKS ALONG STREET(B)	ON-STREET PARKING	MINIMUM FRONT YARD DEPTH REQUIRED (IN FEET)	OFF-STREET PARKING REQUIRED	MINIMUM LOT WIDTH REQUIRED (IN FEET)	MINIMUM PAVEMENT THICKNESS
COURTS - Deadend Typical Optional	Under 7	40 40	25 22	Yes Yes	One side One side	One side None	(A) 35	(A) 4 spaces (E)	(A) (A)	(G)
CUL-DE-SAC-deadend Typical Optional	7-25	50 40	28 25	Yes Yes	Both side Both side	One side None	(A) 50	(A) 4 spaces (E)	(A)	(G)
LOCAL Typical Optional	Under 100	50 40	28 25	Yes Yes	Both sides Both sides (B)	One side None	(A) 50	(A) 4 spaces (E)	(A) 100 (H)	(G)
SUB-COLLECTOR Typical Optional	100-500	50 40	28 25	Yes Yes	Both sides Both sides (B)	One side None	(A) 50	(A) 4 spaces (E)	(A) 100	(G)
COLLECTOR(D) Typical Optional	Over 500	60 60	40 36	Yes Yes	Both sides Both sides (B)	Both side one side	(A) 50	(A) 4 spaces (E)	(A) 100	(G)

NOTE: Where streets are to serve industrial or commercial areas, the pavement design shall be based on a study prepared by the subdivider's engineer, projecting the type of vehicles using the street and traffic volumes and approved by the planning commission's duly authorized representative.

(A) Minimum as per applicable zoning ordinance requirements.

(B) Sidewalks may be permitted on only one side of the street, providing the minimum front yard depth is 50 feet and the minimum lot width is 100 ft. When subdivisions are designed to provide pedestrian walkways to the rear of lots or in other locations other than along the street, the planning commission may waive sidewalks along the streets. In the case where local streets serving less than 25 lots, sidewalks may be permitted on one side of the street.

(C) Shoulders and side ditches may be permitted and designed in accordance with these regulations (see Appendix C) provided the minimum front yard depth is 50 feet, the minimum lot width is 100 feet, the minimum right-of-way is increased by 10 feet, except for collector streets.

(D) Driveway access points along collector streets shall be discouraged, however, if permitted, shall be spaced not less than 200 feet apart.

(E) Individual off-street parking spaces shall be laid out in such a manner to insure that each space has unrestricted ingress and egress to a public street (i.e., not blocked from gaining access to the street via another parked vehicle).

(F) Arterial streets shall be designed in accordance with the requirements of the Kentucky Department of Transportation.

(G) Minimum pavement thickness for portland cement concrete and asphalt concrete shall be designed in accordance with Table 3 and 6, respectively.

(H) In the case where local streets serving less than 25 lots, the minimum lot width shall be as per the applicable zoning ordinance requirements.

a. Weighted run-off coefficient calculations for each contributing area;

b. Pavement drainage computations;

c. Storm sewer computations;

d. Culvert design computations;

e. Open channel computations;

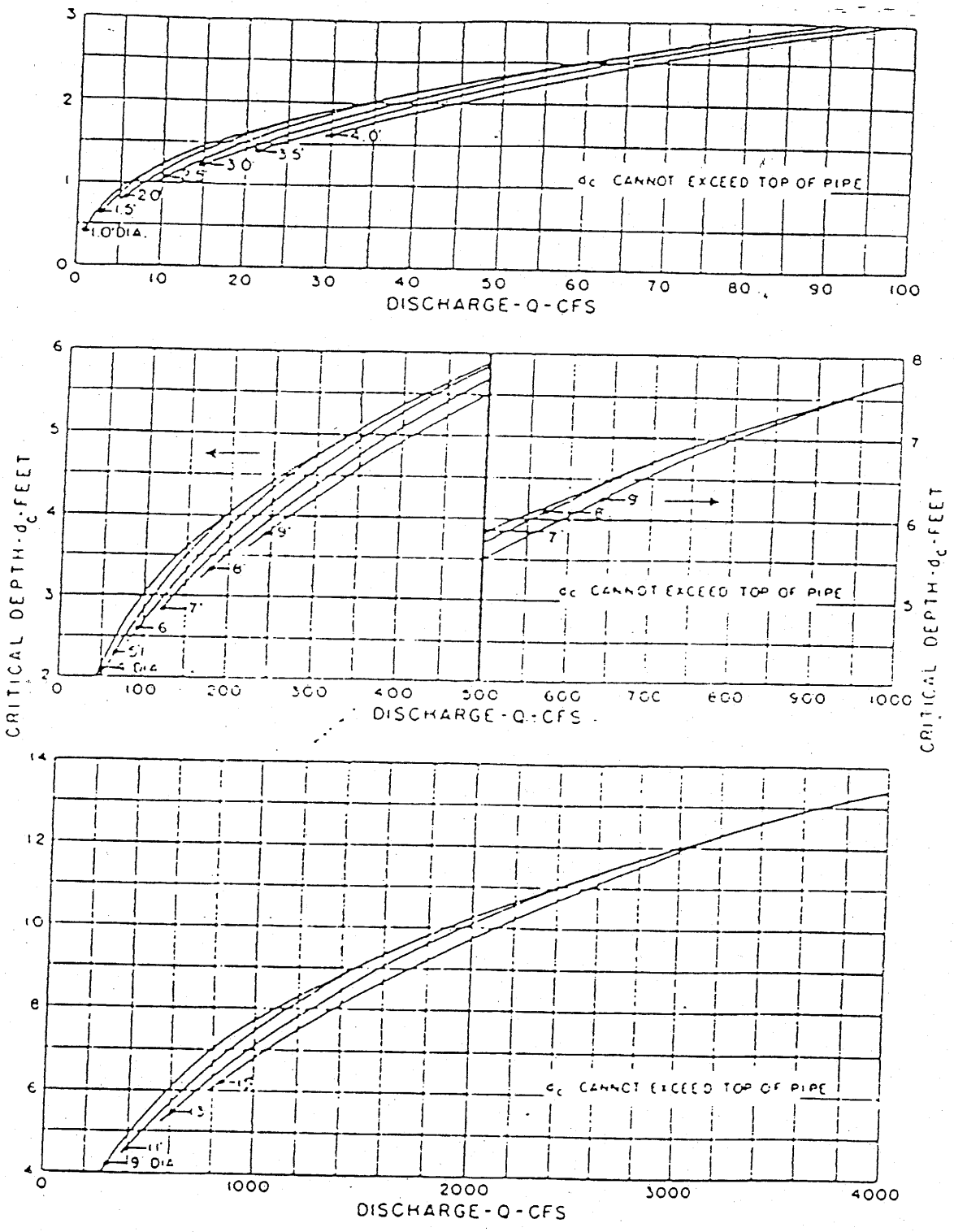
f. Detention/Retention facilities computations (when required);

g. Inlet capacity computations;

h. Any other information required by the City Engineer to clarify intent or design features.

5. General. In order to minimize runoff damage to downstream properties, sediment pollution of public and private waters, and hydraulic overloading of existing drainage facilities, the stormwater runoff from a site after development shall be designed for detention or engineered to address down stream calculations. The quantity of runoff to be detained shall be based upon the "Rational Method", Figures 1 through 4, and the following design criteria:

FIGURE 4



[illegible]	3-77	CRITICAL DEPTH CHART CIRCULAR PIPE	KENTUCKY BUREAU OF HIGHWAYS	4-512.2

a. Pre - development - Existing conditions.

Calculate the site runoff based on a 25 year storm frequency and existing ground conditions using coefficient of runoff based on C = 0.50.

b. Post-development Runoff

Calculate the proposed ultimate development runoff based on a 50 year frequency curve. Use a weighted coefficient of runoff based on the proposed development with C = 0.95 for impervious areas and C = 0.40 for unpaved and grass areas.

c. Storage Requirement

Provide on-site detention of stormwater equal to the difference between post-development runoff rate and the pre-development runoff rate, as required based on calculations.

d. Discharge from Detention Basin

The discharge from the detention basin shall be equal to the pre-development runoff rate minus direct discharge from the site.

6. Waivers

a. Buildings and their related parking areas and other structures, where less than 2 acres of land is to be altered by grading, draining, removing existing ground cover or paving; and, of which 1/2 acre or less will be impervious areas, such as roofs, walks, and parking areas.

b. Other developments, where existing off-site stormwater runoff control facilities will provide the required control criteria, in order to minimize runoff damage to downstream properties, sediment pollution of public and private waters, and hydraulic overloading or existing drainage facilities.

SECTION 7.1 SANITARY SEWER SYSTEM: The subdivider shall construct a sanitary sewage collection system designed to serve adequately all lots in his subdivision plus lines adequate in size to facilitate the orderly development of nearby land which is an integral part of the neighborhood service or drainage area (see Section 7.11 of these regulations) and connect said collection system to a centralized sewerage system, or an approved package treatment plant (surface discharge), except as herein provided.

A. PLANS REQUIRED: The subdivider shall submit plans and specifications prepared by a registered professional engineer, showing the proposed sanitary sewerage system and facilities. Said plans shall show pipe sizes, gradients, type of pipe, invert elevations, location and type of manholes, the location, type and size of all lift or pumping stations,

location, type and capacity of all proposed package treatment plants, and all construction details including such other information as required by the planning commission's duly authorized representative.

B. DESIGN STANDARDS: The design criteria for the sanitary sewerage system shall be based on the "Standards for Sewage Works" prepared by the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers,(Ten [10] States Standard), and in conformance with the requirements and/or guidelines of the State Water Pollution Control Commission. Additionally, sewerage systems shall be in conformance with Fort Thomas Maintenance Standards for maximum depth, backfill, and restoration.

C. MATERIAL SPECIFICATIONS: Material and construction specifications, including testing requirements for all sanitary sewer projects shall be in accordance with the requirements of the Sanitation District # 1 of Campbell and Kenton Counties, except as herein provided.

D. INDIVIDUAL ON-SITE DISPOSAL SYSTEM: Except as herein provided, individual on-site sewage disposal systems may be permitted in accordance with the Department of Housing, Buildings, and Construction - Division of Plumbing Regulations. Furthermore individual on-site sewage disposal systems may be permitted only under the following conditions:

1. Such on-site systems shall be permitted to be located on sites along existing, improved, and newly constructed streets, except that any existing right-of-way and pavement width may be widened where required by these regulations.

2. The site shall contain a minimum area of one (1) acre with a minimum lot width at the setback line of 100 feet.

3. Said system shall be provided with an aerobic type (aerator) treatment plant which will be effective until a connection is made to a centralized sewer system, and the on-site sewage disposal system shall be in accordance with the Department of Housing, Buildings, and Construction - Division of Plumbing Regulations.

In the event that existing sanitary sewer lines are located within a reasonable distance of the site, as determined by the planning commission or City staff, then said site shall be connected to the public sanitary sewer system. Where permitted, under these regulations, all such systems shall also be approved by the appropriate agencies.

SECTION 7.2 WATER SYSTEM: It shall be the responsibility of the subdivider to contact the Campbell County Water District, indicating his proposed layout of the water distribution system, according to the subdivision procedures identified in Article III of these regulations.

A. PLANS REQUIRED: The subdivider shall submit plans and specifications prepared by a registered professional engineer, showing the proposed water system. Said plans shall show line sizes, type of pipe, location of hydrants and valves and other appurtenances, if applicable, supply facilities, booster pumps, elevated or ground-level storage tanks, in

cluding all construction details.

B. DESIGN STANDARDS: The design criteria for the water distribution system shall be as required by the Campbell County Water District. The Fort Thomas Fire Department shall review all designs to ensure fire flow requirements are met.

SECTION 7.3 STREETS:

A. PLANS REQUIRED: The subdivider shall submit plans and specifications prepared by a registered engineer showing the proposed street system. Said plans shall show the proposed right-of-way width, pavement width, location and the proposed alignment, grade, geometric details and typical cross sections of each proposed street, including curbs and gutters and sidewalks (where applicable). Said plans and specifications shall show for each proposed street, design criteria such as street classification, pavement classification and thickness and classification and thickness of base and subbase materials.

In addition, the following information shall be required:

1. The plans and profiles of all surrounding streets which are to connect to a street in the proposed subdivision (for a distance of one hundred (100) feet back from the boundary line of the proposed subdivision).

2. All profiles shall be drawn at a scale not to exceed one inch = 50 feet horizontal and one inch = 10 feet vertical.

3. Elevations shall be shown at all vertical P.I.(s) between P.I.and at 50 feet stations on tangents and 25 feet stations on vertical curves.

4. Elevations shall be tied to a bench mark (U.S.G.S. or other bench marks when available), when, within a reasonable distance (as determined by the City Engineer) and shall be shown on the improvement drawings.

5. Details of curb and gutter, sidewalks, street section and paving.

6. Intersections and cul-de-sac details, including geometrics and detrics and detailed grading.

B. PAVEMENT SPECIFICATIONS: All streets shall be paved with Portland Cement concrete or asphalt concrete and constructed in accordance with the specifications in Appendix "A" or "B" (whichever is applicable) of these regulations.

C. MINIMUM PAVEMENT WIDTHS: Pavement widths shall be measured from back of curb to back of curb, or if no curbs are required, then measurements shall include the entire paved surface. Minimum pavement widths for each street shall be as shown in Table 3 (see page 7-30) and laid out in

the manner indicated by the typical street cross sections shown in Appendix "C".

D. CURBS AND GUTTERS: The subdivider shall construct vertical curbs at curbs at least six (6) inches in height or roll curbs five (5) inches in height, for all residential streets (where applicable) as identified in Table 3. For streets to be constructed of asphalt concrete, curb and gutter shall be constructed according to the typical section detail in Appendix "C".

All curbs and gutters shall be constructed of Portland Cement concrete and in accordance with the specifications in Appendix "A" and typical cross sections in Appendix "C".

E. CURB RADII: The minimum curb radius at intersections shall be as follows:

TYPE OF STREET* INTERSECTION	MINIMUM CURB RADIUS (IN FEET)
Local - Local or Subcollector	25
Subcollector - Subcollector	25
Subcollector - Collector	30
Collector - Collector	30
Arterial - Arterial	**

* In the case of local or collector streets located in commercial or industrial areas, the minimum curb radii shall be increased to fifty (50) feet.

** Shall be based on current design standards of Kentucky Department of Transportation.

F. SIDEWALKS: Sidewalks shall be required as identified in Table 3 of these regulations. Sidewalks shall be constructed of Portland Cement concrete in accordance with the specifications of Appendix "A" of these regulations, at least four (4) inches thick and increased to five (5) inches of thickness when included as part of a driveway. All sidewalks shall be constructed with a minimum width of four (4) feet and this width increased to five (5) feet for streets in multi-family residential, commercial, and industrial areas, where pedestrian traffic volume indicates the need for this additional width. (Sidewalks shall be laid out in the manner indicated by the typical cross sections shown in Appendix "C".)

G. PARKING: Parking on any street where pavement width is less than thirty six (36) feet, shall be limited to one side of the street. Parking lanes shall not be shifted from one side to the other from block to block or where the proposed street is the extension of an existing street the parking lane shall extend continuously on the same side of the street. If practicable, the parking lane shall be located on the opposite side of the street from where the fire hydrants are located.

H. CUL-DE-SAC AND DEAD-END STREETS: Cul-de-sac courts and dead-end streets shall be designed in accordance with the typical design details as per Appendix "C" of these regulations. However, if conditions warrant, other turn around designs may be permitted by the planning commission. If such street is of a temporary nature and a further extension into adjacent land is anticipated, then said turn around, beyond normal street width, shall be in the nature of an easement of the premises included in said turn around, as per the typical design in Appendix C. Such easement may be vacated to abutting property owners when said dead-end street is legally extended into adjacent land. If such dead-end street serves four (4) lots or less, no temporary turn around will be required.

I. CONSTRUCTION OF REQUIRED PAVEMENT WIDTH ON EXISTING STREETS: When a Subdivision is located on only one side of an existing street, and where the pavement width of such existing street is less than that required by these regulations, the subdivider shall be required to construct one-half (1/2) the required pavement width, as per these regulations, along the side fronting his property on such street.

SECTION 7.4 DRIVEWAY APPROACHES: Driveways for residential areas (single and two-family) shall be provided with a minimum width of nine (9) feet and a minimum radius at the curb of five (5) feet, or a five (5) foot flare, for collector streets and a minimum radius at the curb of four (4) feet, or a four (4) foot flare, for local and subcollector streets. In areas of heavier traffic volumes or where special conditions are encountered (Multi-family, industrial, commercial areas), increased driveway widths, plus increased minimum radii or flares may be required by the planning commission. All driveways

within the right-of-way shall be constructed in accordance with the specifications of Appendix "A" or "B" (whichever is applicable) of these regulations. Within the street right-of-way area, driveway grades shall not exceed eight (8) percent. In upward sloping driveways beyond the street right-of-way area, the change in grade shall not exceed twelve (12) percent within ten (10) feet of distance. On downward sloping driveways beyond the street right-of-way area, (entering basement garages), the change in grade shall not exceed eight (8) percent within any ten (10) feet of distance (see design as per Appendix "C").

SECTION 7.5 OFF-STREET PARKING AREAS: Off-street parking areas shall be constructed in accordance with the requirements of the applicable zoning ordinance.

SECTION 7.6 TELEPHONE AND ELECTRICAL UTILITY LINES: All new telephone, Cable T.V. and electrical utility lines shall be installed underground and be in conformance with the appropriate utility company's policy and requirements.

SECTION 7.7 STREET SIGNS:

A. STREET NAME SIGNS: The Board of Council should arrange for installation of street signs at all street intersections. The signs shall conform to the City's specifications and be mounted at a height of approximately seven (7) feet above the top of the curb or the crown of the pavement. They shall be located on diagonally opposite corners on the far right hand side of the intersection for traffic on the more important streets.

B. TRAFFIC CONTROL SIGNS AND DEVICES: The Board of Council shall arrange for the installation of traffic control signs and devices which shall be in conformance with the "Manual on Uniform Traffic Control Devices" as prepared by the Joint Committee on Traffic Control Devices, U.S. Department of Commerce, Bureau of Public Roads.

SECTION 7.8 STREET LIGHTS: The subdivider shall submit a detailed layout of street lighting within the proposed subdivision. The street lighting plan shall include the light fixtures, style, size, height, spacing, intensity of illumination, power source, etc. Street lighting plans shall be reviewed by the Planning Commission and Zoning Administrator and forwarded to the Board of Council for acceptance. Installation costs of improvements shall be at the expense of the subdivider.

