

**ANN ARBOR CHARTER TOWNSHIP
WASHTENAW COUNTY, MICHIGAN**

**LAND
DEVELOPMENT
STANDARDS**

JULY 17, 2023

PREAMBLE

The promulgation of land development standards is considered to be a significant responsibility of the Ann Arbor Township Board. The Board believes that high uniform standards must be maintained in order to protect the citizens and businesses of the Township and to ensure that future Boards are not burdened with remedial and retroactive solutions. Quality planning and implementation are seen as priority and viable goals.

These standards have been adopted by the Ann Arbor Township Board and periodically revised as listed below.

Adopted July 21, 1997

Amended September 19, 2020

Amended July 17, 2023

by
The Board of Trustees
for
ANN ARBOR CHARTER TOWNSHIP

This compilation of the Land Development Standards is printed by the authority of Ann Arbor Charter Township Board of Trustees and contains those standards printed herein, compiled with all amendments up to July 17, 2023.

Rena Basch, Clerk

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CHAPTER 1

PURPOSE OF STANDARDS

1.01 These standards are intended to:

- a) Provide a reasonable and proper basis for the design and construction of land improvements such as sanitary sewer and water facilities, drainage facilities, and grading.
- b) Preserve and enhance the Township's character, the safety and well-being of its residents, its economic well-being, and its quality of life.
- c) Preserve natural features to the maximum extent possible.
- d) Establish uniformity in Township requirements.
- e) Describe the required information prior to submittal of plans so that the plans will be complete and in proper form when submitted, thereby reducing the Township's and developer's time and expense in the review process.
- f) Enable designers and developers to estimate the costs of Township requirements as early in the development process as possible.
- g) Provide accurate on-site and off-site information for each project that will become permanent public records of the Township.

1.02 These standards apply to all land improvements involved in site plans including site condominiums and area plans, as required in the Ann Arbor Charter Township Zoning Ordinance, and subdivision plats, as required in the Township's Subdivision Control Ordinance. In addition, all site plans shall be required to be in compliance with all applicable laws, rules, and regulations of each applicable jurisdiction.

1.03 These standards are the minimum requirements necessary to promote the public health, safety, and welfare of the people of Ann Arbor Charter Township. These standards are not intended to interfere in any manner with the application or enforcement of the laws, ordinances and regulations of Ann Arbor Charter Township, Washtenaw County, the State of Michigan, or the United States.

1.04 The headings of the chapters and sections within chapters are inserted for reference only and shall not affect in any way the meaning and interpretation of these standards.

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CHAPTER 2
WATER MAINS

- 2.01** All water mains shall be shown in plan and profile on standard 24-inch by 36-inch white prints having blue or black lines, and shall be neatly and accurately prepared to an engineering scale and contain, at a minimum, the following information:
- a)** Water main location and material type.
 - b)** Water main size (minimum 8-inch for public water mains).
 - c)** Cover (generally 5.5-feet).
 - d)** Bedding (2NS sand minimum).
 - e)** Compaction of trenches in roadway corridors and within the influence of all paving (Class II granular backfill at 95% compaction). Roadway corridors constitute front of house to front of house in residential developments.
 - f)** Hydrant and post indicator valve locations. (Shown graphically in plan and profile). Post indicator valves shall be placed a minimum of 1.5 times the height away from the building.
 - g)** Gate well and curb box locations. (Shown graphically in profile).
 - h)** A consecutive numbering system for all hydrants and gate wells with a structure schedule.
 - i)** Existing utilities which cross or parallel proposed water main.
 - j)** Building wall, finish floor elevation, basement floor elevation (if any) and bottom of footing elevation in profile of service leads for non-residential developments.
 - k)** Continuous stationing in the plan and profile.
- 2.02** It is recognized that water mains and appurtenances to be constructed as part of a project may often need to be oversized in order to be properly integrated into the Township's system. The Township shall not bear the costs of such oversizing. The proprietor shall bear all necessary costs and provide associated easements.
- 2.03** Water mains are to be designed within or adjacent to the road right-of-way. Back or side lot locations are exceptions for special applications or serviceability difficulties.

- 2.04** All water mains shall be dedicated to the Township along with the appropriate 40-foot-wide easements. Proper easement documentation will be the responsibility of the owner.
- 2.05** Water mains shall be designed according to the Ten State Standards and the Ann Arbor Township Utility Department Standards.
- 2.06** In general, water mains shall be looped and have minimum sizes as follows:
- a) Low Density Residential - 8-inch.
 - b) Other Residential, Commercial, and Industrial - 12-inch primary looping; 8-inch secondary.
 - c) Major System Looping - 12-inch, 16-inch, and larger.
 - d) Section Line Infrastructure - 16-inch and larger.
- 2.07** Water mains shall be extended to the property lines on all sides of the subject parcel where future extension may be necessary. The locations and phasing shall be discussed with the Township.
- 2.08** In the event that an owner desires to split, divide or otherwise subdivide land in accordance with the Michigan Land Division Act, Act 288 of 1967, as amended, the Michigan Condominium Act, Act 59 of 1978, as amended, or other applicable Michigan law, Ann Arbor Charter Township, in consultation with the Utilities Department, will review the proposed water main service to the property being split, divided, or otherwise subdivided. A proposed split, division or subdivision will not be permitted by the Township unless the following requirements are met: (i) water service for the property must be provided through connection to, or extension of existing public water main located in the Township, and (ii) all proposed water main must be designed in an oversized manner, and include extensions to connect to existing or future water main, if required by the Township. The owner proposing such split, division or subdivision shall pay for all oversized improvements and extensions to the extent that such improvements (a) are required to service such property, and (b) are required for conformance with the water service master plans of Ann Arbor Charter Township.
- 2.09** Each phase shall be looped with a dual feed.
- 2.10** Valves shall be located, at a minimum, as follows:
- a) Spacing 1,000-feet maximum.

- b) Four (4) at every cross.
- c) Three (3) at every tee.
- d) Not more than three (3) hydrants between valves.
- e) Not more than three (3) commercial, industrial, or multiple family residential buildings between valves.
- f) At locations sufficient to provide the Fire Department with accessible water even if one or more valves are shut off.
- g) At temporary dead ends (the water main pipe shall be extended at least one pipe length beyond the gate well and have a temporary hydrant).

2.11 Valves shall be the same size as the water main on which they are installed. Allowable valve type shall be:

<u>Valve Size, Inches</u>	<u>Valve Type</u>
8 and smaller	Resilient wedge gate valve
12	Resilient wedge gate valve
16 and larger	Determined by the Utilities Department

2.12 Gate wells are required on valves 8-inch and larger. Gate wells shall be precast, eccentric, watertight and have a minimum inside diameter as follows:

Valve Size, Inches	Diameter, feet	
	Line Valve	Valve w/Tee
8	5	5
12	5	6
16	6	6

2.13 Clear openings in gate wells shall be a minimum of 24-inches.

2.14 Fire hydrant minimum requirements are as follows:

- a) Located such that all sides of buildings and structures will be within 300-feet of a hydrant and generally not closer than 50-feet. Measurements shall be made along the practical location of laying the fire hose.
- b) Located at intersections and major driveways.

- c)** Hydrant leads shall be 8-inch minimum. Hydrant leads may be 6-inch minimum where there is no reasonable intention for future extension and the lead is less than 10-feet from the water main.
- d)** Hydrants shall not be connected to water mains that have an unlooped length greater than 100-feet. This distance includes the 6-inch lead.
- e)** Fire hydrants shall be EJ WaterMaster 5BR-250 with two (2) 2-1/2” NST hose nozzles and one (1) 5” Storz nozzle in accordance with "Ann Arbor Township Specifications". The hydrants shall open left (counterclockwise). All hydrants shall be painted red and include all stainless-steel bolts.
- f)** Hydrants shall be located from 3-feet to 10-feet from the back of a curb.
- g)** Finished grade shall be provided on the plans.
- h)** Hydrant outlets shall face the curb best approached by fire apparatus. Final approval shall be by the Fire Department.
- i)** For all buildings that require fire department connections for their sprinkler systems, one (1) hydrant shall be located within 50-feet of the connection and dedicated to the building sprinkler system.
- j)** In potentially hazardous areas, concrete filled 8-inch diameter steel bollards shall be provided for protection of the hydrants.
- k)** Access to fire hydrants shall not be obstructed by landscaping, vehicular parking, waste containers, transformers, retaining walls, snow piles, ditches, or similar features.
- l)** The Township Utilities Department shall review and approve all hydrant locations.
- m)** During phased construction, temporary hydrants may be required by the Utilities Department to assure adequate flushing.
- n)** Hydrants are required at all temporary dead ends.

2.15 Building sprinkler systems or other approved fire suppression systems shall be required in accordance with the current Building Code in use by Ann Arbor Township.

- 2.16** Post indicator valves shall be located on all building fire service lines. They shall be at least 1.5 times the building height from the building. The domestic service shall be separately tapped and valved. Both the PIV and domestic service valve shall be located together. A minimum of 3-foot separation shall be maintained between fire service lines and domestic service lines.
- 2.17** When connecting to an existing water main, a tapping sleeve and valve and well will be required unless connection to the existing water main can be made without interrupting service on the main as determined by the Utilities Department.
- 2.18** No water main installation or portion thereof shall have a leakage exceeding 0.092 gallons per inch diameter of pipe per 1,000-feet of length per hour at an internal pressure of 150 psi. This test shall be conducted for a minimum of two (2) hours and shall not be conducted until 30 days have elapsed since installation.
- 2.19** All water main installations shall be disinfected in accordance with Michigan Department of Environment, Great Lakes and Energy Standards.
- 2.20** All water main pipe shall be Class 54 ductile iron, double cement lined. All joints shall be push on for pipe appurtenances. Watermain shall be polywrapped.
- 2.21** Service leads for 1-inch, 1 ½-inch and 2-inch shall be Type K copper. Service leads for 4-inch, 6-inch and 8-inch shall be Class 54 ductile iron, double cement lined. Each dwelling unit shall be served by a separate lead.
- 2.22** A water meter and service schematic shall be shown that includes the valves, meters, backflow preventers, and piping. The meter shall be in a heated, structurally sound room fully accessible from the building exterior or public commons interior. It shall be located within 5-feet of the water service's penetration of the exterior wall.
- 2.23** The meter room must be fully coordinated between:
- a) Site civil engineer.
 - b) Building mechanical engineer.
 - c) Building architect.
 - d) Be clearly labeled on each ground floor plan or each building type.
- 2.24** Curb boxes shall be located in green space. When it is not feasible to locate in green space, curb boxes that will be in pavement shall be protected by use of a traffic grade box and cover.

- 2.25** The minimum horizontal separation between a water main and any other utility shall be 10-feet. The minimum vertical clearance between a water main and a sewer shall be 18-inches.
- 2.26** In residential developments, the service leads shall be brought to the property side of the franchised utility easement that is adjacent to the public right-of-way or private road easement. Curb stops and boxes shall be located at the right-of-way or easement line with tails extending past the franchised utility easement. This will eliminate construction conflicts with gas, electric, phone and cable.
- 2.27** All water mains shall be installed with blue 12-gauge single strand tracer wire.
- 2.28** No water mains or appurtenances shall be constructed or allowed to remain under or within 20-feet of structural improvements.
- 2.29** All construction shall be in accordance with the current "Ann Arbor Township Standard Details and Specifications". This information can be found on the Township website.
- 2.30** Hard copy and electronic record "as-built" plans shall be submitted by the developer and reviewed and approved by the Township after construction is complete. These plans shall show the current location and elevations of all water mains and appurtenances per the Township's current requirements. The approved electronic "as-built" plans shall be in PDF and AutoCAD format and will be submitted along with the hard copy.
- 2.31** Easements shall be provided to Ann Arbor Township for all public water mains. These easements shall be prepared, executed, and recorded by the developer prior to final acceptance within three (3) months after Township approval. Easements shall be prepared in a form acceptable to Ann Arbor Township.
- 2.32** Shop drawings shall be submitted by the underground contractor for all water main and appurtenances to be installed. Shop drawings shall consist of letters of certification for all pipe, manufacturer's standard details or cut sheets for structures and appurtenances, and a manhole component part list.