SECTION 7.9 PLANTING SCREEN OR FENCES: The Planning Commission may require and permit planting screens, fences, or masonry walls, as required by the applicable zoning ordinance.

SECTION 7.10 MONUMENTATION:

A. MONUMENTS OF RECORD - PERMANENT CONTROL MONUMENTS: The subdivider shall establish or confirm the prior establishment of permanent control monuments along the center line of all streets not to exceed five hundred (500) feet in spacing. Such permanent control monuments shall be designed according to specifications as per Appendix C. All such monuments shall be set in pavement. All permanent control monuments shall be clearly shown on the Final Plat.

B. OTHER MONUMENTS: Other monuments set shall be metal pins of no less no less than one (1) inch diameter and no less than twenty-four (24) inches in length. Monuments of this type shall be set at all of the following locations:

1. At every point of intersection of the outer boundary of the subdivision with an existing or created right-of-way line of any street, railroad, or other way.

At least four (4) - 4 inch square by 30" long concrete monuments monuments shall be placed on the major corners of the subdivision and at common corners of subdivision phases.

Appropriately identified markings shall also be located at each each point along the street curb which intersects with the side lot lines of each lot.

In such cases where the placement of a required monument at its proper location is impractical, a reference monument may be set close by the proper point providing its location and tie to the proper point is properly shown on the final plat.

SECTION 7.11 PLANS FOR FUTURE EXPANSION - EXTRA SIZE AND OFF-SITE IMPROVEMENTMENTS: All improvements shall be installed to satisfy the service requirements for the service or drainage area in which the subdivision is located and the improvements shall be of sufficient capacity to handle the ex

pected development of the overall service or drainage area involved.

A. EXTRA-SIZE IMPROVEMENTS: Where the planning commission has determined that improvements in excess of the size needed to serve just the proposed subdivision are required, the subdivider shall be so notified and arrangements for construction shall be agreed upon.

SECTION 7.12 PLANS REQUIRED FOR THE CONTROL OF EROSION AND SEDIMENTATION: Any developer who intends to make changes in the contour of any land proposed to be subdivided, developed, or changed in use by grading, excavating or removing the natural topsoil, trees, or other vegetative covering thereon, shall submit a plan for erosion and sedimentation control to the City Engineer for approval. The City Engineer may determine that such plans are not necessary.

Such plans, if required, shall contain adequate measures for control of erosion and siltation where necessary, using the guidelines and policies contained herein.

A. REQUIREMENTS:

1. One (1) set of plans for the control of erosion and sedimentation shall be submitted to the planning commission, as per the procedures established in Article III.

2. In the event the planning commission and/or City Engineer gives final plat approval before construction of improvements, as per

Section 3.09,A,2, measures to be taken to control erosion and sedimentation shall be included as per these regulations.

3. The City Engineer shall make periodic inspections of the methods used and the overall effectiveness of the erosion and sedimentation control program.

B. SUGGESTED CONTROL MEASURES: The following control measures should be used for an effective erosion and sedimentation control plan for the area being subdivided:

1. The smallest practical area of land should be exposed at any one time during development.

2. When land is exposed during development, the exposure should be kept to the shortest practical period of time.

3. Where necessary, after grading, temporary vegetation and/or mulching should be used to protect areas exposed during development.

4. Sediment basins (debris basins, desilting basins, or silt traps) should be installed and maintained until ground cover has been completed to remove sediment from run-off waters from land undergoing development.

5. On-Site provisions should be made to effectively accomodate the increased runoff caused by changed soil and surface conditions

during and after development.

6. The permanent final vegetation and structures should be installed as soon as practical in the development.

7. The development plan should be fitted to the topography and soils so as to create the least erosion potential.

8. Wherever feasible, natural vegetation should be retained and protected.

9. Silt fences, straw bale silt traps, straw and bale inlet filters and bale ditch checks.

SECTION 7.13 CONSTRUCTION INSPECTIONS:

A. AUTHORITY AND DUTIES OF CITY INSPECTORS: Inspectors shall inspect all work done and all materials furnished. Such inspection, including final inspection, may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The inspector shall not be authorized to revoke, alter, or waive any requirements of the approved improvement drawings and specifications, but authorized to call to the attention of the contractor, any failure of the work or materials to conform to the approved improvement drawing and specifications. The contractor shall notify the inspector within 48 hours prior to the time when the work is to begin on each phase of construction, such as sewer and water lines, storm sewers and street

paving. The inspector shall begin inspection at the time of construction and maintain inspection as necessary as the work progresses on each phase of the project until all construction is complete. Further, and during the time of construction, any work determined by the inspector not to conform to the requirements of the approved improvement drawings and specifications, shall be referred to and decided upon by the City staff.

SECTION 7.14 CONSTRUCTION RESPONSIBILITIES:

A. COOPERATION OF SUBDIVIDER AND/OR CONTRACTOR: The subdivider and/or contractor shall have available on the project, at all times, two (2) copies of all required plans and specifications. He shall cooperate with the inspector and with other contractors in every way possible. The subdivider and/or contractor shall, at all times, during actual construction, have a competent superintendent acting as his agent on the project. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and he shall receive instructions from the inspector. The superintendent shall have full authority to execute the orders or directions of the inspector. A superintendent shall be furnished irrespective or the amount of work sublet.

SECTION 7.15 FINAL CLEANING UP: Upon completion of the work, the subdivider and/or contractor shall clean up all ground occupied or affected by him in connection with the work and return same to original or better condition.

SECTION 7.16 AGREEMENTS AND GUARANTEES:

A. GUARANTEES: The subdivider may execute and file guarantees with the planning commission and/or staff, in lieu of actual installation or completion of the required improvements, except sidewalks, when requesting approval of the final plat. Such guarantees shall be an amount for the required improvements, as estimated by the subdivider's engineer, and approved by the planning commission and/or City Engineer. The cost estimate shall be based on the amount determined to be reasonably necessary to complete all of the improvements required to be constructed by the subdivider, as specified in the approved improvement drawings and specifications, including the fees for field inspections.

The guarantee shall be in the form of cash, direct or general obligations of the United States Government, a surety bond, or an approved escrow agreement or letter of credit. The guarantee shall be executed by the subdivider as principal, and if a surety bond, shall be executed by a corporation authorized to act as a surety under the laws of the state of Kentucky, as surety. The guarantee shall be an assurance of faithful performance of any and all work and the construction and installation of all improvements required to be done by the subdivider, as specified in the approved improvement drawings and specifications, together with all engineering and inspection fees as required by Section 8.1, of these regulations. The guarantee shall contain the further condition that should the subdivider fail to complete all work and improvements required to be done by him within twenty-four (24) consecutive calendar months of the date of approval of the final plat, or within a

mutually agreed upon extension, but never to exceed twelve (12) consecutive calendar months, that the planning commission or its duly authorized representative, may at its option, cause all required work to be done and improvements constructed. The parties executing the guarantee shall be firmly bound for the payment of all necessary costs thereof. Whenever the subdivider elects to deposit cash or direct or general obligations of the United States Government, or an approved escrow agreement, the planning commission or its duly authorized representative, shall be authorized, in the event of any default on the part of the subdivider or the performance of any work or construction of any improvements for which such guarantees have been deposited, to cause the required work to be done and to withdraw that amount required for payment of all costs thereof.

ARTICLE VIII

ADMINISTRATION AND ENFORCEMENT

SECTION 8.0 ADMINISTRATION: It shall be the responsibility of the planning commission and the City staff, as provided per these regulations.

SECTION 8.1 FEES FOR PRELIMINARY AND FINAL PLATS; GRADING PLANS; IMPROVEMENT DRAWINGS AND SPECIFICATIONS; INSPECTIONS AND OTHER PLATS: The schedule of fees, charges, etc. shall be as established by the Board of Council.

SECTION 8.2 PAYMENT OF FEES: The subdivider shall pay all fees to the Zoning Administrator at the time of submitting plats, improvement drawings and specifications, and grading plans for approval. Said fees shall be paid by check or money order only, and made payable to the City of Fort Thomas.

SECTION 8.3 FEES FOR RECORDING FINAL PLATS IN COUNTY CLERK'S OFFICE: The subdivider shall pay the recording fee as per the requirements of the County Clerk's office.

SECTION 8.4 MODIFICATIONS: The planning commission may grant a modification or waiver to these regulations, as specified herein, providing the planning commission shall find:

A. That unusual topographical or exceptional physical conditions exist; or

B. That strict compliance with these regulations would create an extraordinary hardship in the face of the exceptional conditions; or

C. That the modifications would provide for an innovative design layout of the subdivision.

In granting any modification or waiver to these regulations, the planning commission shall find that said modification or waiver will not be detrimental to the public interest nor in conflict with the intent and purpose of these regulations.

The planning commission may require certain conditions to be met, as may be determined necessary, to accomplish the purpose of these regulations, when modified.

SECTION 8.5 ENFORCEMENT:

A. PLANNING COMMISSION APPROVAL REQUIRED FOR ALL SUBDIVISIONS: No person or his agent shall subdivide any land, before securing planning commission approval of a plat designating the areas to be subdivided, and no plat of a subdivision of land within the planning unit jurisdiction shall be recorded by the county clerk until the plat has been approved by the commission and the approval entered thereon in writing by the chairman.

B. SALE OF LAND IN SUBDIVISION: No person owning land composing a subdivision, or his agent, shall transfer or sell or agree to sell, any lot or

parcel of land located within a subdivision by reference to, or by exhibition, or by any other use of a plat of such subdivision, before such plat has received final approval of the planning commission signed by the chairman of the planning commission and has been recorded. Any such instrument of transfer, sale, or contract shall be void and shall not be subject to be recorded, but all rights of such purchaser to damages are hereby preserved. The description of such lot or parcel by metes and bounds in any contract or instrument of transfer or other document used in the process of selling or transferring same shall not exempt the person attempting to transfer from penalties provided or deprive the purchaser of any rights or remedies he may otherwise have.

C. REVISION OF PLAT AFTER APPROVAL: No changes, erasures, modifications, or revisions shall be made in any plat of a subdivision after final approval has been given by the planning commission and an endorsement is made in writing on the plat, unless the plat is first resubmitted and the changes approved by the planning commission.

D. IMPROVEMENTS IN CONFLICT WITH OFFICIAL MAP: After the Board of Council has adopted an official map, no board, public officer, or authority shall accept, layout, improve, or authorize any improvements to be constructed in any street, including rights-of-way, watercourses, park and playgrounds, public school or other public building sites shown on the official map, except as provided for in KRS 100.293 - 100.317.

E. ENFORCEMENT BY THE PLANNING COMMISSION: The planning commission, shall have a cause of action for all appropriate relief including injunctions

against any governmental bodies or any person who violates any of these regulations.

SECTION 8.6 PENALTIES: Pursuant to KRS 100.991, any person or entity who violates any of these regulations shall, upon conviction, be fined not less than ten dollars ($10.00) but not more than five hundred dollars ($500.00). Each day of violation shall constitute a separate offense.

SECTION 8.7 SEVERABILITY: If any article, section, sub-section, sentence, clause, or phrase of these regulations is, for any reason, held unconstitutional or invalid, such decision or holding shall not affect the validity of the remaining portions hereof, it being the intent to enact each section and portion thereof, individually, and each such section shall stand alone, if necessary, be in force notwithstanding the validity of any other article, section, sub-section, sentence, clause or phrase of these regulations.

SECTION 8.8 APPEALS FROM PLANNING COMMISSION'S DULY AUTHORIZED REPRESENTATIVE: Any subdivider claiming to be aggrieved by any actions by the City Staff may appeal such actions to the planning commission.

SECTION 8.9 APPEALS FROM PLANNING COMMISSION: Any appeal from the planning commission's action may be taken in the following manner;

A. Any person or entity claiming to be injured or aggrieved by any final action of the planning commission may appeal from the action to the circuit court of the county in which the land lies. Such appeal shall be taken within thirty (30) consecutive calendar days after the final

action of the planning commission. Final action shall not include the commission's recommendation made to other governmental bodies.

B. All appeals shall be taken in the appropriate circuit court within thirty (30) consecutive calendar days after the action or decision of the planning commission and all decisions which have not been appealed within thirty (30) consecutive calendar days shall become final. After the appeal is taken, the procedure shall be governed by the rules of civil procedure. When an appeal has been filed, the clerk of the circuit court shall issue a summons to all parties, including the planning commission in all cases, and shall cause it to be delivered for service as in any other law action.

SECTION 8.10 CONFLICT: All regulations, resolutions, orders, ordinances, and/or codes in conflict herewith are hereby repealed on the effective date of these regulations; providing, however, that such repeal shall not affect or prevent the prosecution or punishment of any person for any action done or committed in violation of any such Subdivision Regulations, Order, Resolutions, and/or Amendments thereto, hereby repealed prior to the effective date of these regulations.

ARTICLE IX

ADOPTION, AMENDMENT, AND EFFECTIVE DATE

SECTION 9.0 PUBLIC HEARING: Before adoption of these subdivision regulations, or any amendments thereto, by the planning commission, a public hearing shall be held by the planning commission. A public notice of the time and place of the public hearing shall be published in a newspaper of general circulation in Campbell County, in accordance with Kentucky Revised Statutes Chapter 424.

SECTION 9.1 EFFECTIVE DATE: These subdivision regulations shall take effect and be in force upon their adoption as provided for in KRS Chapter 100.

ADOPTED BY THE FORT THOMAS
PLANNING AND ZONING COMMISSION,
STATE OF KENTUCKY

DATE:_____

CHAIRMAN:_____

SECRETARY:_____

APPENDIX "A"

CEMENT CONCRETE FOR STREET, CURB AND GUTTER, SIDEWALK AND DRIVEWAY CONSTRUCTION.

The work covered by these specifications consists of furnishing all labor, equipment, and materials, and performing all operations in connection with the construction of air-entrained Portland Cement concrete pavement in accord with these specifications and the applicable improvement drawings.

The cement concrete pavement work shall consist of a single course of cement concrete, including reinforcement and longitudinal and transverse joints, where required, constructed on a prepared subgrade in conformity with the lines, grades, and cross sections shown on the plans.

The data included herewith is based upon general soil conditions which exist in the area. These general soil conditions, representing approximately 75 percent of the soils in the area, are clayey overburden soils, described as lean to moderately plastic silty clays, classified according to the Unified Soil Classification System as CL soils. Any site which is made up of soils substantially different should be evaluated independently by a qualified Geotechnical Engineer. This work should consist of drilling, testing, and an engineering evaluation of all field and laboratory data, in light of the proposed design.

ITEM 1.0 GRADING

This term shall consist of all grading above or below subgrade elevations of whatever nature required to bring the street to proper subgrade elevations, including necessary excavation for curb, gutter, sidewalk, construction of embankments, excavation and proper sloping of all cuts, and other work incidental thereto.

1.1 EXCAVATIONS: All excavations shall be made to approximate grade or subgrade elevations consistent with approved plans. Excavations shall not be steeper than a cut slope of 3 horizontal to 1 vertical.

1.2 EXCAVATION BELOW SUBGRADE: Whenever excavations below subgrade elevation to remove spongy or unstable material, organic matter or other materials is required, the contractor shall remove same and shall replace with compactible soils as per Item 1.3. The excavation can be backfilled with soils that were removed, provided they are clean clayey soils free of organic matter and other deleterious material, aerated and dried to near optimum moisture content or clean clayey borrow soils that have moisture contents near optimum moisture content.

1.3 CONSTRUCTION OF EMBANKMENT: All surface vegetation and heavy root system shall be removed to eliminate all vegetation from the area upon which the embankment is to be constructed. Soils so removed shall not be used in construction of embankment. These materials shall be stockpiled and respread across scarified areas after the scarified areas have been brought to within inches of finished grade.

Embankments less than ten (10) feet in height shall be constructed of approved soils to approximate subgrade elevation in shallow level layers, 6 to 8 inches, within three (3) percent of optimum moisture content on the dry side of the curve or within four (4) percent of optimum moisture content on the wet side of the curve, compacted with an appropriate type of compaction equipment to a density not less than 98 percent of maximum density, as determined by the standard Proctor moisture-density test (ASTM D698-78 or AASHO T-99) or 90 percent of maximum density as determined by the modified Proctor moisture-density test (ASTM D1557-78 or AASHO T-180). Embankments greater than ten (10) feet in height shall have soils below ten (10) feet compacted to 95 percent or 87 percent of maximum density, standard and modified Proctor, respectively. All soils placed in areas involving public improvements shall be constructed to slopes no steeper than 2.5 horizontal to 1 vertical and flatter where possible for ease of maintenance.

1.4 BACKFILL: Clayey soils or granular soils used to backfill utility excavations for storm, sanitary sewer and water system crossings beneath the pavement and within three (3) feet on either side of the pavement shall be compacted to the densities stated in Item 1.3. Under no conditions shall granular backfill be flushed with water to obtain compaction.

1.5 SUBGRADE: The subgrade is defined as the top one (1) foot of the soil profile at finished grade prior to placing the pavement. This top one (1) foot of soil will consist of: a) compacted fill placed

for embankments as outlined in Item 1.3; b) undisturbed soils in the transitional areas from cut to fill immediately below the topsoil; or c) undisturbed soils at depths greater than 3 feet below the original ground surface in cut areas. The top one (1) foot of subgrade shall be compacted to 98 percent of maximum density as determined by the standard Proctor moisture-density test (ASTM D698-78 or AASHO T-99) or 90 percent of maximum density as determined by the modifier Proctor moisture-density test (ASTM D1557-78 oar AASHO T-180) within three (3) percent of optimum moisture content on the dry side of the curve or four (4) percent of optimum moisture content on the wet side of the curve immediately prior to placing the pavement. In transitional areas from cut to fill, the soils have been subject to seasonal changes of freezing and thawing and wetting and drying. These soils will exist at moisture contents well above optimum moisture content and at densities on the order of 60 to 80 percent of maximum density (ASTM D698-78). These soils shall be scarified, aerated, and dried in order to obtain the specified percent compaction for subgrade. Soils in cut areas, 3 feet below original grade, will exist at moisture contents above optimum moisture content and at densities on the order of 90 percent of maximum density (ASTM D698-78). These soils shall be scarified, aerated, and dried in order to obtain the specified percent compaction for subgrade.