CHAPTER 3

SANITARY SEWERS

- 3.01** All sanitary sewers shall be shown in plan and profile on standard 24-inch by 36-inch white prints having blue or black lines, and shall be neatly and accurately prepared to an engineering scale and contain, at a minimum, the following information:
- a) Sewer location and material type.
 - b) Sewer size (minimum 8-inch for public sanitary sewers).
 - c) Depth of invert (minimum cover 4.5-feet to invert)
 - d) Sewer slope.
 - e) Class and type of pipe for various depths.
 - f) Bedding (2NS sand minimum).
 - g) Compaction of trenches in roadway corridors and within the influence of all paving (Class II granular backfill at 95% compaction). Roadway corridor constitutes front of door to front of door in residential developments.
 - h) Building service connections - location, type, length, slope.
 - i) Manhole locations and a consecutive numbering system for all manholes.
 - j) Existing utilities which cross or parallel proposed sewer.
 - k) Building wall, finish floor elevation, basement floor elevation (if any), and bottom of footing elevation in profile of service leads.
 - l) Continuous stationing in the plan and profile, to include non-residential leads.
- 3.02** It is recognized that sanitary sewers and appurtenances to be constructed as part of a project may often need to be oversized in order to be properly integrated into the Township system. The Township shall not bear the costs of such oversizing. The proprietor shall bear all necessary costs and provide associated easements.

- 3.03** Sanitary sewers are to be designed within or adjacent to the road right-of-way with back or side lot locations an exception for special applications or serviceability difficulties. Access paths shall be provided to sewer manholes more than 20-feet from a paved surface.
- 3.04** All sanitary sewers that will service more than one property are public sewers and shall be dedicated to the Township with minimum 40-foot easements where necessary. Proper easement documentation will be the responsibility of the owner.
- 3.05** Sanitary sewers shall be designed according to Ten State Standards.
- 3.06** Sanitary sewers shall be extended to the property lines on all sides of the subject parcel. The locations and phasing shall be worked out with the Township.
- 3.07** In the event that an owner desires to split, divide or otherwise subdivide land in accordance with the Michigan Land Division Act, Act 288 of 1967, as amended, the Michigan Condominium Act, Act 59 of 1978, as amended, or other applicable Michigan law, Ann Arbor Charter Township, in consultation with the Utilities Department, will review the proposed sanitary sewer service to the property being split, divided, or otherwise subdivided. A proposed split, division or subdivision will not be permitted by the Township unless the following requirements are met: (i) sanitary sewer service for the property must be provided through connection to, or extension of existing sanitary sewer located in the Township, and (ii) all proposed sanitary sewer must be designed in an oversized manner, and include extensions to connect to existing or future sanitary sewer, if required by the Township. The owner proposing such split, division or subdivision shall pay for all oversized improvements and extensions to the extent that such improvements (a) are required to service such property, and (b) are required for conformance with the sanitary sewer service master plans of Ann Arbor Charter Township.
- 3.08** Both ground and invert elevations shall be provided at the end of each sewer line.
- 3.09** Minimum slopes shall be as follows:

<u>Sewer Size, Inches</u>	<u>Slope, Percent</u>
8	0.40
10	0.28
12	0.22
15	0.15
18	0.12
21	0.10
24	0.08

- 3.10** Service leads shall be a minimum of 4-inch and have a minimum slope of 1%. Service leads shall be SDR 26 PVC.
- 3.11** In commercial and industrial areas, all service leads shall enter manholes. In residential areas, service leads shall be connected with wyes, where practical. Leads shall not enter the manhole against the flow. They shall enter approximately 12-inches above manhole outlet invert.
- 3.12** A sewer lead schedule shall be provided on the plans showing each lead with:
- a) Lead elevation at main.
 - b) Riser height at main.
 - c) Lead length to stub.
 - d) Lead length from stub to building.
 - e) Slope.
 - f) Lowest building floor elevation.
- 3.13** Manholes shall be watertight, made of precast concrete, and have a minimum inside diameter of 48-inches. Landings are required when the depth exceeds 20-feet.
- 3.14** Clear openings in manholes shall be a minimum of 24-inches.
- 3.15** Manhole spacing shall be maximized to provide as few manholes as is practical. Maximum manhole spacing shall be as follows:

<u>Sewer Size, Inches</u>	<u>Manhole Spacing, Feet</u>
8	350
10	350
12 to 21	350
24 and larger	400

- 3.16** Manholes shall be located at:
- a) Changes of grade or direction.
 - b) Change of pipe size.
 - c) Junctions and at the end of the line.

- d) Property/lot lines where possible.
 - e) Greenbelt areas and not in sidewalks or driveways.
- 3.17** A structure schedule shall be provided on the plans showing each manhole by number that includes:
- a) Casting.
 - b) All invert elevations with size and direction.
 - c) Rim elevation.
 - d) Depth.
- 3.18** The sewer shall be deep enough to serve, by gravity, a basement.
- 3.19** House leads shall be a minimum of 4-inches in diameter within the street right-of-way. Each dwelling unit shall be served by a separate lead.
- 3.20** The 0.8 diameter points shall be matched in sanitary sewer design.
- 3.21** Internal drop manholes are required when the invert of the outlet pipe is 18-inches or more below the inlet pipe invert. Internal drop manholes shall have a minimum inside diameter of 60-inches.
- 3.22** An allowance of 0.10-foot in grade shall be made for loss of head through a manhole.
- 3.23** Downspouts, weep tile, footing drains, sump pump discharges, or any conduits that carry storm or ground water shall not be allowed to discharge into the sanitary sewer.
- 3.24** All sewers shall be televised prior to air testing. DVD recordings shall be made and given to the Township.
- 3.25** No sewer installation or portion thereof shall lose air at a rate greater than 0.003 cubic feet per minute per square foot of internal pipe surface when tested at 3.0 pounds per square inch greater than back pressure. This test shall not be conducted until 30 days have elapsed since installation.
- 3.26** SDR 26 PVC pipe shall be used for sewer depths less than 15-feet. SDR 21 PVC pipe shall be used for sewers greater than 15-feet deep.

- 3.27** Cleanouts shall be the same size as the sewer lead and shall be utilized at all bends and distances greater than 100-feet.
- 3.28** Monitoring manholes are required for all non-residential buildings. These manholes shall be located such that they are accessible by vehicle and approximately 20- to 30-feet from the building. Monitoring manholes are not required if a drop connection is used at the existing manhole. The proposed sanitary sewer will be considered a sewer lead if a drop connection is used.
- 3.29** The minimum horizontal separation between a sanitary sewer and any other utility shall be 10-feet. The minimum vertical distance between a sanitary sewer and any other utility shall be 18-inches at crossings.
- 3.30** External grease traps must be utilized for all commercial kitchen uses. A program proposal for continued maintenance and the title of the individual responsible for permanent grease trap maintenance shall be provided.
- 3.31** In residential developments, the service leads shall be brought to the property side of the franchised utility easement that is adjacent to the public right-of-way or private road easement. This will eliminate construction conflicts with gas, electric, phone and cable.
- 3.32** When an existing building is connected to the sewer system, the septic tank shall be pumped and crushed or filled with earth, per county standards.
- 3.33** All construction shall be in accordance with the current "Ann Arbor Charter Township Standard Specifications and Details". This information can be found on the Township website.
- 3.34** No sanitary sewers or appurtenances shall be constructed or allowed to remain under or within 20-feet of structural improvements.
- 3.35** Shop drawings shall be submitted by the underground contractor for all sanitary sewers and appurtenances to be installed. Shop Drawings will consist of letters of certification for all pipe, manufacturer's standard details or cut sheets for generic structures and appurtenances, and manhole component parts lists.
- 3.36** Hard copy and electronic record "as-built" plans shall be submitted by the developer and reviewed and approved by the Township after construction is complete. These plans shall show the correct location and elevations of all sanitary sewers and appurtenances. The approved electronic "as-built" plans shall be in AutoCAD and PDF format and will be submitted along with the hard copy.

- 3.37** Easements shall be provided to Ann Arbor Township for all public sanitary sewers. These easements shall be prepared, executed, and recorded by the developer prior to final acceptance within three (3) months after Township approval. Easements shall be prepared in a form acceptable to Ann Arbor Township.

CHAPTER 4
STORM DRAINAGE

- 4.01** All storm drainage systems shall be shown in plan and profile on standard 24-inch by 36-inch white prints having blue or black lines, and shall be neatly and accurately prepared to an engineering scale and contain, at a minimum, the following information:
- a) Storm sewer location and material type.
 - b) Storm sewer size (minimum 12-inch).
 - c) Cover (minimum of 42-inches to the spring line of the pipe).
 - d) Storm sewer slope.
 - e) Reinforced concrete pipe (C76-Class IV).
 - f) Bedding (Class II minimum).
 - g) Compaction of trenches in roadway corridors and within the influence of all paving (Class II granular backfill at 95% compaction). Roadway corridors constitutes front of door to front of door in residential developments.
 - h) Building service connections - location, type, length, slope.
 - i) Manhole and catch basin locations, with consecutive numbering system for all structures.
 - j) Existing utilities which cross or parallel proposed storm sewers.
 - k) A continuous stationed profile of the storm sewer, through the detention basin and outlet structure, to the ultimate outlet.
 - l) Continuous stationing in the plan and profile.
- 4.02** Design calculations shall be submitted for:
- a) Storm sewers.
 - b) Drainage ditches.
 - c) Detention basins and retention ponds.
 - d) Restricted discharges.
- 4.03** The applicant shall submit evidence that the storm drainage plan has been approved by the following agencies, if they have jurisdiction:
- a) Washtenaw County Road Commission (WCRC).

- b) Michigan Department of Transportation (MDOT).
 - c) Washtenaw County Water Resources Commissioner (WCWRC).
 - d) Michigan Department of Environment, Great Lakes and Energy (EGLE).
- 4.04** Storm drainage systems shall be designed in accordance with current WCWRC's rules. The method for computing storm runoff shall be based on WCWRC's standards.
- 4.05** Storm sewer slopes shall provide a flowing full velocity of 3-feet per second, minimum, and 10-feet per second, maximum.
- 4.06** All manholes shall be watertight, made of precast concrete, and have a minimum inside diameter of 48-inches. Landings are required when the depth exceeds 20-feet.
- 4.07** Clear openings in manholes shall be a minimum of 24-inches.
- 4.08** Maximum spacing between storm drainage structures shall be per WCWRC standards.
- 4.09** Storm drainage structures, other than manholes, shall meet the following minimum requirements:
- a) 24-inch diameter structures are permitted if the depth from rim to top of the bottom slab is less than 5-feet and the structure is at the head of a run. Structures with a depth greater than 5-feet shall have a minimum inside diameter of 4-feet.
 - b) Structures shall be precast concrete, except where standard manufacturers are unable to cast such a structure. In that case manhole block or a combination of manhole block and precast will be used.
 - c) Clear openings in structures shall be a minimum of 24-inches.
 - d) Sumps will be used at all structures receiving surface drainage.
- 4.10** Structures shall be located at:
- a) Changes of grade.
 - b) Change in direction.
 - c) Change in pipe size.
 - d) Junctions.
 - e) The end of the line.
- 4.11** A structure schedule shall be provided on the plans showing each manhole, catch basin and end section by number that includes:

- a) Structure types.
 - b) Castings.
 - c) Inverts.
 - d) Rim elevations.
 - e) Depths.
 - f) Sumps (Yes or No).
- 4.12** In general, street catch basins shall comply with the standards of the Washtenaw County Road Commission and shall be located as follows:
- a) At the radius return of street intersections. There shall be a maximum distance of 150-feet along the street between a high point and a corner catch basin when drainage is required to go around the corner. No drainage will be permitted to enter into an intersection.
 - b) At all low points in streets.
 - c) At intermediate points along the street such that there is a maximum of 400-feet of drainage draining from a high point to a catch basin or from a previous intercepting catch basin to this catch basin.
 - d) At each corner of intersections with public roads to prevent drainage from passing through the intersection.
- 4.13** Wherever sufficient grade is available, the storm sewers shall be constructed at a depth adequate to allow for gravity drainage of the building footing drains. Where grade is not available to allow for gravity drainage of the footing drains, a sump and pump shall be provided for each building with the sump pump discharge connected to the enclosed sewer system or directed to an on-site improved open drain.
- 4.14** Storm sewer pipe shall be reinforced concrete pipe (C76-Class IV). Allowable culvert pipe is reinforced concrete or corrugated metal pipe (CMP). Allowable underground storage pipe is reinforced concrete, HDPE, or CMP.
- 4.15** The discharge from detention/retention ponds shall be converted to sheet flow prior to reaching the property line of the development, unless it can flow directly into an acceptable storm sewer, drain, stream or lake.
- 4.16** No storm sewer and appurtenances shall be constructed or allowed to remain under or within 20-feet of structural improvements.
- 4.17** Shop drawings shall be submitted by the underground contractor for all storm sewers and appurtenances that he or she will install. Shop drawings will consist of letters of certification for all pipe, manufacturer's standard details or cut sheets for generic structures and appurtenances, and manhole component parts lists.