Any soft or yielding areas, resulting from high moisture content that are encountered at the time of construction shall be scarified, aerated, and dried to reduce the moisture content nearer to optimum

moisture content, then recompacted to the specified density. The subgrade shall be shaped to plan elevation and cross section. Immediately prior to placing the concrete, the subgrade shall be checked for conformity with the cross section shown on the plans by means of an approved template on the side forms. If necessary, the materials shall be removed or added, as required, to bring all portions of the subgrade to correct elevations. The subgrade shall be thoroughly compacted and again checked with the template. Concrete shall not be placed on any part of the subgrade which have not been checked for correct elevation. The subgrade shall be clean of loose or wet material prior to place concrete.

1.6 EQUIPMENT FOR COMPACTION OF BACKFILL, EMBANKMENT, AND SUBGRADE: Any compaction equipment capable of producing the required embankment and subgrade densities, without lamination, will be permitted. Clayey type soils shall be compacted with a kneading type compaction equipment, such as a sheepsfoot roller. Cohesionless soils shall be compacted with vibratory type equipment, such as a vibrating plat or roller. All compaction equipment shall be in good condition and shall be operated efficiently to assure uniform compaction.

1.7 SUBGRADE FOR SIDEWALKS AND DRIVEWAYS: Subgrade for sidewalks and driveways, within the limits of the right-of-way, shall comply with Item 1.5.

1.8 EQUIPMENT OPERATED ON STREETS: The contractor shall be permitted to operate only pneumatic tired equipment over any paved sheet

surfaces and shall be responsible for correcting any damage to street surfaces resulting from the contractor's operation. Paved streets, adjacent to new development, shall have all loose soil or mud removed at the end of each day's work.

1.9 UTILITIES: Special precautions shall be taken by the contractor to avoid damage to existing overhead and underground utilities. Before proceeding with the work, the contractor shall confer with all public or private companies, agencies, or departments that own or operate utilities in the vicinity of the construction work. The contractor shall be diligent in his efforts to use every possible means to locate existing utilities.

1.10 SOIL DENSITY TESTS: Soil density tests, including moisture - density tests (ASTM D68-78 or ASTM D1557-78) and field density tests (ASTM D1556-64 or ASTM D2922-78) are required to determine the percent compaction in accord with the following:

(1) Embankments - a minimum of one (1) test for each three (3) feet in elevation per 400 lineal feet or every 2500 cubic yards, or fraction thereof, of embankment section;

(2) Utility backfill excavations for storm, sanitary sewer and water system crossings - a minimum of one (1) test for each two (2) feet in elevation per 100 lineal feet, or

fraction thereof, of utility trench open cut beneath street subgrade and within three (3) feet outside of street pavements;

(3) Subgrades - a minimum of one (1) test per 100 lineal feet for streets 500 lineal feet or less or one (1) test per 200 lineal feet for streets over 500 lineal feet at each of the following locations, where applicable:

(a) compacted fill placed for embankments

(b) undisturbed soils in transitional areas from cut to fill immediately below the topsoil; and

(c) undisturbed soils at depths greater than 3 feet below the original ground in cut areas.

Density tests of soil embankment, utility excavations, or subgrade are not applicable when at least one of the following conditions exist:

(1) more than 5 percent of the material contains greater than one (1) inch sieve size particles; or

(2) more than 60 percent of the material contains greater than No. 4 sieve size particles except DGA (dense graded aggregate).

Proof of conditions (1) or (2) shall be performed by at least one (1) graduation test by a recognized testing laboratory and mailed directly to the inspector.

All soil density testing shall be at the expense of the developer. The results of these tests shall be mailed directly to the developer, design engineer, inspector, and the contractor. The results of all soil testing shall be compared to the densities, stated in Items 1.3, 1.4, 1.5, and 1.7 of these regulations. Any deficiencies found in construction work must be remedied in the field or resolved between the developer, contractor, and inspector, subject to approval by a qualified registered professional engineer.

ITEM 2.0 MATERIALS

Concrete shall be composed of Portland Cement, air-entraining agent, aggregates, and water.

2.1 PORTLAND CEMENT: Cement of the type specified shall conform to requirements of the current ASTM specifications for Portland Cement Type I or Type III (Designation C-150). Cement, which for any reason has become partially set or which contains lumps of caked cement, shall be rejected. Either packaged or bulk cement may be used.

2.2 AIR-ENTRAINING AGENT: Air-entraining agents shall conform to the requirements of the current ASTM specifications for air-entraining

admixtures for concrete (Designation C-260).

2.3 ADMIXTURES FOR CONCRETE: Chemical admixture of the type specified shall conform to requirements of the current ASTM specifications for Admixtures of Type A and Type D (Designation C-494). No pozzolans (Fly Ash) will be allowed as substitute for cement.

2.4 AGGREGATES: All aggregates for concrete shall meet the current standard requirements for concrete pavements of the Kentucky Department for Transportation. Bureau of Highways, or the current ASTM specification for concrete aggregates (Designation C-33).

Aggregates shall be so handled that moisture content and gradation are reasonably uniform and do not change appreciably from batch to batch or hour to hour.

No aggregates shall be used which have become contaminated or intermixed. Frozen aggregates or aggregates containing frozen lumps shall be thawed before use.

2.5 WATER: Water used in mixing or curing concrete shall be clean and free from injurious amounts of oil, acids, salt, alkali, or organic materials or other substances harmful to concrete. Normally, water from public supplies, which is suitable for drinking, is satisfactory.

2.6 REINFORCING STEEL: Reinforcing steel, if specified, shall conform

to current Standard Specifications of the Kentucky Department of Transportation, Bureau of Highways.

2.7 JOINTS:

2.7.1 EXPANSION JOINTS: Expansion joints shall be non-extruding performed joint fillers and shall conform to current Standard Specifications of the Kentucky Department of Transportation. The selection of the type will be at the contractor's option.

2.7.2 JOINT SEALING COMPOUND: The material used for filling and sealing cracks and/or joints shall be W. R. Meadows Sealtight #164 - Hot Pour Rubber Asphalt Sealer, W. R. Meadows Sealtight Hi-Spec Hot Pour Joint Sealing Compound or approved equal.

ITEM 3.0 BATCHING

Batching shall conform to Kentucky Department of Transportation, Bureau of Highways Specification 601.08 through 601.18.

3.1 STRENGTH OF CONCRETE: Finished concrete shall attain a minimum expected strength at 28 days of 4000 pounds per square inch compressive strength and/or 570 pounds per square inch flexural strength "models of rupture".

At least three (3) test cylinders shall be made for each day's

placement for each 100 cubic yards, or portion thereof, by a recognized testing laboratory. One (1) cylinder shall be broken at 7 days and two (2) cylinders 28 days. The results of these tests shall be sent directly to the Inspector, Design Engineer, Contractor, and concrete supplier.

The fabricating, curing, breaking, and reporting the test cylinders, slump test, and air content test shall be made at the contractor's expense.

3.2 PROPORTIONING CONCRETE: The proper proportions of cement, water, and aggregates shall be determined in accordance with ACI Standard 613, "Recommended Practice for Selecting Proportions for Concrete", or the Portland Cement Association booklet, "Design and Control of Concrete Mixtures".

The entrained air shall be obtained by using an air-entraining agent. All concrete shall be air-entrained in accordance with the following:

MAXIMUM SIZE OF AGGREGATE (INCHES)	AIR CONTENT PERCENT BY VOLUME
1-1/2, 2, 2-1/2	5 + 1%
3/4, 1	6 + 1%
3/8, 1/2	7-1/2 + 1%

3.3 CONSISTENCY: The slump of the concrete shall not exceed four (4) inches. Consistency shall be measured as described in the current ASTM Standard Method of Slump Test for Consistency of Portland Cement Concrete (Designation C-143 or the Method of Test for Ball Penetration for Portland Cement Concrete, Designation C-360).

3.4 READY-MIXED CONCRETE: All ready-mixed concrete shall be furnished in accordance with current ASTM specifications for ready-mixed concrete (Designation C-94). Any concrete, which is not plastic and workable when it reaches the subgrade, shall be rejected.

When construction conditions are such that it is absolutely necessary for trucks hauling concrete to operate on the grade between forms, they shall not back over previously deposited fresh concrete without the approval of the inspector.

3.4.1 TIME OF DELIVERY: Concrete shall be delivered and discharged from a truck mixer or agitator truck within a period of one and one-half (1-1/2) hours at air temperatures up to eighty-five (85) degrees Fahrenheit, and one (1) hour at air temperatures higher than eighty-five (85) degrees Fahrenheit, after introduction of the water to the cement and aggregates or the cement to the aggregates. Delivery tickets shall have this time clearly shown thereon, and the inspector shall check to be certain that deliveries made within the period specified.

3.4.2 TYPE OF DELIVERY EQUIPMENT: Concrete shall be delivered in truck mixers or agitator truck (i.e., trucks providing mechanical agitation by revolving drums or revolving blades in a stationary drum) operated after time required for thorough mixing of the concrete at the speed designated by the manufacturer as agitating speed.

3.5 JOB-MIXED CONCRETE: Job-mixed concrete shall be mixed in a drum mixer, which shall conform to the concrete paving mixer standards of the Mixer Manufacturers Bureau of the Association General Contractors of America. The mixer shall be capable of combining the aggregates, cement, and water into a thoroughly mixed and uniform mass within the specified time and of discharging the material without segregation.

The entire contents of the drum shall be discharged before recharging. The volume of the mixed materials per batch shall not exceed the manufacturer's guaranteed capacity of the mixer.

3.5.1 ADJUSTING SLUMP OF CONCRETE: The mixing of each batch shall continue for not less than one minute after all material, except water, are in the mixer. The mixer shall rotate at the rate recommended by its manufacturer. The mixer shall be provided with a batch timing device which shall be subject to inspection and adjustment by the inspector.

3.6 ADJUSTING SLUMP OF CONCRETE: Measured amounts of water can be

added. After adding water, an additional slump test must be made.

ITEM 4.0 MEASURING AIR CONTENT

The air content shall be measured in accordance with ASTM Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method (Designation C-231) or ASTM Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method (Designation C-173).

ITEM 5.0 FORMS

Forms may be made of wood or metal and shall have a depth equal to or greater than the prescribed edge of thickness of the pavement. Each section or form shall be straight, free from bends or warps.

The method of connections between the form sections shall be such that the joint thus formed is tight and free from movement in any direction.

Forms shall be of such cross sections and strength and so secured as to resist the pressure of the concrete when placed, and the impact and vibration of any equipment which they support without springing or settlement.

5.1 SETTING FORMS: The subgrade under the forms shall be compacted and shaped so that the form set shall provide the specified elevation. The supply of forms shall be sufficient to permit their remaining in place for sufficient time so, when removed, the concrete will not be displaced. All forms shall be cleaned and oiled

each time they are used.

5.2 GRADE AND ALIGNMENT: The alignment and grade elevation of the forms shall be checked by the contractor immediately ahead of concrete placement and necessary corrections will be made. Any forms that have been disturbed or subgrade that has become unstable shall be corrected and forms reset and rechecked. Any variations in grade and alignment shall be subject to approval of the Design Engineer and Inspector prior to placing concrete.

ITEM 6.0 PLACE CONCRETE

The concrete shall be mixed in quantities required for immediate use and shall be deposited on the subgrade to the required depth and width of the construction lane in successive batches and in a continuous operation, without the use of intermediate forms or bulkheads. The concrete shall be placed as uniformly as possible, in order to minimize the amount of additional spreading necessary. While being placed, the concrete shall be vibrated and compacted with suitable tools, so that the formation of voids or honeycomb pockets is prevented.

No concrete shall be placed around manholes or other structures until they have been brought to the required grade and alignment. Additional tamping and compaction will be required after raising manholes.

6.1 COLD WEATHER CONCRETING: , Concrete may be placed when the air temperature in the shade and away from artificial heat is thirty-five (35) degrees Fahrenheit or higher. No concrete shall be placed upon

frozen subgrade. Concrete shall be protected from freezing for a period up to seven (7) days.

6.2 HOT WEATHER CONCRETING: Except by approval of the inspector, concrete placing shall cease if the temperature of the plastic concrete cannot be maintained at ninety (90) degrees Fahrenheit or lower.

To facilitate the placement of concrete in hot weather, a retarding chemical admixture Type B or D, in conformance with ASTM C-494, may be used.

ITEM 7.0 CONSOLIDATING AND FINISHING

The pavement shall be struck off and consolidated with a mechanical finishing machine or by hand-finishing methods. When a mechanical finishing machine is used, the concrete shall be struck off at such a height that after consolidation and final finishing, it shall be at the elevation as shown on the plans.

The finishing machine shall be provided with a screed, which will consolidate the concrete by pressure, vibration or both. The concrete shall be brought to a true and even surface, free from rock pockets. The edge of the screeds along the curb line may be notched out to allow for sufficient concrete to form the integral curb. Hand-finishing tools shall be kept available for use in case the finishing machine breaks down.

When hand-finishing is used, the pavement shall be struck off and consolidated

by a vibrating creed to the elevation as shown on the plans. When the forward portion of the vibrating screed is stopped, the vibrator shall be shut off; it shall not be allowed to idle on the concrete.

7.1 SCRAPING AND STRAIGHTENING: The pavement may be required, by the inspector, where applicable, to be scraped with a straightedge, equipped with handles long enough to permit it to be operated from the edge of the pavement.

When irregularities are discovered, they shall be corrected by adding or removing concrete. All disturbed area shall be floated with a wooden or metal float not less than three (3) feet long and not less than six (6) inches wide and again straightedged.

7.2 EDGING: Before final finishing is completed, and before the concrete has taken its initial set, the edges of the slab and curb shall be carefully finished with an edger.

7.3 FINAL SURFACE FINISH: A burlap drag shall be used as the final finishing method for concrete pavement. The drag shall be at least three (3) feet in width and long enough to cover the entire pavement width. It shall be laid on the surface of the pavement and dragged forward in the direction in which the pavement is being laid. The curb shall have the same final finish as the pavement.

The final surface of the concrete pavement and curb shall have a uniform gritty texture, free from excessive harshness, and true to

the grades and cross section shown on the plans. The inspector may allow changes in the final finishing procedures, such as a broom finish to allow the desired final surface texture.

ITEM 8.0 INTEGRAL CURB

The integral vertical and rolled curb shall be constructed with or immediately following the finished operation. Special care shall be taken so that the curb construction does not lag the pavement construction and form a "cold joint".

When integral vertical curbs are required along the edges of all street pavement, depressed curbs two (2) inches above gutter line shall be provided at all driveway entrances and at such other locations as designated on the approved plans.

In placing curb concrete, sufficient spading shall be done to secure adequate bond with paving slab and eliminate all voids in the curb.

Curbs shall be formed to the cross section in accordance with Appendix "C".

ITEM 9.0 CURING

Concrete shall be cured by protecting it against loss of moisture, rapid temperature change, from rain, flowing water, and mechanical injury for a period of not less than five (5) days from the beginning of the curing operation. Moist curing, waterproof paper, white pigmented liquid membrane compound, or a combination thereof, may be used for curing. Immediately after finishing

operations have been completed, the entire surface of the newly placed concrete shall be covered by the curing medium which is applicable to local conditions and approved by the inspector.

The edge of concrete slabs exposed by the removal of forms shall be protected immediately to provide these surfaces and to prevent injury to concrete edges.

The covering material shall be kept free of any substances which may be detrimental to the surface of the concrete. The initial curing medium shall be effective and shall be applied so as to prevent checking, cracking, and the appearance of dry spots in the surface of the concrete. The contractor shall have the equipment needed for adequate curing at hand and ready to install before actual concrete placement begins. In all cases in which the curing medium requires the use of water, the curing shall have prior right to all water supply. Failure to provide sufficient cover material of the type selected, failure to maintain saturation for the entire curing period in the moist-curing methods, lack of water to adequately care for both curing and other requirements, or other failure to comply with curing requirements shall be cause for immediate suspension of concreting operations.

9.1 MOIST CURING: Moist curing shall be accomplished by covering of burlap, cotton mats, or other approved fabric mat used singly or in combination.

Curing mats shall be thoroughly wet when applied and kept continuously wet and in intimate contact with the pavement surface for the duration of the moist curing period. Other fabric mats shall

conform in design and shall provide a curing medium at least equal to cotton mats. Cotton mats, other fabric mats, and burlap mats and burlap strips shall be furnished in the widths or lengths, after shrinkage, required to cover the entire width and edges of the pavement lane. Mats or burlap shall be lapped at joints between adjacent sheets to prevent drying at this location. Moist curing, when used as initial curing, shall be continued for not less than twenty-four (24) hours. Type and weight of cotton mats for curing concrete shall conform to ASTM C-440 or AASHO M-73. Burlap strips shall conform to ASSHO M-182.

9.2 WATERPROOF PAPER AND POLYETHENE SHEETING CURING: The surface of the concrete shall be wetted with a fine spray of water and then covered with the waterproof paper or sheeting. The paper or sheeting shall be in pieces large enough to cover the entire width and edges of the slab and shall be lapped not less than twelve (12) inches. Paper or sheeting shall be adequately weighted to prevent displacement or billowing due to wind. Paper or sheeting folded down over the side of the pavement widths shall be secured by a continuous bank of earth. Tears or holes appearing in the paper or sheeting during the curing period shall be immediately repaired.

9.3 LIQUID MEMBRANE CURING COMPOUND: Pigmented liquid membrane curing compound shall meet the specifications under ASTM C-309. The curing compound must be applied to cover the surface completely and uniformly at a rate which will achieve the performance requirement

specified in AASHO specifications M-148 or ASTM Designation C-309. This method of curing shall be applied immediately behind the final finishing operation or after the initial curing when a combination of methods are used. Failure to provide complete and uniform coverage at the required rate will be cause for discontinuance of this method of curing and the substitution of one of the other approved methods. The compound shall be kept agitated to prevent the pigment from settling. Special care shall be taken to apply the curing compound to the pavement edges immediately after the forms have been removed.

ITEM 10.0 PAVEMENT JOINTS (all joints shall be constructed as per details in Appendix "C")

Concrete pavement shall include expansion, contraction, and longitudinal joints. Transverse joints are expansion and contraction joints which shall be continuous across the pavement lane including the curb. Longitudinal joints are parallel to the pavement lanes. Construction joints are necessary when the placement of concrete is delayed. The location of transverse constriction joints may be either planned (coincidental with a contraction joint) or emergency (not coincidental with a contraction joint). In general, the location of longitudinal joints shall be centered between pavement lanes except for street widths 30 feet and wider. The placement and construction of all pavement joints shall comply with joint details in Appendix "C" and shall be shown or referenced on the improvement drawings in accord with the following criteria:

10.1 EXPANSION JOINTS

Expansion joints shall be Type 1. Filler material shall conform to Item 2.7.1 of these regulations and extend the entire width of the pavement. All dimensions and spacing shall be shown on the plans or referenced herein. The filler shall be held accurately in place during the placing and finishing of the concrete by a bulkhead, a metal channel cap or other approved method. Expansion joints shall be installed at the following locations: (1) in pavement sections entering a curve at the PC and PT; (2) at all street intersections at the point of curvature of the turning radii entering the intersection; and (3) at cul-de-sacs or turnarounds at the point of curvature of the first turning radii approaching the turnaround. In no case shall the expansion joint spacing exceed 300 feet.