- 4.18** Hard copy and electronic record "as-built" plans shall be submitted by the developer and reviewed and approved by the Township after construction is complete. These plans shall show the correct location and elevations of all storm sewers and appurtenances. The approved electronic "as-built" plans shall be in AutoCAD and PDF format and will be submitted along with the hard copy.
- 4.19** Easements shall be provided to the appropriate authority for all storm sewers, storm drains and swales. These easements shall be prepared, executed, and recorded by the developer prior to final acceptance within three (3) months after Township approval. Easements shall be prepared in a form acceptable to Ann Arbor Township and the WCWRC.

CHAPTER 5

GRADING, DRAINAGE AND EROSION CONTROL

- 5.01** The submittal of plans to satisfy this chapter may be made as a part of the submittal under other chapters of these standards. In no way do the requirements of this chapter alter the requirements of the Ann Arbor Township Soil Erosion and Sedimentation Control Ordinance. A separate and distinct procedure is called for therein.
- 5.02** No earth change activity may commence until a soil erosion control plan and application have been approved, a permit issued, and the soil erosion control measures inspected and approved. All trees shown on the approved site plan as being saved shall be tagged and have a protective fence placed around them at the outer edge of the drip line.
- 5.03** Grading plans shall be drawn with existing and proposed contour lines at one-foot intervals. Spot elevations may be provided but shall not substitute for contour lines.
- 5.04** A grading plan shall show all the changes on the site required to convert it in its predevelopment state to a completed development.
- 5.05** Proposed contour lines shall connect with existing contour lines within the site unless grading easements are obtained from adjacent property owners. A clear distinction shall be made between proposed and existing contours.
- 5.06** Proposed grades shall generally not exceed a slope of 1 on 4. If a slope greater than 1 on 4 is necessary, the surface shall be planted with a ground cover that is suitable for stabilizing the surface.
- 5.07** Grading plans shall show tree protective fencing around all trees and vegetation to be preserved. The limits of disturbance shall be located outside of the drip line of any tree or vegetation to be preserved. Any “protected” tree, as defined by the Zoning Ordinance, near the grading limits shall have tree protection fencing installed at or outside of the drip line.
- 5.08** If the limits of disturbance are located within in the drip line of a tree that has a reasonable chance of survival post construction, such tree shall be noted as an “Impacted Tree” on the plan and every effort shall be made to protect it, including but not limited to additional tree protection measures such as those shown on the Township standard details. A performance guarantee shall be provided to the Township in an amount approved by the Township Planner to ensure replacement of any Impacted Tree that should die within three (3) years of final approval of the construction.
- 5.09** All graded areas shall be planted or otherwise protected from wind or water erosion within five (5) days after final grading. Other means of stabilization may be substituted for plantings in unique situations if approved by the engineering department or Township certified soil erosion control agent. The plantings and other means of stabilization shall be properly maintained.
- 5.10** All contour lines and spot elevations shall be based on NAVD88.

- 5.11** Every parcel shall provide positive gravity drainage.
- 5.12** The grade from a house to its adjacent street shall be not less than one percent (1%) and the proposed finished ground grade at the building shall not be less than 12-inches above the top of curb.
- 5.13** Roof downspout discharges and footing drain sump discharges shall be directed to the stormwater system.
- 5.14** The longitudinal grade of rear and side yard drainage shall not be less than two percent (2%).
- 5.15** Overland drainage shall generally not cross from one lot onto another. When cross-lot drainage is permitted by the Township Engineer, the drainage shall be in a swale located on the lot line and within a drainage easement.
- 5.16** The finished first floor, garage finished floor and basement elevations, if applicable, shall be provided on the grading plan. For single family homes it is understood that these elevations may vary slightly during construction based on the actual location of the house on the lot and the builder's choice of house type. However, all proposed deviations shall be approved in advance of construction.
- 5.17** No grading is allowed within the floodplain boundary without an EGLE Permit.
- 5.18** When applying for a building permit for a single-family home in an area with an approved grading plan, the builder shall submit the following on a plot plan:
- a)** North arrow.
 - b)** Scale.
 - c)** Name, address, and phone number of the applicant and the person or company who prepared the plan.
 - d)** Site information for the lot or unit, including floor area ratio, lot coverage and net lot coverage.
 - e)** Lot lines with dimensions and bearings.
 - f)** Location and dimensions of all proposed structures and proposed setbacks from all property lines consistent with the Zoning Ordinance.
 - g)** Street name and right-of-way width.
 - h)** Location of existing water, sanitary and storm mains including manholes, structures, gate wells and hydrants within the vicinity of the site. Existing service lead stubs for each utility shall also be shown.