No concrete shall be left above the expansion material or across the joint at any point. Any concrete spanning the ends of the joint next to the forms shall be carefully cut away after the forms are removed.

Before the pavement is opened to traffic, the groove above the filler shall be cleaned and sealed with joint sealing material specified in Item 2.7.2 of these regulations.

10.2 CONTRACTION JOINTS

Transverse contraction joints shall be Type 2. They may be sawed

or grooved with a metal jointing tool, equal to a depth of one-fourth (1/4) of the pavement thickness. If the pavement is grooved with a metal jointing tool, special care should be taken to prevent surface irregularities at the joint location.

The spacing of undoweled contraction joints shall be specified by the design engineer and shown on the plans or referenced herein. In no case shall the contraction joint be spaced at intervals greater than a distance of fifteen (15) feet between joints.

If sawed joints are specified, they shall be sawed within a time frame of between four (4) hours and eight (8) hours following placement of each pavement section; however, depending upon temperatures, weather conditions, and other factors affecting setting times, variations to these time frames may be required to ensure that joints are sawed early enough to control cracking, but late enough to prevent any damage by blade action to the slab surface and to the concrete immediately adjacent to the joint.

10.3 CONSTRUCTION JOINTS

Transverse construction joints shall be used wherever the placing of concrete is suspended for more than thirty (30) minutes. A transverse construction joint shall be Type 3, with smooth bars if the joint occurs at the location of a contraction joint. A transverse construction joint shall be Type 4 with deformed tie bars if the joint occurs at any other location.

10.4 LONGITUDINAL JOINTS

Longitudinal joints between lanes shall be Type 6 of the tied construction type. An alternative longitudinal joint Type 7 may be used with slip-form paving operations. The location of longitudinal joints shall be centered between pavement lanes and coincide with lane markings wherever possible, except for street widths of 30 feet and wider where joints shall be located at equal intermediate locations. In these cases, longitudinal joints may be sawed and shall be Type 5

10.5 INTEGRAL CURB JOINTS

In the construction of transverse joints, special care must be taken to ensure that all transverse joints extend continuously through the pavement and curb.

ITEM 11.0 TIE BARS

All tie bar reinforcement for concrete pavement shall conform to Item 2.6 of these regulations. All tie bars shall be deformed bars for Types 4, 5, 6 and 7, and plain or smooth bars for Type 1 and 3, as detailed in Appendix "C".

Pavement joint sealer shall be as specified in Item 2.7.2 of these regulations. Application of joint sealer shall be as follows:

Material must be melted in a double boiler, oil jacketed melter equipped with

a mechanical agitator, pump, gas pressure gauges, and separate temperature thermometers for both oil bath and melting vat, with accessible control valves and gauges.

On start up of melter, raise the oil bath temperature, not to exceed 450 degrees (F). Add small quantities of crack filler material to the melter and, while continuously agitating, add additional material as needed. Control material temperature at 380 degrees (F). Do not exceed 400 degrees (F) at start up.

The sealing and filling of joints and/or cracks may be done at air temperature of 40 degrees (F) or higher. For best results, cracks should be filled to a depth of 1/4 inch below the surface. Where necessary to limit the depth of the sealant, use cotton or kraft rope inserted to the correct depth of the cleaned joint or crack.

Small quantities of unused material remaining in the melter may be remelted and used the following day.

ITEM 13.0 STRUCTURES ENCOUNTERED IN THE PAVED AREA

13.1 MANHOLES AND CATCH BASINS: All manholes and catch basins encountered in the areas to be paved shall be raised or lowered to the surface of the new pavement. Catch basins may be separated from the pavement and curb by boxing out around basin. See appendix "C".

ITEM 14.0 PROTECTION AND OPENING TO TRAFFIC

Traffic shall be excluded from the pavement by erecting and maintaining barricades and signs until the concrete is at least fourteen (14) days old or has attained a compressive strength of 3,500 pounds per square inch and/or 550 pounds per square inch flexural strength. This traffic restriction shall apply to the contractor's construction equipment and vehicles, as well as general traffic. As soon as curing and sealing are completed, the contractor shall clean up the pavement free from all debris.

ITEM 15.0 CURB, GUTTER, SIDEWALK, AND DRIVEWAYS

Construction of curb, gutter, sidewalk, and driveways shall require the same care as the street pavement. The preceding requirements shall apply, where pertinent, to the construction of curb, gutter, sidewalks, and driveways within the right-of-way. In addition, sidewalks or driveways shall be constructed so that the transverse joint spacing shall be equal to the width of the sidewalk or driveway, but in no case shall the transverse joint spacing for driveways exceed twelve (12) feet and not greater than five (5) feet for sidewalk spacing. Sidewalk and driveways, within the right-of-way, shall be constructed with a pavement thickness of at least four (4) inches (see Appendix "C" for typical section details). Commercial and industrial entrances will require sidewalk thickness conforming to driveway pavement thickness.

ITEM 16.0 PAVEMENT THICKNESS

Pavement thickness for each type street classification shall be as provided in Table A-1. Streets that are subjected to exceptionally heavy truck traffic shall require a more complete detailed analysis by the subdivider's engineer

and approved by the planning commission.

All arterial streets shall be designed in accordance with the requirements of the Kentucky Department of Transportation.

16.1 TOLERANCE IN PAVEMENT THICKNESS: Deficiency in pavement thickness determined by drilling or coring new concrete pavements shall not exceed 0.20 inches. When thickness of pavement is deficient by more than 0.20 inches, such areas shall be removed and/or replaced unless otherwise determined by the inspector and a qualified registered professional engineer.

TABLE A-1
MINIMUM PAVEMENT THICKNESS FOR
STREETS - PORTLAND CEMENT CONCRETE*

STREET CLASSIFICATION	PAVEMENT THICKNESS INCHES
LOCAL STREETS INCLUDING COURTS AND CUL-DE-SACS (serving 50 lots or less)	7
SUBCOLLECTOR OR LOCAL STREETS (serving more than 50 lots)	8
COLLECTOR	9

** Streets shall be designed in accord with the typical street section details in Appendix "C".

** Where streets are to serve industrial or commercial areas, the pavement design shall be based on a study prepared by the subdivider's engineer projecting the type of vehicles using the street and

traffic volumes approved by the planning commission.

Note: Welded wire fabric or wire mesh for reinforcing concrete pavements shall not be required unless otherwise specified by the design engineer.

APPENDIX "B"

ASPHALT CONCRETE PAVEMENT FOR STREET AND DRIVEWAY CONSTRUCTION

The work covered by these specifications consists of furnishing all labor, equipment and materials, and performing all operations in connection with the construction of asphalt concrete pavement, in accord with these specifications and the applicable improvement drawings.

The asphaltic concrete pavement work shall consist of multiple layers of asphaltic concrete with or without granular base and subbase courses, constructed on a prepared subgrade in conformity with the lines, grades, and cross sections shown on the plans.

The data included herewith is based upon general soil conditions which exist in the area. These general soil conditions, representing approximately 75 percent of the soils in the area, are clayey overburden soils, described as lean to moderately plastic silty clays, classified according to the Unified Soil Classification System as CL soils. Any site which is made up of soils substantially different should be evaluated independently by a qualified Geotechnical Engineer. This work should consist of drilling, testing, and an engineering evaluation of all field and laboratory data, in light of the proposed design.

ITEM 1.0 GRADING

This term shall consist of all grading above or below subgrade elevations of

whatever nature required to bring the street to proper subgrade elevations, including necessary excavation for curb, gutter, sidewalk, construction of embankments, excavation and proper sloping of all cuts, and other work incidental thereto.

1.1 EXCAVATIONS: All excavations shall be made to approximate grade or subgrade elevations consistent with approved plans. Excavations shall not be steeper than a cut slope of 2.5 horizontal to 1 vertical.

1.2 EXCAVATION BELOW SUBGRADE: Whenever excavations below subgrade elevation to remove spongy or unstable material, organic matter, or other materials is required, the contractor shall remove same and shall replace with compactible soils as per Item 1.3. The excavation can be backfilled with soils that were removed, provided they are clean clayey soils free of organic matter and other deleterious material, aerated, and dried to near optimum moisture content or clean clayey borrow soils that have moisture contents near optimum moisture content.

1.3 CONSTRUCTION OF EMBANKMENT: All surface vegetation and heavy root system shall be removed to eliminate all vegetation from the area upon which the embankment is to be constructed. Soils so removed shall not be used in construction of embankment. These materials shall be stockpiled and respread across scarified areas after the scarified areas have been brought to within inches of finished grade.

Embankments shall be constructed of approved soils to approximate subgrade elevation in shallow level layers, 6 to 8 inches, within two (2)

percent of optimum moisture content on the dry side of the curve or within three (3) percent of optimum moisture content on the wet side of the curve, compacted with an appropriate type of compaction equipment to a density not less than 95 percent of maximum density, as determined by the standard Proctor moisture-density test (ASTM D698-78 or AASHO T-99) or 87 percent of maximum density as determined by the modified Proctor moisture-density test (ASTM D1557-58-78 or AASHO T-180). All soils placed in areas involving public improvements shall be constructed to slopes no steeper than 2.5 horizontal to 1 vertical and flatter where possible for ease of maintenance.

1.4 BACKFILL: Clayey soils or granular soils, used to backfill utility excavations for storm, sanitary sewer and water system crossing beneath the pavement and within three (3) feet on either side of the pavement, shall be compacted to the densities stated in Item 1.3. Under no conditions shall granular backfill be flushed with water to obtain compaction.

1.5 SUBGRADE: The subgrade is defined as the top one (1) foot of the soil profile at finished grade prior to placing the pavement. This top one (1) foot of soil will consist of: a) compacted fill placed for embankments and as outlined in Item 1.3; b) undisturbed soils in transitional areas from cut to fill immediately below the topsoil; or c) undisturbed soils at depths greater than 3 feet below the original ground surface in cut areas. The top one (1) foot of subgrade shall be compacted to 98 percent of maximum density as determined by the standard Proctor moisture-density test (ASTM D687-78 or AASHO T-99) or 89 percent of maximum

density as determined by the modified Proctor moisture-density test (ASTM D1557-78 or AASHO T-180) within two (2) percent of optimum moisture content on the dry side of the curve or three (3) percent of optimum moisture content on the wet side of the curve immediately prior to placing the pavement. This specification is similar to the compaction requirement in compacted fill areas since the embankment shall be compacted to 95 percent or 87 percent of maximum density as determined by the standard Proctor or modified Proctor moisture-density test, respectively. In transitional areas from cut to fill, the soils have been subject to seasonal changes of freezing and thawing, and wetting and drying. These soils will exist at moisture contents well above optimum moisture content and at densities on the order of 60 to 80 percent of maximum density (ASTM D698-78). These soils shall be scarified, aerated, and dried, in order to obtain the specified percent compaction for subgrade. Soils in cut areas, 3 feet below original grade, will exist at moisture contents above optimum moisture content and at densities on the order of 90 percent of maximum density (ASTM D698-78). These soils shall be scarified, aerated, and dried in order to obtain the specified percent compaction for subgrade.

Any soft or yielding areas, resulting from high moisture content, that are encountered at the time of construction, shall be scarified, aerated, and dried to reduce the moisture content nearer to optimum moisture content, then recompacted to the specified density.

The subgrade shall be shaped to plan elevation and cross section. Immediately prior to placing the concrete, the subgrade shall be checked

for conformity with the cross section shown on the plans by means of an approved template on the side forms. If necessary, the materials shall be removed or added, as required, to bring all portions of the subgrade to correct elevations. The subgrade shall be thoroughly compacted and again checked with the template. Concrete shall not be placed on any parts of the subgrade which have not been checked for correct elevation. The subgrade shall be clean of loose or wet material prior to placing concrete.

Prior to placing the concrete, the Contractor shall proofroll the compacted subgrade with a piece of equipment, preferably a loaded single axle truck. The Inspector may observe the proofrolling for consistency. Areas which are subject to excessive pumping or rutting shall be reworked and recompacted as described above.

1.6 EQUIPMENT FOR COMPACTION OF BACKFILL, EMBANKMENT, AND SUBGRADE: Any compaction equipment capable of producing the required embankment and subgrade densities, without lamination, will be permitted. Clayey type soils shall be compacted with a kneading type compaction equipment, such as a sheepsfoot roller. Cohesionless soils shall be compacted with vibratory type equipment, such as a vibrating plate or roller. All compaction equipment shall be in good condition and shall be operated efficiently to assure uniform compaction.

1.7 SUBGRADE FOR SIDEWALKS AND DRIVEWAYS: Subgrade for sidewalks and driveways within the limits of right-of-way shall comply with Item 1.3.

1.8 EQUIPMENT OPERATED ON STREETS: The contractor shall be permitted to operate only pneumatic tired equipment over any paved street surfaces and shall be responsible for correcting any damage to street surfaces resulting from the contractor's operation. Paved streets adjacent to new development shall have all loose soil or mud removed at the end of each day's work.

1.9 UTILITIES: Special precautions shall be taken by the contractor to avoid damage to existing overhead and underground utilities. Before proceeding with work, the contractor shall confer with all public or private companies, agencies, or departments that own or operate utilities in the vicinity of the construction work. The contractor shall be diligent in his efforts to use every possible means to locate existing utilities.

1.10 SOIL DENSITY TESTS: Soil density test, including moisture-density tests (ASTM D698-78 or ASTM D1557-78) and field density tests (ASTM D1556-64 or ASTM D2922-78), are required to determine the percent compaction in accord with the following:

(1) Embankments - a minimum of one (1) test for each three (3) feet in elevation per 400 lineal feet or every 2500 cubic yards, or fraction thereof, of embankment section;

(2) Utility backfill excavations for storm, sanitary sewer and water system crossings - a minimum of one (1) test for each two (2) feet in elevation per 100 lineal feet, or fraction thereof, of utility

trench open cut beneath street subgrade and within three (3) feet outside of street pavements;

(3) Subgrades - a minimum of one (1) test per 100 lineal feet for streets 500 lineal feet or less or one (1) test per 200 lineal feet for streets over 500 lineal feet at each of the following locations, where applicable:

(a) compacted fill placed for embankments;

(b) undisturbed soils in transitional areas from cut to fill immediately below the topsoil; and

(c) undisturbed soils at depths greater than 3 feet below the original ground in cut areas.

Density test of soil embankment, utility excavations, or subgrade are not applicable when at least one of the following conditions exist:

(1) more than 5 percent of the material contains greater than one (1) inch sieve size particles; or

(2) more than 60 percent of the material contains greater than No. 4 sieve size particles except DGA (dense graded aggregate).

Proof of conditions (1) or (2) shall be performed by at least one (1) graduation test by a recognized testing laboratory and mailed directly

to the inspector.

All soil density testing shall be at the expense of the developer. The results of these tests shall be mailed directly to the developer, design engineer, inspector, and the contractor. The results of all soil testing shall be compared to the densities, stated in Items 1.3, 1.4, 1.5, and 1.7 of these regulations. Any deficiencies found in construction work must be remedied in the field or resolved between the developer, contractor, and inspector, subject to approval by a qualified registered professional engineer.

ITEM 2.0 PREPARATION OF EXISTING GRANULAR BASE COURSES FOR SURFACING

2.1 DESCRIPTION AND GENERAL REQUIREMENTS: In areas where granular base course has been placed as a previous stage of street or road construction, the contractor shall blade, shape, and compact the base course in conformance with the required dimensions, line, grade, and cross section to permit completion of the paving work. When directed by the Inspector, additional base course aggregates shall be provided or excess aggregate removed and disposed of, by the Contractor, as to provide conformance with the required roadway section.

2.2 THICKNESS OF SURFACING REQUIRED FOR EXISTING GRANULAR BASE COURSES: The existing thickness of granular base comprises a portion of the required Design Thickness as specified in Item 4.2 Appendix "B" of these regulations.

ITEM 3.0 ASPHALT PAVEMENT

3.1 DESCRIPTION AND GENERAL REQUIREMENTS: This item shall consist of furnishing all materials and performing all construction procedures required to build an asphalt pavement, on a prepared and approved subgrade, conforming to the requirements of these specifications and to the pavement design shown on the approved plans. It may include any, or all, but is not necessarily limited to, materials and methods specified under Item 3 only.

Asphalt pavement shall consist of an asphalt concrete surface course, or courses, constructed on a base course, or courses and/or subbase course, designed in compliance with the requirements of Item 4.2 of Appendix "B" of these regulations.

Successive layers of the pavement shall be offset from the edge of the underlying layer, a distance equal to the course thickness of the lower layer, except when abutting existing construction. When the asphalt layers of the pavement abut a building foundation, barrier curb, or similar vertical surface, the abutting surface shall be heavily painted with asphalt prior to construction of the asphalt course. The surface course shall be finished one-fourth (1/4) inch above adjacent flush construction to permit proper compaction.

3.2.1 ASPHALT CONCRETE SURFACE COURSE: Asphalt Concrete Surface Course materials and construction shall conform to the current requirements of the Kentucky Department of Transporta-

tion, Bureau of Highways, for Asphalt Concrete Surface and Binder (Section 401, 402). Surface course mixture composition shall conform to the requirements Surface and Binder as set forth in Table B-1. Minimum Asphalt Concrete Surface, Binder, and Base Courses Thickness shall be as stated in Table B-2 of these regulations.

3.2.2 ASPHALT CONCRETE BASE COURSE: Asphalt Concrete Base Course materials and construction shall conform to the current requirements of the Kentucky Department of Transportation, Bureau of Highways, Specifications for Asphalt Concrete Base Course (Section 401, 403).

Composition requirements of the mixture shall conform to the gradation limits for Asphalt content used shall fall within the range shown and shall be approved by the inspector.

3.2.3 CRUSHED AGGREGATE BASE COURSE:

3.2.3.1 DESCRIPTION: Crushed Aggregate Base Course, Then provided for in the approved structural design of the pavement, shall consist of a granular layer constructed on prepared subgrade or subbase in accord with these specifications and in conformity with the approved dimensions, lines, grades, and cross sections.

3.2.3.2 MATERIALS AND CONSTRUCTION METHODS: Crushed Aggregate Base Course shall conform to all the current requirements for materials and construction methods of the Kentucky Department of Transportation for Dense Graded Aggregate Base Course as per Section 303.

3.2.4 GRANULAR SUBBASE COURSE:

3.2.4.1 DESCRIPTION: Subbase, when provided for in the approved structural design of the pavement, shall consist of a granular layer conforming to the following material and construction specifications.

3.2.4.2 MATERIALS AND CONSTRUCTION METHODS: Crushed Aggregate Subbase Course shall conform to all the current requirements for materials and construction methods of the Kentucky Department of Transportation for Dense Graded Aggregate Subbase Course as per Section 303.

3.2.5 ASPHALT PRIME COAT: Asphalt Prime Coat shall be applied to the surface of granular courses upon which asphalt base or surface courses will be constructed. Asphalt Prime shall conform to the Kentucky Department of Transportation requirements for Cutback Asphalt Emulsion Primer Type L, as

per Section 407. Prime shall be applied to the surface of granular base course at a rate of 0.25 to 0.50 gallons per square yard, as directed by the inspector, in conformance with requirements of the referred to specification.

3.2.6 ASPHALT TACK COAT: Tack Coat shall consist of SS-1h, meeting the current requirements of the Kentucky Department of Transportation. It shall, when directed by the inspector, be diluted with equal parts of water. Application equipment and procedure shall conform to the requirements of the Kentucky Department of Transportation for Tack Coats as per Section 407. Tack Coat shall be applied to the surface of asphalt courses that have become dusty or dry from traffic use at a rate of 0.10 gallon per square yard of the diluted SS-1h before the subsequent course is constructed or in other circumstances when the inspector so directs.

ITEM 4.0 DESIGN OF ASPHALT PAVEMENT STRUCTURE

4.1 DESCRIPTION: Asphalt pavement structures for subdivision streets shall be designed in conformance with the requirements of this specification. Thickness of the total pavement, and of component layers, shall be determined on the basis of Street Classification.

4.2 PAVEMENT THICKNESS REQUIREMENTS: Thickness of component layers of the pavement for streets within the right-of-way and of the total

pavement structure shall be determined as per Table B-2. Where streets are to serve industrial or commercial areas, the pavement design shall be based on a study prepared by the subdivider's engineer projecting the type of vehicles using said streets and traffic volumes, and approved by the planning commission's duly authorized representative.

ITEM 5.0 ADJUSTING MANHOLE TOPS

5.1 DESCRIPTION: The contractor shall raise or lower existing manhole tops to coincide with the finished grade elevation of the paving.

TABLE B-1
TABLE OF COMPOSITION LIMITS FOR BITUMINOUS CONCRETE

Sieve Size	Percent Passing by Weight		
	Base	Binder	Surface
1 1/2 in.	100		
1 in.	(2)		
3/4 in.	70-98	100	
1/2 in.	---	---	100
3/8 in.	44-76	57-85	80-100
No. 4	30-58	37-68	55-80
No. 8	21-45	25-52	35-60
No. 16	14-35	15-38	22-46
No. 50	5-20	5-20	5-21
No. 100	3-10	3-10	3-14
No. 200	---	---	2-7
Asphalt Content (1)	3.5-6.5	4.0-7.0	4-8

(1) Percent by weight of the total mixture.

(2) When the specified thickness of the Base course is 2 inches or less, either 100 percent of the aggregate shall pass the 1-inch sieve or the Contractor may request in writing to use Bituminous Concrete Binder. When the Contractor elects to use bituminous concrete binder in lieu of bituminous concrete base, all requirements for thickness and compaction (or density) will apply, the same as if bituminous concrete base was used.

ITEM 6.0 JOINT SEALING COMPOUND

The material used for filling and sealing cracks and/or joints between concrete and/or asphalt shall be W.R. Meadows Sealtight #164 Hot Pour Rubber Asphalt Sealer or approved equal.

TABLE B-2
THICKNESS REQUIREMENTS
FOR ASPHALT PAVED STREETS

STREET CLASSIFICATION	PAVEMENT DESIGN				
	TOTAL MINIMUM THICKNESS (Method 1)		TOTAL MINIMUM THICKNESS (Method 2)		
	SURFACE (inch)	BASE (inch)	MIN. SURFACE (inch)	MIN. BASE (inch)	MIN. GRANULAR SUBBASE (inch)
LOCAL (6)	2	2 @ 3"	2	3	6
SUB-COLLECTOR (7)	2	2 @ 3-1/2"	2	4	8
COLLECTOR	2	2 @ 4"	2	5	8

NOTES:

(1) Methods 1 and 2 will produce approximately the same pavement quality and strength.

(2) Selection of the method shall be at the design engineer's option.

(3) Designations pertinent to surface and binder and base courses used in this table correspond to the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction:

Surface and Binder (State Highway Designation Section 401, 402)

Base (State Highway Designation Sections 401, 403) Each layer of bituminous concrete base shall be constructed to a compacted thickness no less than 3 inches nor more than 5 inches, unless otherwise directed by the inspector.

Granular base or granular subbase for Method 2 shall conform to composition limits specified in Sections 3.2.3 and 3.2.4. Each layer of granular base or subbase shall be constructed to a compacted thickness no less than 3 inches nor more than 8 inches, unless otherwise directed by the inspector.

(4) Where streets are to serve industrial or commercial areas, the pavement design shall be based on a study prepared by the sub-divider's engineer projecting the type of vehicles using the

street and traffic volumes approved by the planning commission's duly authorized representative.

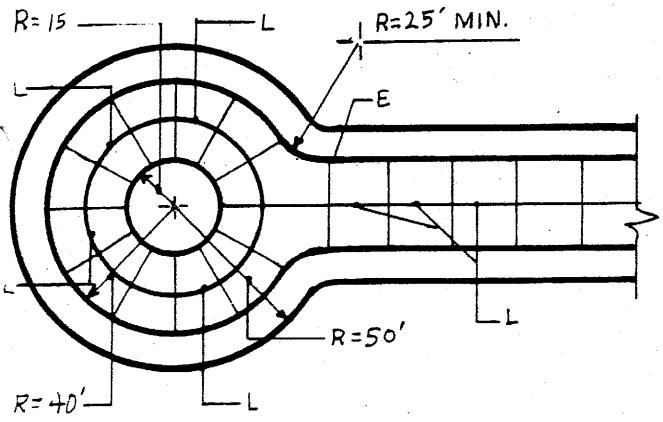
(5) Arterial streets shall be based on requirements of the Kentucky Department of Transportation.

(6) Pavement thickness alternatives (Method 1 or 2) for LOCAL streets include COURTS and CUL-DE-SACS serving 50 lots or less.

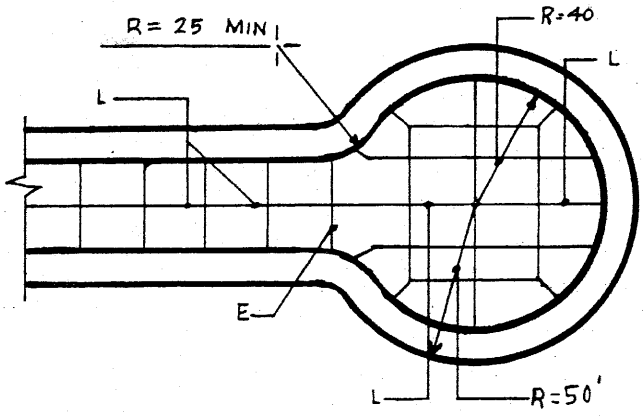
(7) Pavement thickness alternatives (Method 1 or 2) for SUB-COLLECTOR Streets include LOCAL streets serving more than 50 lots.

APPENDIX "C"

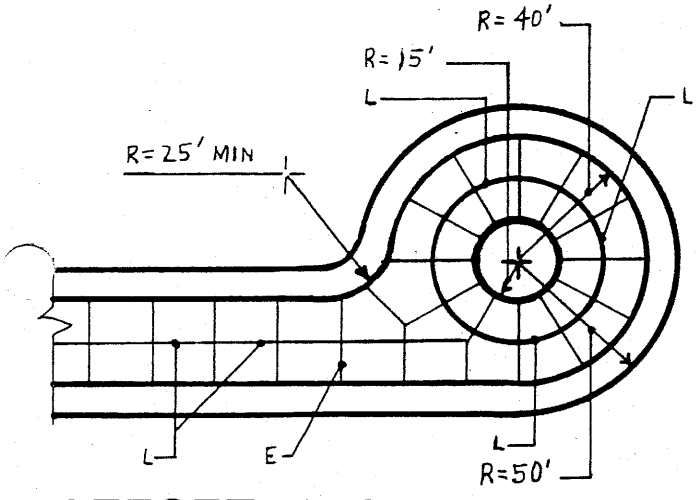
STANDARD CONSTRUCTION REQUIREMENTS AND DETAILS FOR STREETS, SIDEWALKS, DRIVEWAYS, EROSION CONTROL, AND STORM DRAINAGE SYSTEMS



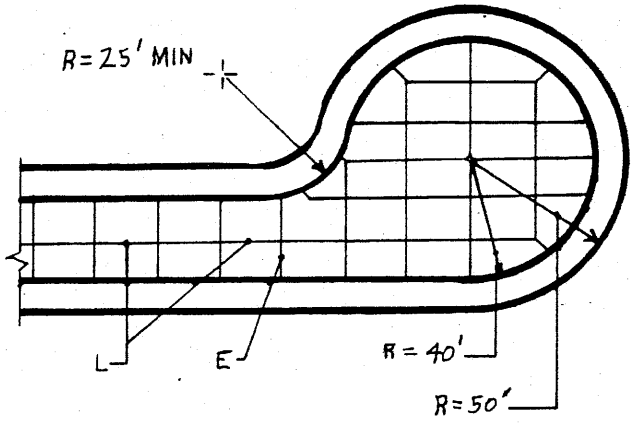
CUL-DE-SAC OPEN CENTER



CUL-DE-SAC FULLY PAVED



OFFSET CUL-DE-SAC OPEN CENTER



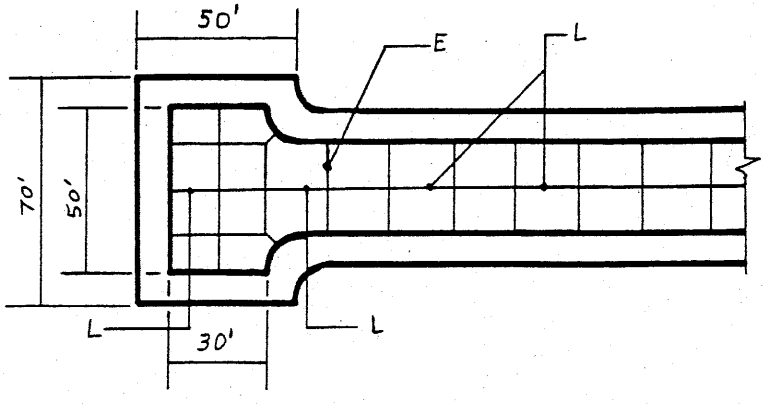
OFFSET CUL-DE-SAC FULLY PAVED

NOTE:

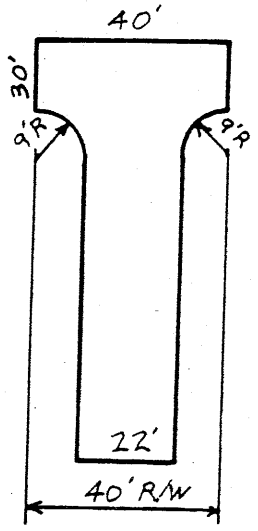
L Longitudinal joint
E Expansion joint
R Radius

All joints shown but not marked are to be contraction joints.

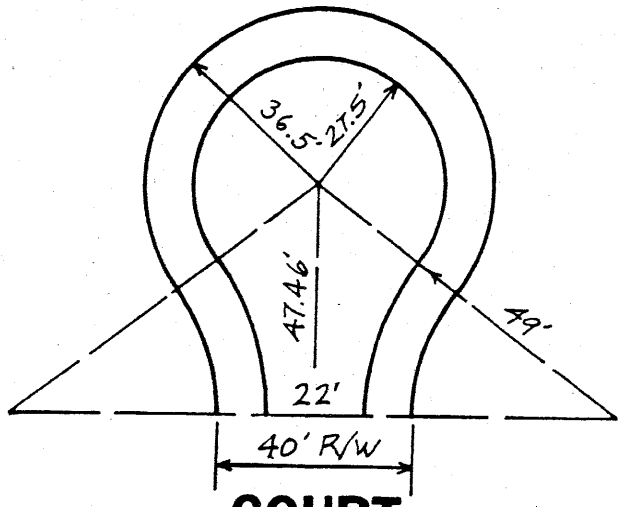
Concrete curb & gutters shall have the same general joint requirements as concrete pavements