- i)** All proposed service leads for water, sanitary and storm with sizing shall be extended to the house. Proposed leads shall be differentiated by line type from existing leads.
- j)** All adjacent lots to the site shall be labeled with lot number and identified as either vacant or with an existing building. Proposed spot grades from adjacent lots under construction shall be shown consistent with the adjacent lot plot plan.
- k)** The location and elevation of regulated 100-year Floodplain boundaries.
- l)** Soil Erosion and Sedimentation Control measures.
- m)** Trees to be protected shall be shown. Any protected tree near the grading limits shall have tree protection fencing installed at or beyond the drip line.
- n)** Existing and proposed elevations at the following locations as listed below in Items i. - ii. NOTE: (The elevations along lot lines shall conform to the Township approved final plan. House finish grades may also be varied from the approved plan (+/- .5-foot) as long as acceptable grades away from the house are maintained.
 - i.** Each lot corner (front and rear), side lot (at 50-foot intervals), and all high points and ridge lines shown to the nearest tenth of foot. Proposed drainage arrows shall be shown to designate the direction of proposed flow.
 - ii.** Whenever proposed swales (side or rear yard) for lot drainage are called for on the plan, swale elevations shall be required at the high point of the swale and at 50-foot intervals along the swale. The high point of the swale shall be a minimum of 0.50-feet below the proposed finish ground elevation of the house. Proposed drainage arrows shall be shown to designate the direction of proposed flow. A minimum of 2% grade shall be maintained for all swales.
- o)** Finish floor, finish grade and top of footing elevations shall be provided and make sense in relation to each other.
- p)** Proposed contours at 1-foot intervals.

5.19 Driveways:

- a)** Show location and width for proposed drive(s).

- b) Maximum slope of driveways shall be 6%.
- c) The driveway shall not interfere with side or front yard drainage.
- d) Edge of drives shall be offset a minimum of 3-feet from side lot line.

5.20 Retaining Walls:

- a) Walls greater than 4-feet in height shall require an engineering analysis from a structural engineer prior to issuance of a Building Permit. In addition, a separate permit from the Building Department will be necessary for construction of this wall.
- b) Unless adjacent to a driveway or parking lot, walls less than 4-feet of height will be considered landscape walls and do not require an engineering analysis.
- c) Retaining walls (other than for decorative purposes) are generally unacceptable. Where absolutely necessary due to steep slopes or to preserve natural features, retaining walls shall not exceed 5-feet in height without terracing. Terraced retaining walls shall be separated by minimum of 5-horizontal feet.

5.21 SESC Permit (necessary for lots/parcels that are within 500-feet of a lake/stream/pond or lots/parcels over one (1) acre disturbed that are outside of a recently established subdivision covered under blanket SESC permit for the site) must be issued prior to issuance of Building Permit.

5.22 Grading around and in detention basins shall meet the requirements of the WCWRC.

5.23 No building may be closer than 20-feet from the 100-year high water elevation, measured horizontally.

5.24 In the above mentioned 20-feet, the maximum slope away from the buildings shall be 10%.

5.25 All material used for fill, under structural improvements, shall consist of readily compatible materials meeting the following minimum requirements:

- a) No inclusion of organic or other deleterious materials which may be subject to decay shall be permitted.
- b) All fill shall be free of ice or snow.
- c) No rock with a maximum dimension greater than 8-inches shall be buried within 2-feet of finished grade or within 2-feet of a foundation base.

CHAPTER 6

PAVEMENT AND CURBS

- 6.01** The applicant shall submit evidence that the road paving design has been approved by the Washtenaw County Road Commission or the Michigan Department of Transportation, for projects that fall under their jurisdiction.
- 6.02** Parking lots and driveways shall have well-drained prepared subgrades. Minimum grade shall be 1%. Maximum grade shall be 6%. Adequate means of collecting and disposing of the drainage shall be provided.
- 6.03** Minimum paving thickness for parking lots and driveways shall be one (1) of the following alternates:
- Alternate A: 3.5-inch type 13A (leveling) and 13A or 36A (wearing) bituminous asphalt applied in two (2) lifts, over 7-inch 21AA limestone 95% compacted aggregate.
- Alternate B: 6-inch reinforced concrete MDOT Grade P1.
- 6.04** Gravel surfaces shall be a minimum of 8-inches MDOT – 21AA limestone.
- 6.05** Test results of paving shall be provided by the developer through an independent testing laboratory and submitted to and approved by the Township Engineer before the certificate of occupancy is issued or the performance guarantee is released, whichever applies. Testing requirements are as follows:
- a) Subbase - one compaction test and one depth measurement per every 10,000-square-feet of surface, but at least two (2) tests.
 - b) Asphalt pavement - one (1) nuclear density test and one (1) thickness measurement per every 10,000-square-feet of surface, but at least two (2) tests.
 - c) Concrete pavement - one (1) air entrainment test, one (1) slump test and one (1) compressive strength test per every 20,000-square-feet of surface, but at least two (2) tests.
- 6.06** All paving shall be performed in accordance with the current Michigan Department of Transportation Standard Specifications for Construction.
- 6.07** All curbing shall be Portland cement concrete in accordance with the most recent Michigan Department of Transportation Standard Specifications for Construction. Asphalt curbs shall not be permitted.

6.08 Where drainage is intended to run along the curb, an integral curb and gutter shall be used.

CHAPTER 7

SIDEWALKS

- 7.01** Sidewalks shall have a minimum clear width of 5-feet and shall be constructed of Portland cement concrete. When they abut perpendicular parking, sidewalks shall have a minimum width of 7-feet.
- 7.02** Sidewalks shall be at least 4-inches thick, except at driveways where they shall be at least 6-inches thick. They shall be laid on a 4-inch thick sand base, 6-inch 21AA base, or other approved base.
- 7.03** All sidewalks and ramps shall be designed and constructed to meet current ADA standards. The design engineer shall certify that all sidewalks meet current ADA standards. If an exemption from the ADA standards is claimed, the specific deviation shall be specified and a legal opinion shall be provided.
- 7.04** Sidewalks shall be provided where required by the Planning Commission to achieve convenient pedestrian movement about and among properties.
- 7.05** In general, sidewalks shall be located within the street right-of-way, 1-foot from and parallel to the future right-of-way line. Exceptions will be made to accommodate existing conditions such as trees, utility poles and appurtenances, and distance to curbs.
- 7.06** Pedestrian paths located outside street rights-of-way may be constructed of materials other than Portland cement concrete, with recommendation of the Township Engineer, and approval of the Planning Commission.
- 7.07** No downspout or sump pump discharge drainage shall be permitted to flow over any concrete sidewalk.
- 7.08** Where sidewalks intersect pavement at approaches/drives, the sidewalk shall be carried through.