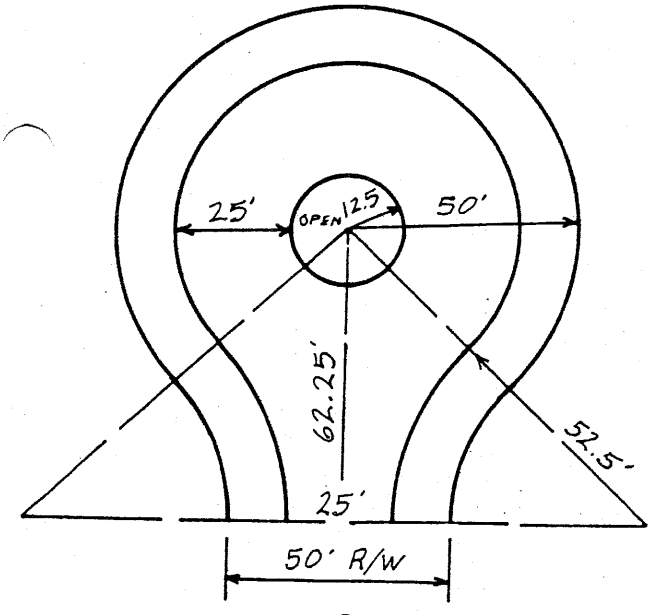
T-TYPE TURN AROUND



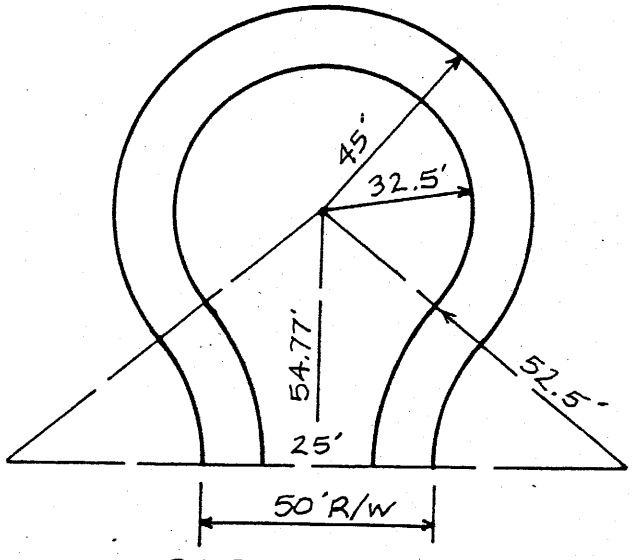
COURT
ALTERNATE T-TYPE



COURT



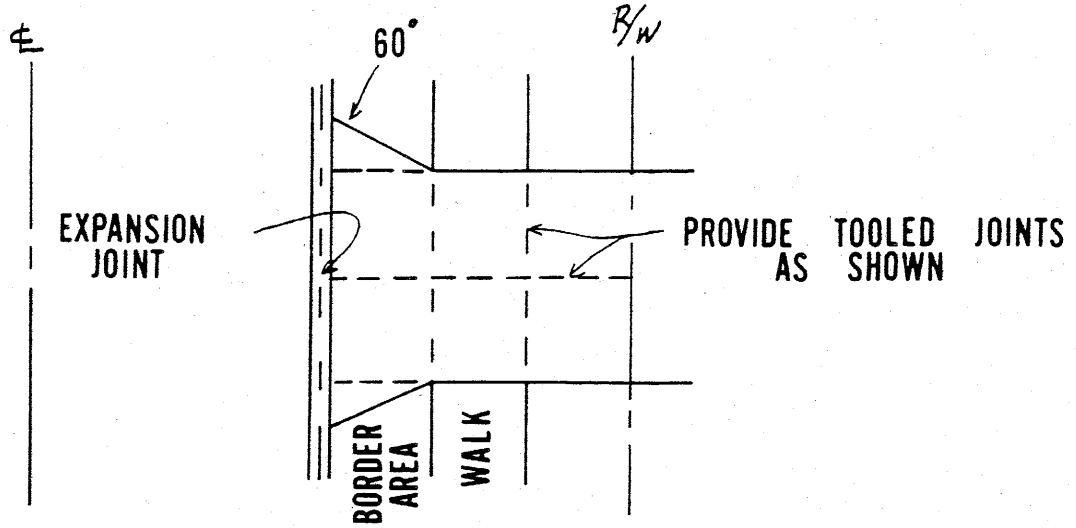
LOCAL



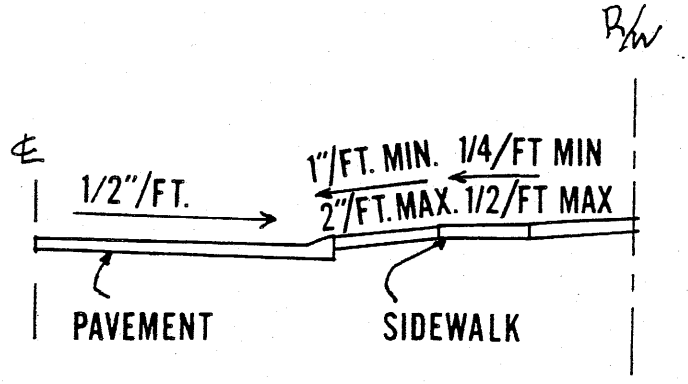
CUL-DE-SAC

TURN AROUND DETAILS FOR DEAD END STREETS

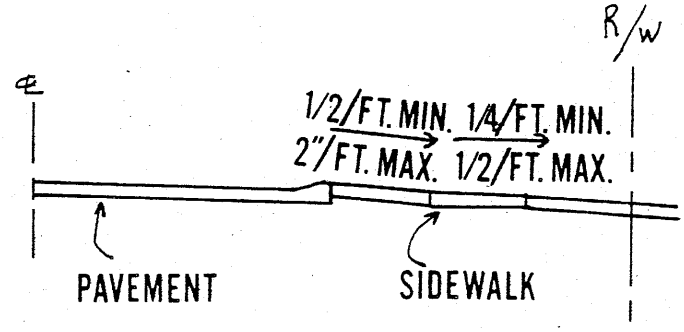
RESIDENTIAL DRIVEWAY APRON DETAILS



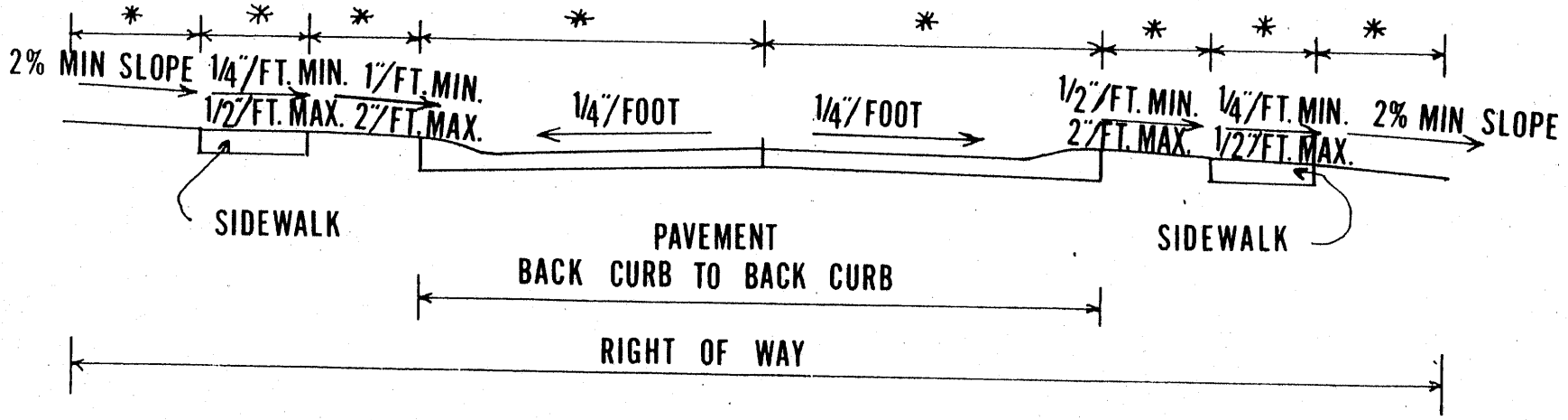
APRON PLAN VIEW



APRON GRADE WHERE LOTS DRAIN TO STREET



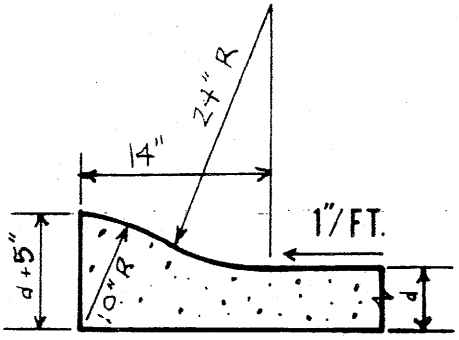
APRON GRADE WHERE LOTS DRAIN FROM STREET



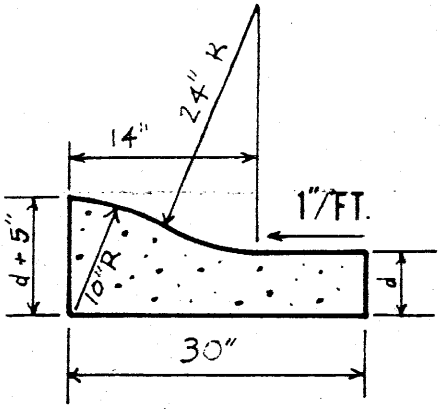
TYPICAL STREET SECTION

* DIMENSIONS VARY DEPENDENT ON THE TYPE OF STREET AND REQUIRED RIGHT OF WAY WIDTH.

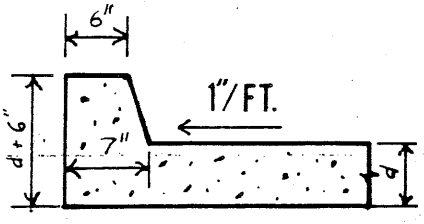
CURB & GUTTER DETAILS



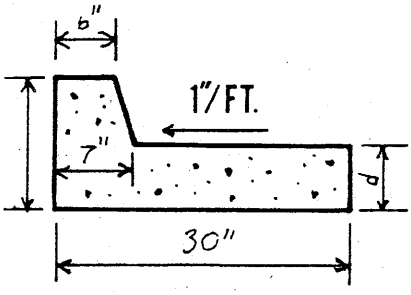
INTEGRAL CURB
CONCRETE PAVEMENT



CONCRETE CURB
ASPHALT PAVEMENT

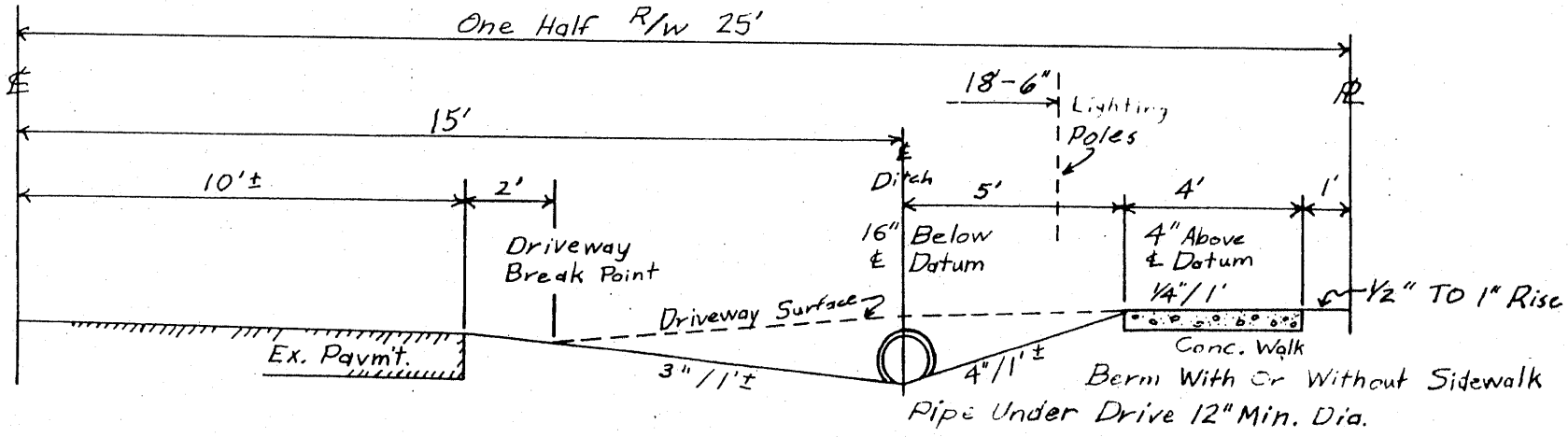


INTEGRAL CURB
CONCRETE PAVEMENT

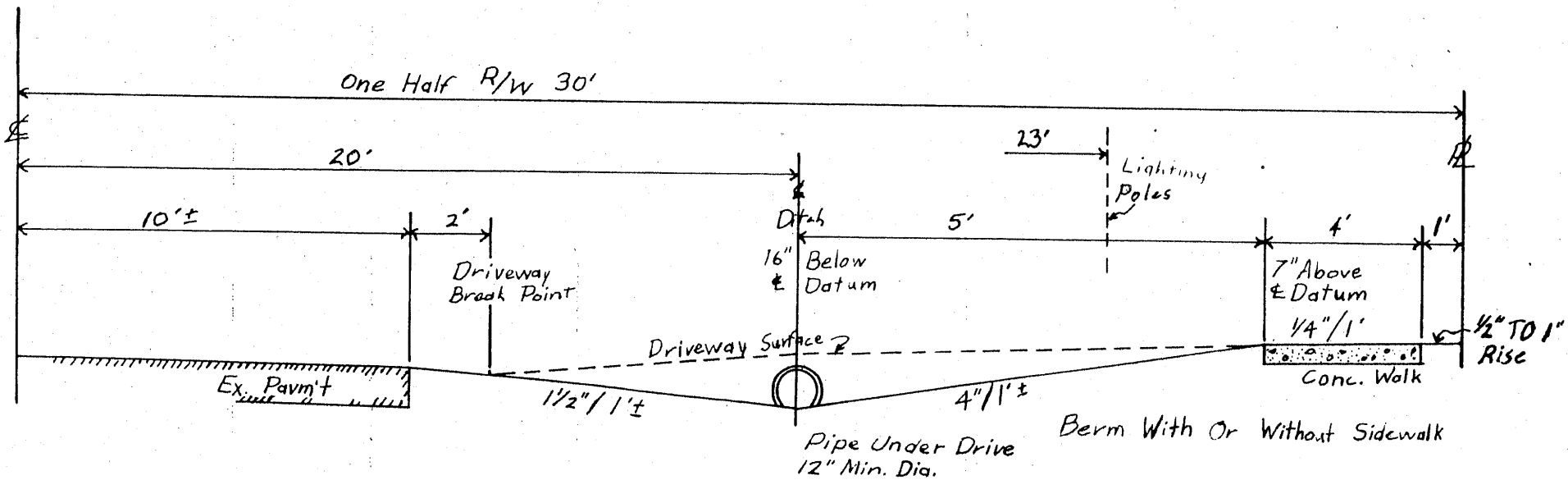


CONCRETE CURB
ASPHALT PAVEMENT

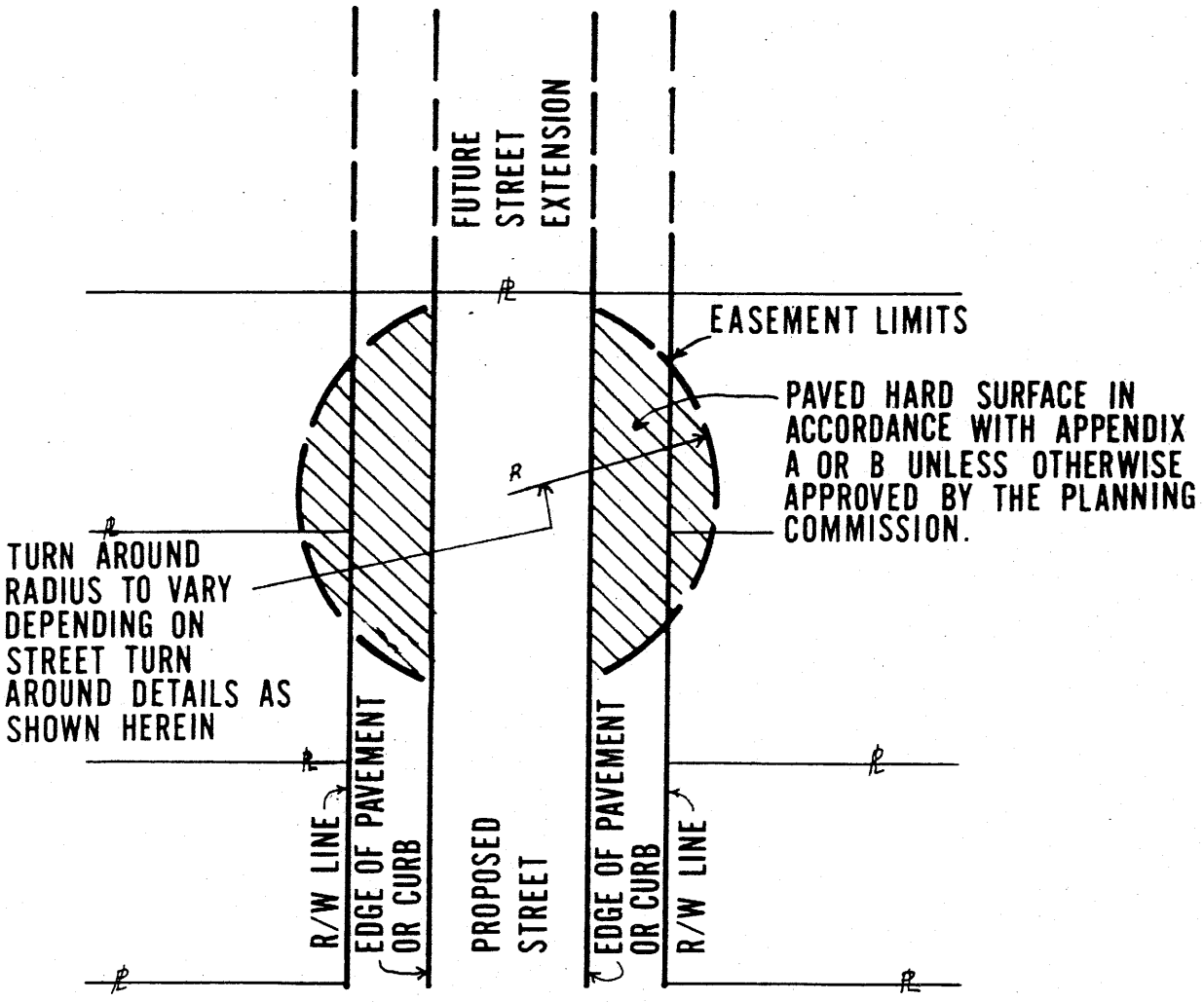
TYPICAL SECTION–SIDE DITCH DRAINAGE AT DRIVEWAY



50 FOOT RIGHT OF WAYS

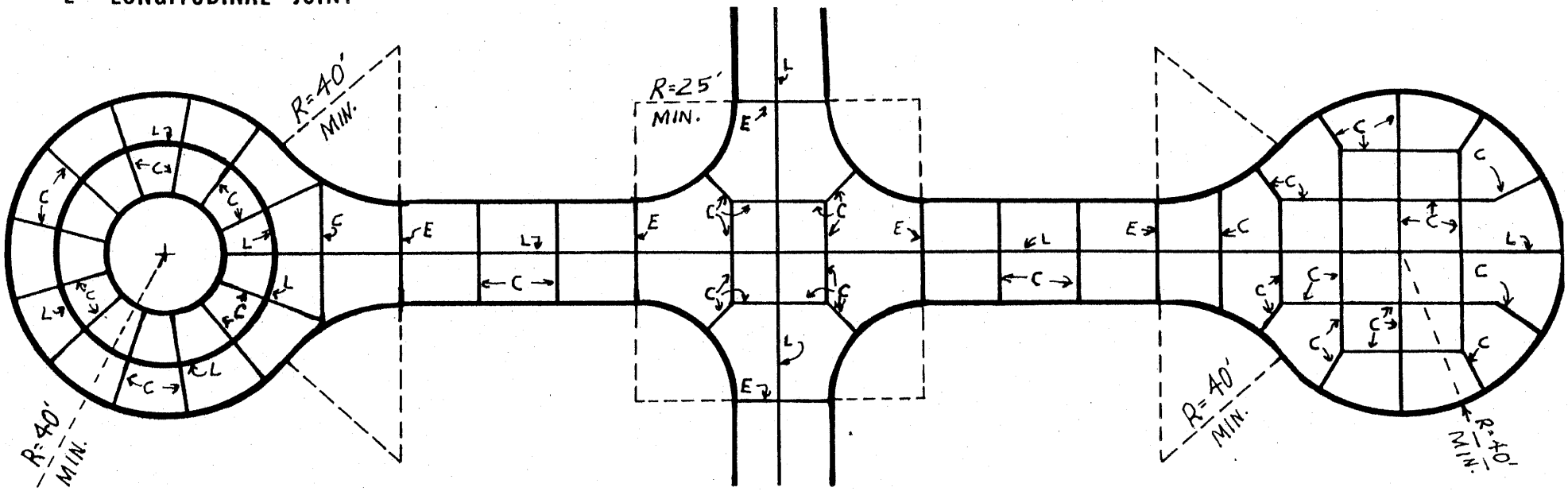


60 FOOT RIGHT OF WAYS



DETAIL OF TEMPORARY TURNAROUND FOR FUTURE STREET EXTENSION

"E" = EXPANSION JOINT
"C" = CONTRACTION JOINT
"L" = LONGITUDINAL JOINT



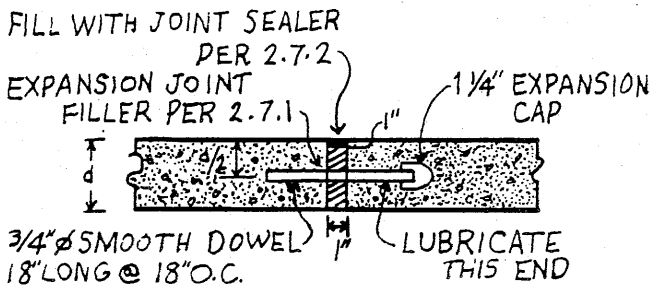
CUL-DE-SAC
OPEN CENTER

INTERSECTION

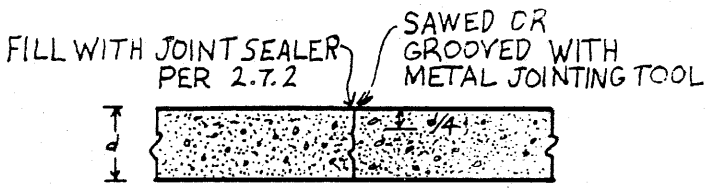
CUL DE-SAC
FULLY PAVED

TYPICAL JOINTING PLAN FOR CONCRETE STREETS

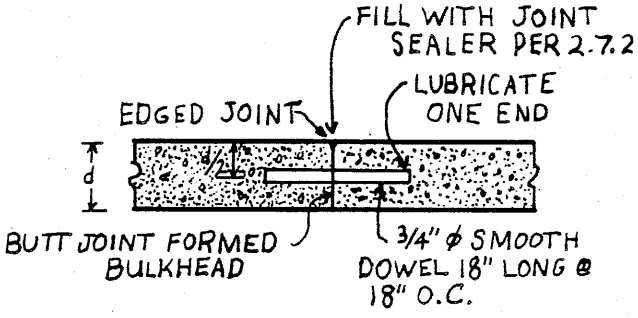
JOINT DETAILS



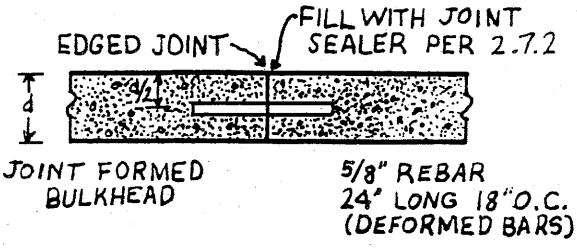
TYPE 1–Expansion Joint



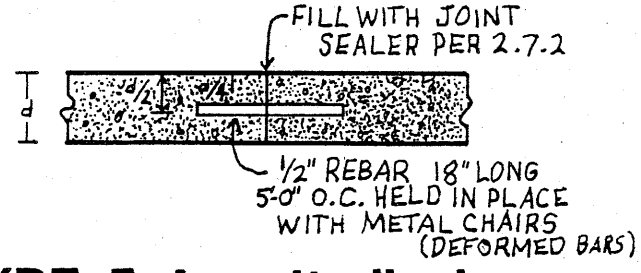
TYPE 2–Transverse Contraction Joint
(sawed or grooved joint)



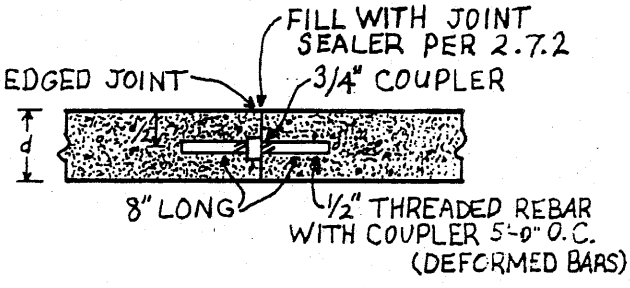
TYPE 3–Transverse Construction Joint



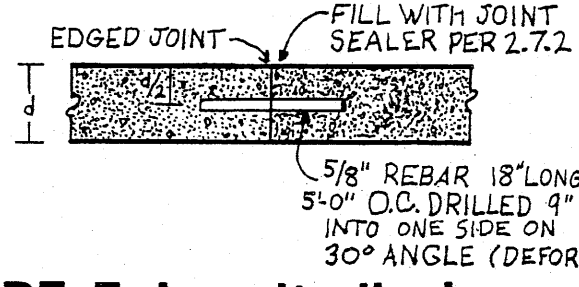
TYPE 4–Transverse Construction Joint
(emergency-not coincide with contraction joint)



TYPE 5–Longitudinal Sawed Joint

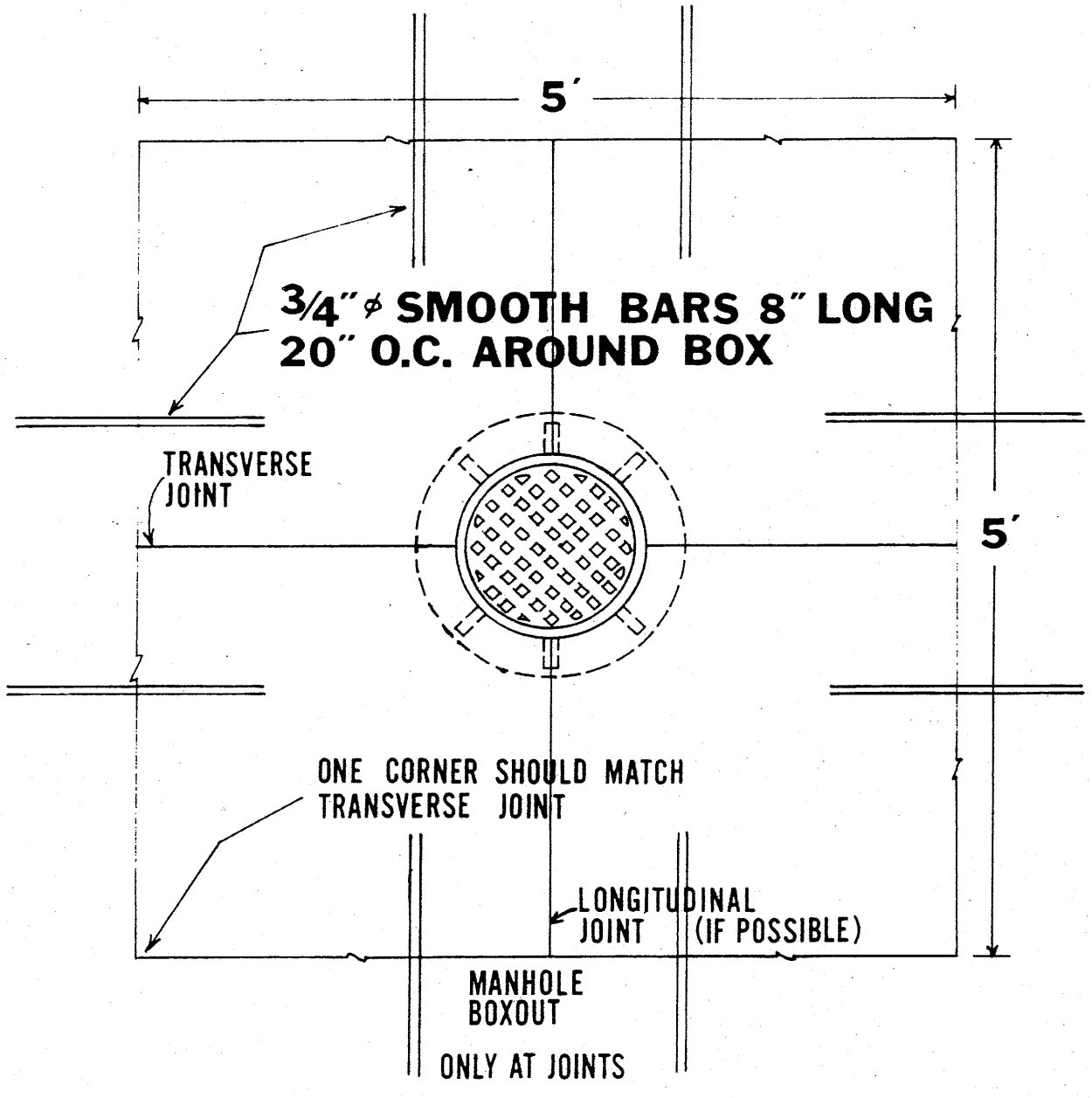


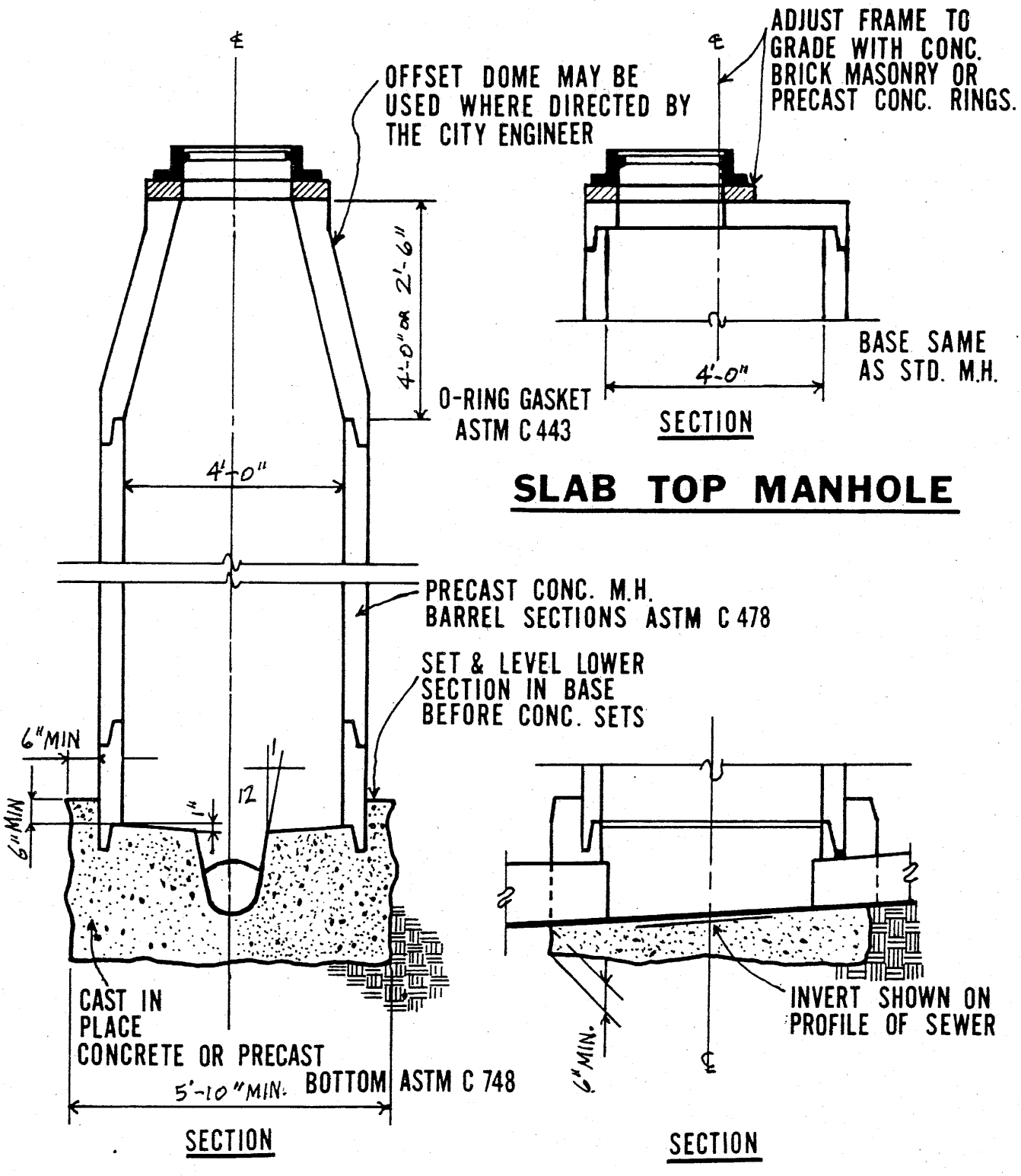
TYPE 6–Longitudinal Construction Joint
(threaded rebar)



TYPE 7–Longitudinal Construction Joint Alt. (drilled)

MANHOLE DETAIL
IN CONCRETE PAVEMENT

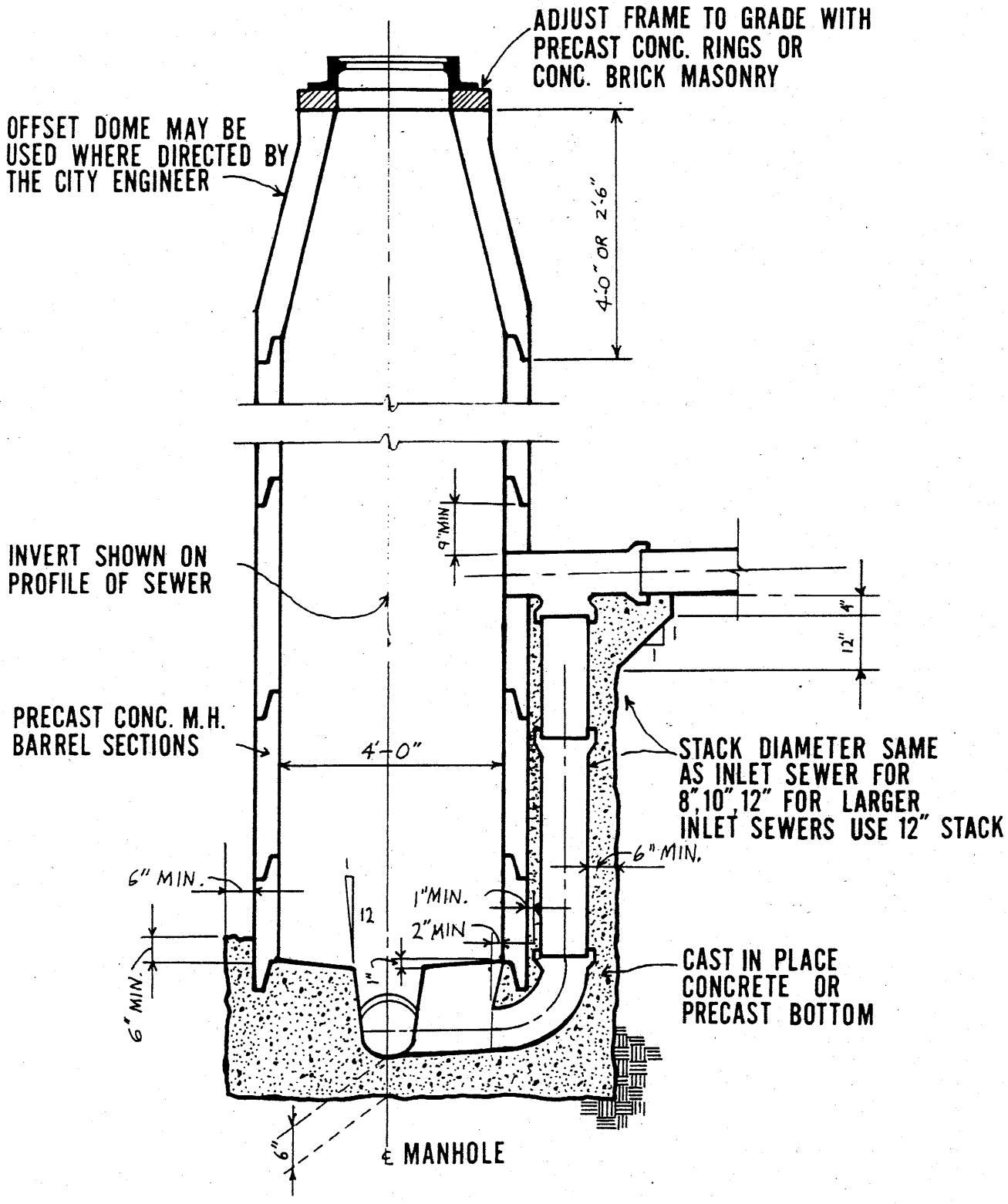




STANDARD MANHOLE

STEPS - PROPYLENE ASTM D 2146

PIPE CONNECTION - FLEXIBLE JOINT: DURA SEAL III (DURA-TECH)
PRESS WEDG II (PRESS SEAL GASKET)
KOR-N-SEAL (NTL. POLL. CONST. SYS.)