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CHAPTER 8

DRIVEWAYS

- 8.01** A driveway which intersects a paved street shall be paved for a minimum distance of 50-feet from the pavement edge of the road, even if the remainder of the drive is not to be paved. Single family residential lots shall not be subject to this requirement.
- 8.02** Driveway slopes shall provide a smooth, uninterrupted movement of traffic from the street to the site. The slope shall be low enough to prevent undercarriage drag or vehicle bouncing, in order to permit safe entry and exit when the drive surface is wet. The minimum slope shall be 1% and the maximum slope shall be 6%.
- 8.03** Curve radii at drive intersections with streets shall be large enough to permit smooth, uninterrupted movement of traffic between the site and street.
- a) On County roads, the standards of the Washtenaw County Road Commission shall apply.
 - b) On State trunk lines, the standards of the Michigan Department of Transportation shall apply.
 - c) On all other roads, driveway intersection radii shall generally meet County Road Commission standards unless the nature and speed of traffic on the road justify a lesser standard.
- 8.04** The angle of the driveway intersection with the street shall be 90 degrees unless a directional one-way flow of traffic is intended, in which case the angle of deflection from the street to the drive shall not be less than 45 degrees.
- 8.05** Driveways shall be designed to accommodate existing and future sidewalks. These sidewalks shall be ADA compliant.
- 8.06** Where sidewalks intersect driveways, the sidewalk shall be carried through.

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CHAPTER 9

FRANCHISED UTILITIES (Electric, Telephone, Gas, TV, Radio Towers)

- 9.01** All procedures, design and construction of utilities shall be in conformance with the requirements of the supplying utility company.
- 9.02** Plans of all proposed utilities, whether or not in public easements, shall be submitted by the utility company to Ann Arbor Township for review. Ann Arbor Township will issue a construction permit to the utility company when their plans are approved.
- 9.03** Every effort shall be made to install all proposed electrical, telephone, and cable utilities underground for their full length. Specific approval by the Township Board or its authorized representative shall be required for the placement of above ground utilities and shall be based on a showing of substantial difficulty with underground installation. Existing overhead utilities on site shall be relocated underground.
- 9.04** Surface equipment shall be located so as not to interfere with traffic flow, parking, building access, fire hydrants, fire department connections, or with existing natural features to be preserved, such as trees.
- 9.05** Surface transformers, pedestals and similar equipment shall be screened from view on the property line and the screening shall be shown on the landscape plan.
- 9.06** Conditional Use Permits shall be obtained by the utility as required by the Zoning Ordinance of Ann Arbor Township.
- 9.07** Electrical, telephone, gas and television lines may not share a common trench with sewer and water mains and shall maintain a minimum of 10-feet of separation from them.

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CHAPTER 10

TRAFFIC CONTROL DEVICES

- 10.01** All required traffic control devices shall be installed at developer expense.
- 10.02** All required traffic control devices shall meet the specifications of, and shall be installed in accordance with, the Michigan Manual of Uniform Traffic Control Devices.
- 10.03** Traffic control devices may be required on private property that is open to the general public for travel, in accordance with the Ann Arbor Township's Uniform Traffic Code.
- 10.04** Code enforcement of these devices shall be coordinated with the Deputy Sheriff assigned to Ann Arbor Township. The Township may require that the proprietor enter into an agreement with the Township to enforce the Uniform Traffic Code on the property. All required traffic control devices and street name signs shall be installed prior to any building permit being issued on single family developments and before any Certificate of Occupancy is issued on all other types of developments.
- 10.05** Signage shall be installed at speed bumps and speed tables, on both sides of the roadway. The speed bump and speed tables should be painted for easy detection.

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CHAPTER 11

OCCUPANCY

- 11.01** The granting of Certificates of Occupancy shall be guided by Chapter 74 of the Ann Arbor Charter Township Code or Ordinances.
- 11.02** In addition to the requirements of Chapter 74 of the Ann Arbor Charter Township Code of Ordinances, occupancy shall not be permitted until the following minimum standards for completeness and safety are achieved:
- a)** In residential projects, roadway, drives, and parking areas other than those on individual lots shall be completed, at a minimum, through the permanent compacted aggregated base.
 - b)** In nonresidential projects and in multi-family residential developments with common drives and parking areas the roadway, drives, and parking areas shall be completed, at a minimum through the base course of asphalt. Where pavement markings and traffic control devices are required to direct the general public about the site, they shall also be completed prior to occupancy.
 - c)** All facilities for the direction and retention of stormwater shall be complete. Site grading shall be generally complete.
 - d)** The installation of all franchised utilities shall be complete.
 - e)** Final mechanical, plumbing, electrical, building, site, grading, utility, and fire safety inspections shall have been approved on, at least, a temporary basis by the applicable inspectors for the structure for which occupancy is requested.
 - f)** The structure shall bear a permanent address visible from the street. For single residences, a reflective address sign shall be installed at the edge of road.
 - g)** A Township installed water meter or Utilities Department-approved installation must be complete.
 - h)** All water main, sanitary sewer and storm water systems must be complete and approved by the Township Engineer and Utilities Department. Any outstanding permit fees must be paid in full.
 - i)** As-built drawings and easements for roads and utilities must be submitted by the developers.

- j)** Where applicable, approval of individual wells and septic facilities shall be obtained from the Washtenaw County Health Department.
- k)** Commercial food service facilities shall be approved by the Washtenaw County Health Department.