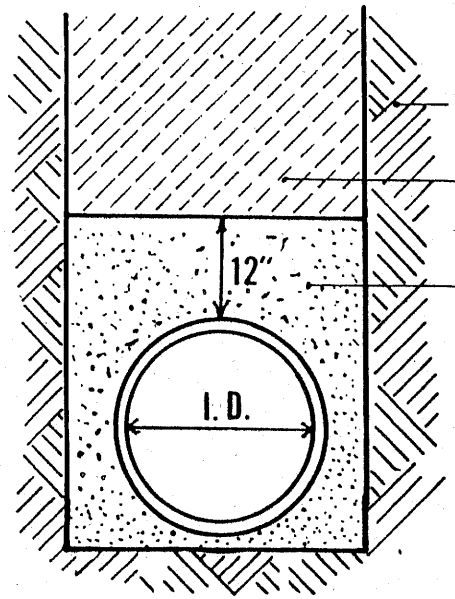


SECTION

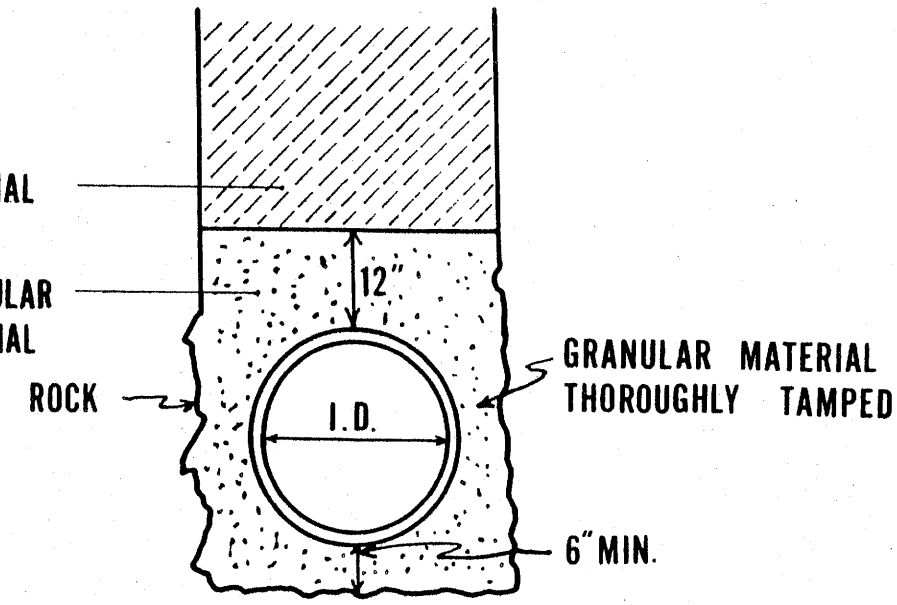
STANDARD DROP MANHOLE

STANDARD PAVEMENT DRAWING

UTILITY TRENCH BACKFILL AND BEDDING



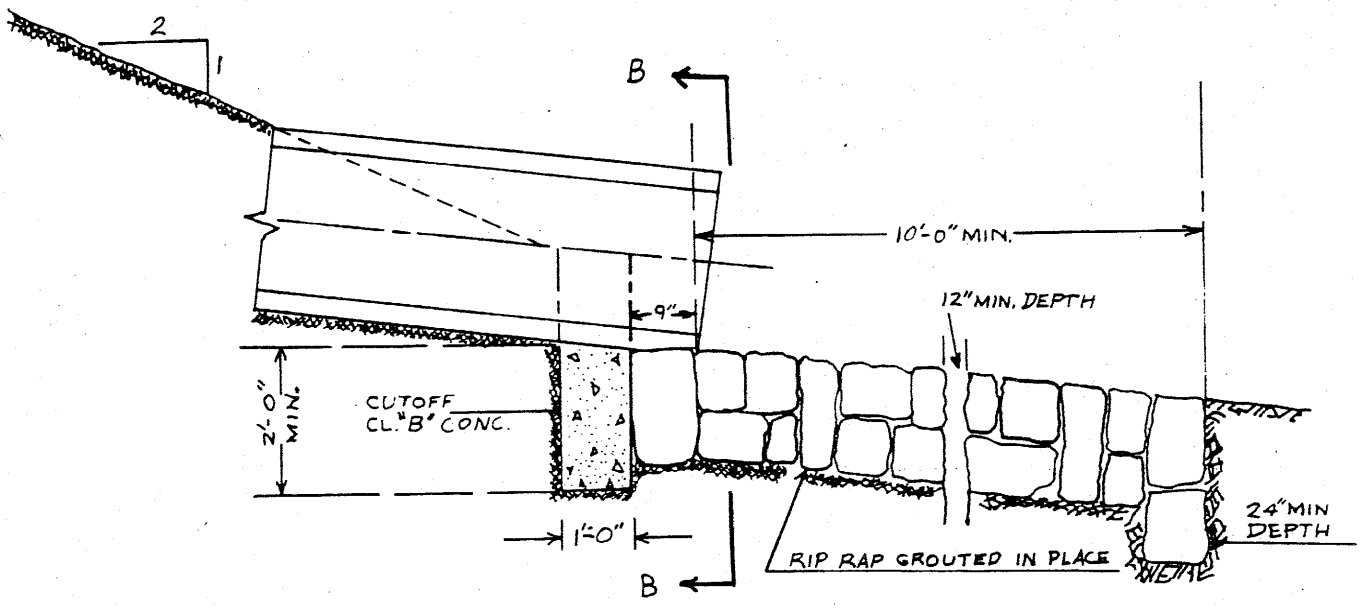
DETAIL CLASS "B" BEDDING



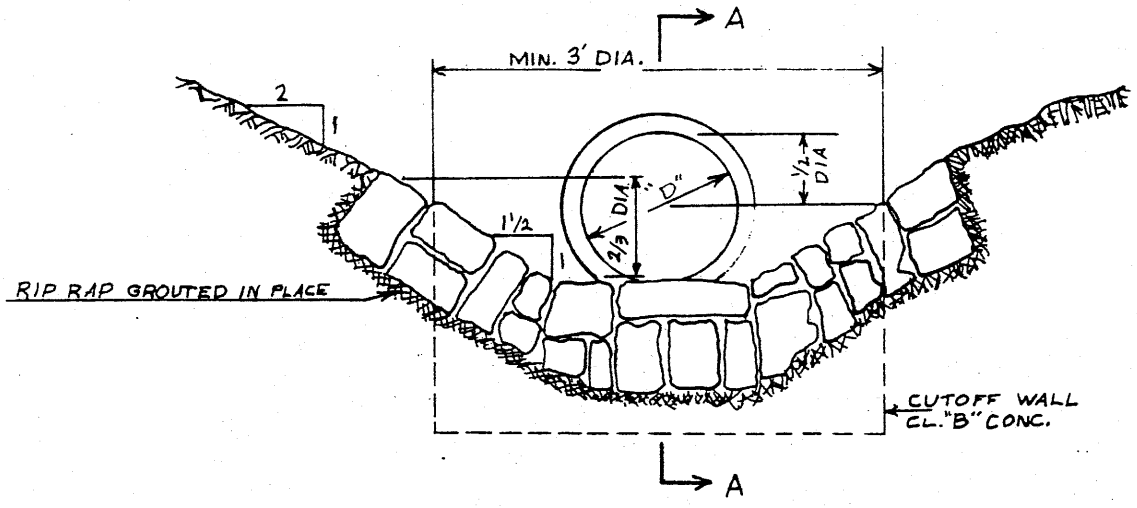
DETAIL BACKFILL & BEDDING

NOTE A:

- FOR CONDUITS BELOW AND WITHIN 5' OF PAVED SURFACES, BACKFILL MATERIAL SHALL BE 100% GRANULAR, COMPACTED TO 95% OF STANDARD PROCTOR MAX. DRY DENSITY.
- FOR CONDUITS WITHIN THE PUBLIC R/W, BUT MORE THAN 5' FROM A PAVED SURFACE, THE BACKFILL ABOVE THE BEDDING MATERIAL MAY BE SUITABLE SOIL OR GRANULATED MATERIAL COMPACTED IN ACCORDANCE WITH THE EMBANKMENT CONSTRUCTION REQUIREMENT CONTAINED HERE IN.
- FOR CONDUITS OUTSIDE OF THE PUBLIC R/W BACKFILL MATERIAL MAY BE SUITABLE SOIL OR GRANULAR MATERIAL PLACED IN 4" LAYERS AND COMPACTED WITH MECHANICAL TAMPERS.



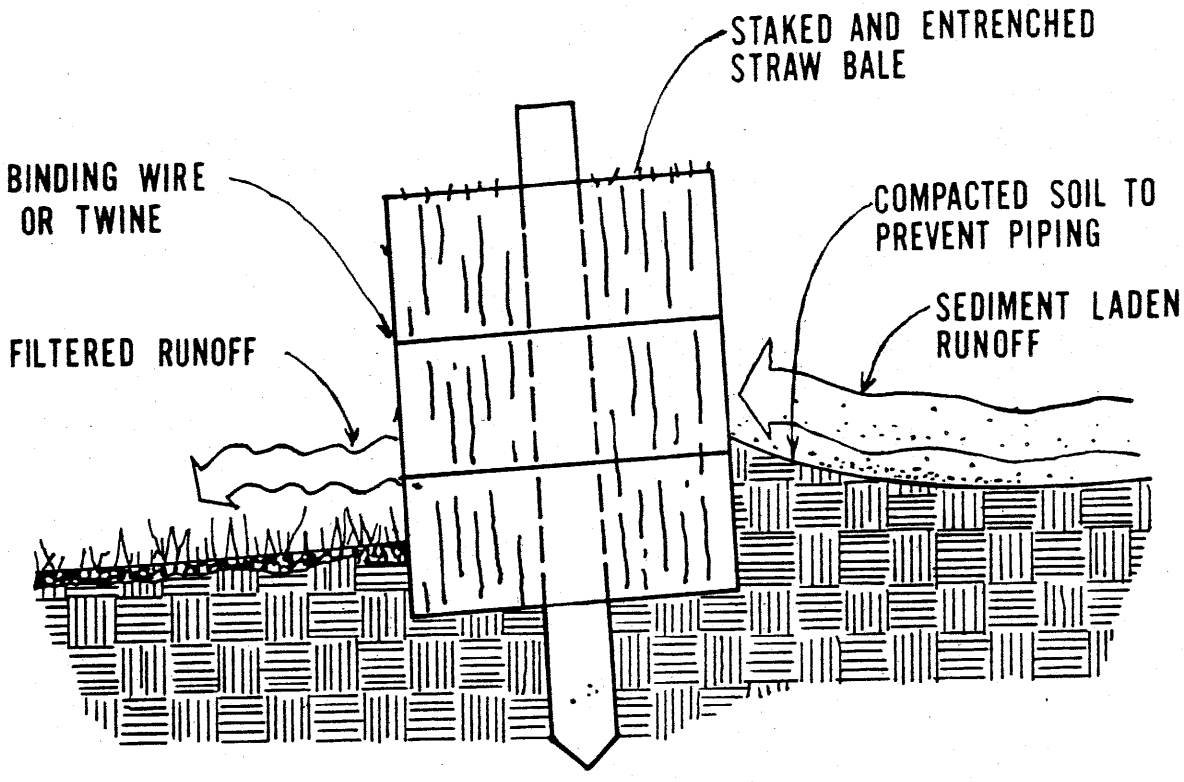
SECTION A-A



SECTION B-B

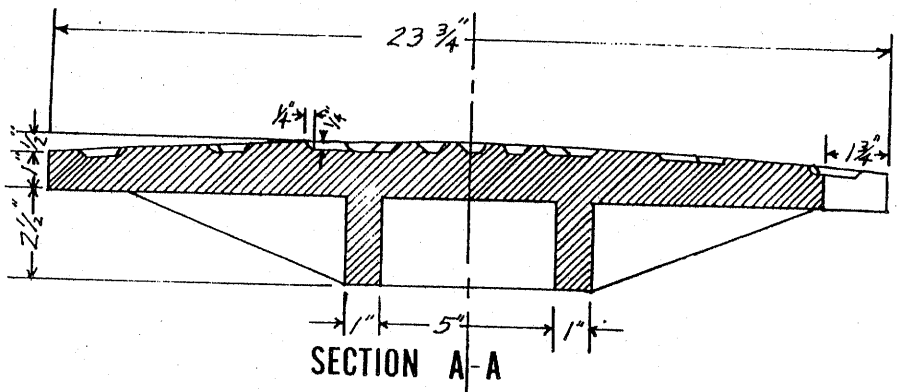
TO BE USED WHERE RIP RAP APRON IS CALLED FOR ON PLANS AND NO DETAIL IS PROVIDED.

RIP RAP APRON & CUTOFF WALL

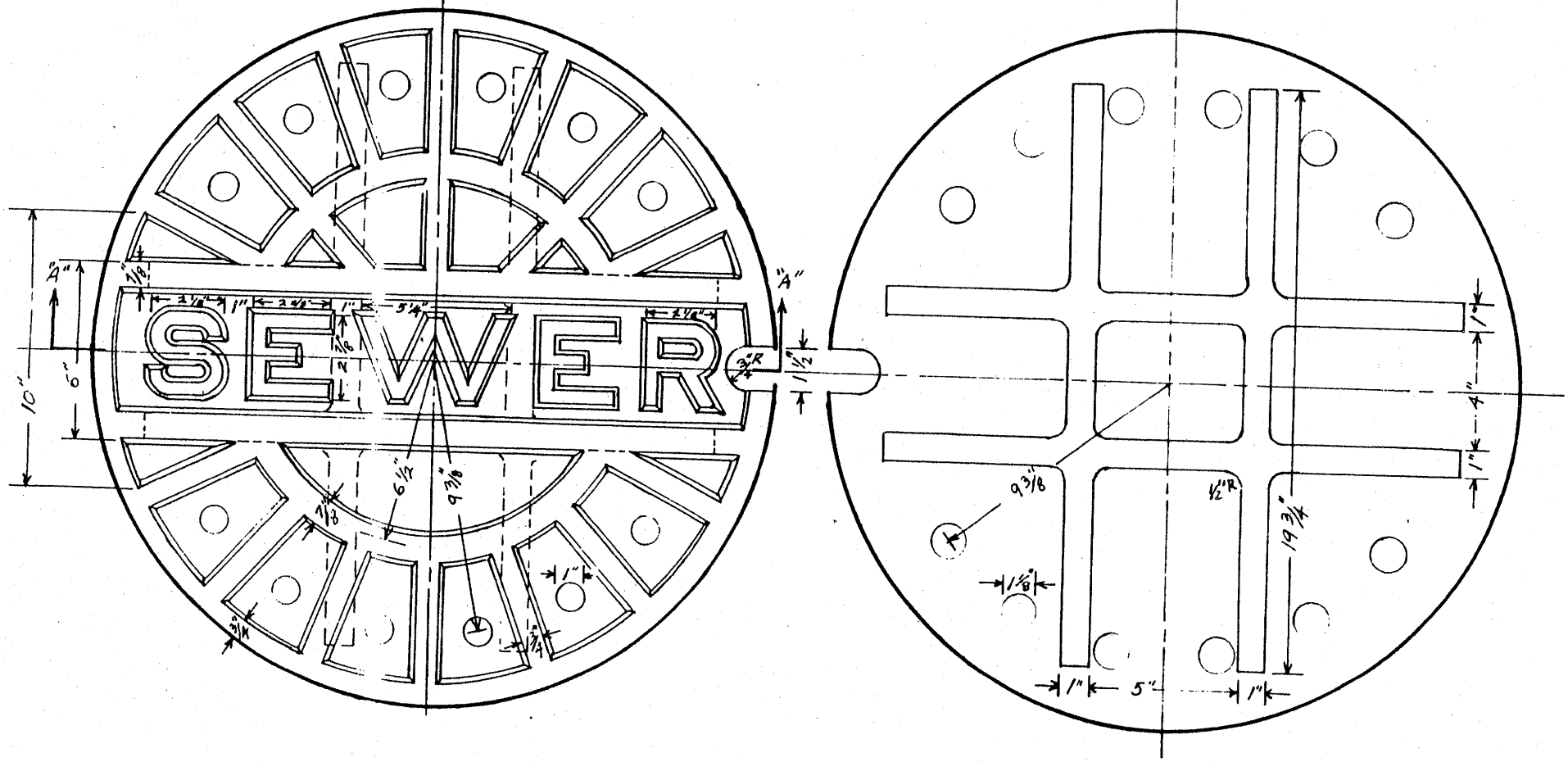


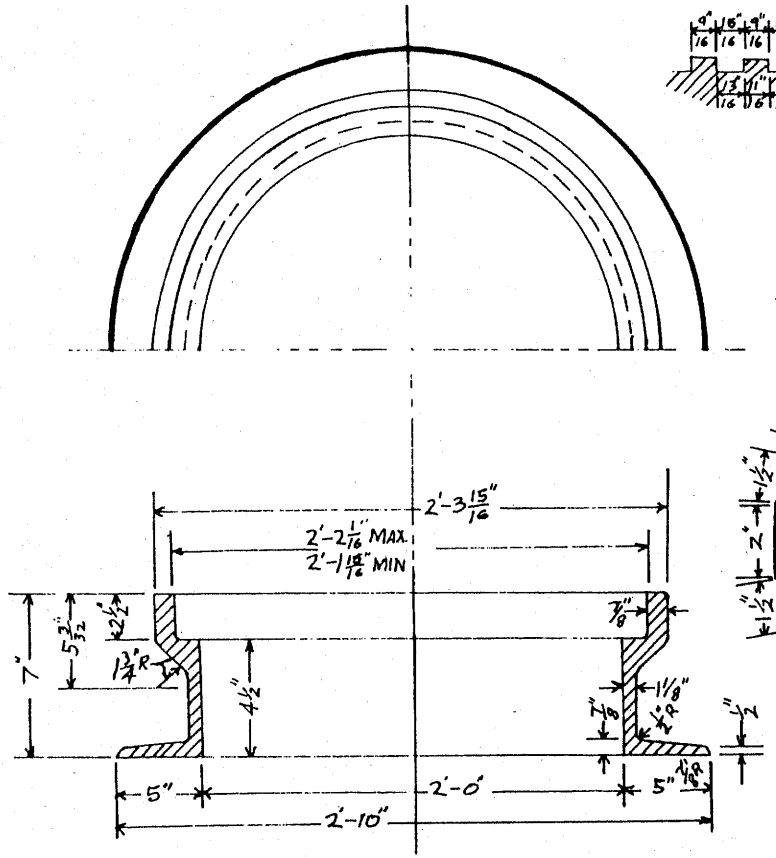
CROSS-SECTION OF A PROPERLY INSTALLED STRAW BALE

DETAILS OF MANHOLE FRAME & COVER FOR STORM SEWERS

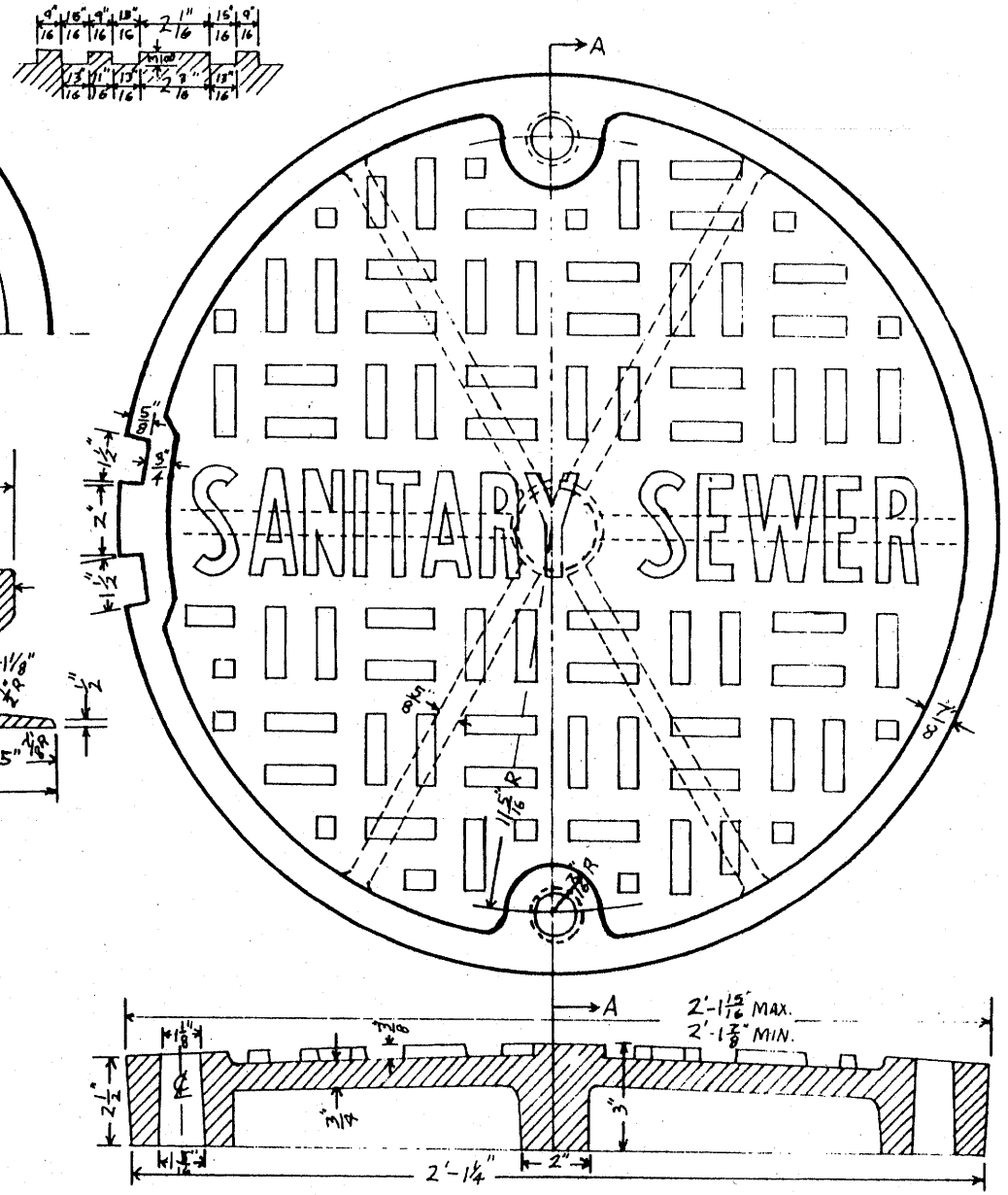


SECTION A-A





MANHOLE FRAME



MANHOLE COVER

DETAILS OF MANHOLE FRAME AND COVER