CHAPTER 12

ADDRESSES, STREET AND PROJECT NAMES

- 12.01** All addresses, street names and project or development names shall be assigned and/or selected in accordance with the following criteria and subject to approval by the Zoning Official.
- 12.02** The Zoning Official shall have the sole responsibility and authority for the assignment of addresses in Ann Arbor Township. The Zoning Official may send a request to USPS and Public Safety for comment.
- 12.03** All addresses shall be assigned by the Zoning Official. In projects with multiple phases, addresses will be assigned as each phase is approved. The address shall be displayed on every lot, parcel, or site prior to the commencement of any development and continuously thereafter. The address shall be visible from the road.
- 12.04** Address signage shall be clearly visible from the road, including at night, and shall meet the requirements of the 2021 International Fire Code, Section 505, Premises Identification, or latest version.
- 12.05** Addresses will be assigned only on public or approved private roads. Addresses will not be assigned on private driveways or other private access roads unless, in the opinion of the Zoning Official, it is required due to high density or other unusual circumstances. In the event that addressing is required on a private road, or private drive or access road, the developer shall install and maintain approved road name signs which comply with the standards of the Washtenaw County Road Commission for road identification signs. Structures with frontages on more than one road will be addressed based on the road frontage the front or main entrance faces regardless of the location of vehicular entrances.
- 12.06** In single and multiple-family residential projects, an individual address will be assigned to every structure or unit which has an individual tax parcel ID number.
- In non-residential projects each building will be assigned an address. Where a non-residential building has more than one tenant either additional addresses or individual unit numbers may be assigned at the discretion of the department.
- 12.07** Subdivision and project names shall be selected by the developer and submitted to the Zoning Official and other reviewing agencies for approval. There shall be no duplicate or similar sounding names with any project in this or any bordering community.
- 12.08** Street names shall be selected by the developer and submitted to the Zoning Official and other reviewing agencies for approval. Names shall be reviewed during review of the area plan, preliminary site plan or tentative version of the preliminary plat. There shall be no duplication of any street name in use in any postal zip code serving or adjacent to Ann Arbor Township. This currently includes the 48103, 48108, 48176 and 48197 zip code areas. Similar-sounding names shall also be prohibited. (Examples are names like Stonebridge and Stoneridge) Street names using the suffix "Court" must be a unique name or be accessed from a street having the same name.

The suffixes "Road", "Avenue", "Street" and "Drive" shall be considered the same and shall not be used to differentiate among duplicative or similar-sounding names.

CHAPTER 13

FIRE PROTECTION AND PREVENTION

13.01 Accessibility:

- a) Site plans shall provide more than one point of access to the site. Access points must be approved by the Fire Chief.
- b) Emergency access routes must be capable of handling the weight of fire apparatus, must be at least 20-feet wide in setup areas and a minimum of 15-feet wide for ingress/egress. The surface shall be approved gravel, asphalt, cement, or pavers. Grass pavers or similar surfaces are not allowed. All Emergency access routes must be approved by the Fire Chief or designee.
- c) Emergency only access roads must be clearly marked by signage stating, "Emergency Access Only" at entrance points and "Fire Lane, No Parking, No Standing," every 75-feet along the road as designated by the Fire Chief or his designee. Entrance points must discourage non-emergency traffic while not impeding emergency apparatus.
- d) Emergency access roads are preferred to encircle the structure(s). Dead end emergency access roads, depending on length, must provide a cul-de-sac or hammer head type turn-a-round approved by the Fire Chief or designee. In certain circumstances based primarily on length and access, a turn-a-round may not be required as determined by the Fire Chief or designee.
- e) Ingress/egress gates, barricades or obstructions must provide approved fire department "Knox Boxes/Knox Locks" for entry.
- f) Minimum clear width of a fire lane shall be 20-feet. The minimum clear height of a fire lane shall be 13.5-feet, including canopies, bridges, etc.

13.02 Alarm Systems:

- a) Alarm systems must be installed in all buildings according to NFPA 72.

13.03 Annunciator Panels:

- a) The Annunciator Panel for the alarm/suppression systems must be located just inside of the main entrance and visible from the main entrance as well. Zone locations with legends must be available to be placed inside of the Knox Box.

13.04 Dry or Wet Hydrants:

- a) Hydrant placement shall be measured as “hose laying distance” from fire apparatus. Hose laying distance is the distance the fire apparatus travels along approved access routes between hydrants or from hydrant to structure.
- b) Fire Hydrant minimum requirements shall be located, so that all sides of buildings and structures will be within 300-feet of a hydrant and generally not closer than 50-feet. Measurements shall be made along the practical location of laying the fire hose.
- c) In single-family residential areas consisting of five (5) or more homes, an adequate water supply must be considered and recommended by the AHJ and approved by the Township Board as recommended by the Planning Commission.
- d) Dry hydrants shall be at least 3-feet, but no further than 6-feet from the back of the curb or road edge. Height of hook-up point shall be 24- to 30-inches.
- e) Hydrant location shall be determined by the Fire Chief, Township Engineer and Utilities Director. Hydrants should not be located in the collapse zone of a building.
- f) Hydrants shall be protected by curbs, guard posts, guard rail, or other acceptable methods if determined to be in a hazardous location.
- g) Additional hydrants may be required depending on the type of hazard or use to protect the structure and/or contents.
- h) Hydrants must meet Ann Arbor Charter Township Fire and Utility Department specifications. A “5-inch Storz” steamer with two (2) 2½-inch connections is required.
- i) Site plans shall note water sources including all dimensions of ponds, rivers, accessibility, and a minimum of 2-feet below the 50-year drought level, as determined by a registered Engineer.
- j) Completion of dry hydrants, underground water storage tanks or static water supplies must be in compliance with Ann Arbor Township Fire Department installation guidelines. Additional information can be found on the Township Website.
- k) Hydrants shall not be blocked by obstructions.

- l)** Dry hydrants should be marked with a department-approved sign identifying the location of a dry hydrant. A sample sign can be found on the Township website.

13.05 Fire Department Connections:

- a)** Fire Department Connections (FDC) shall be 5-inch Storz and shall be located and be visible from the street or in a location approved by the Fire Department.
- b)** Fire Department Connections shall be located so that firefighters and fire apparatus can have immediate access. Obstructions such as fences, bushes, trees, walls, electrical transformers, dumpsters, vehicles, gas meters, or other similar objects shall not be permitted for new or existing installations. There shall be 15-feet of clearance around FDC's.
- c)** Fire Department Connections (FDC) are to be identified by an FDC sign located directly inline and above an FDC approximately 10-feet off the ground. Buildings with multiple FDC's, that have separate sprinkler suppression system zones, must have a strobe/horn warning device or water gong located above the FDC. The strobe/horn or water gong are to only activate when water is flowing through the suppression system that would be supplied by the FDC with the strobe/horn or gong that is activated. The FDC sign shall be a sign with a white background with red reflective letters spelling FDC with a red arrow pointing towards the FDC. The red reflective letters are to be not less than 12-inches tall.
- d)** Fire hydrants and/or water supplies are important, especially when sprinklers and standpipe systems are installed. There shall be a designated fire hydrant for each FDC. The distance between the hydrant or water supply and the FDC will need the approval of the fire department. The distance from the hydrant and the FDC shall not exceed 50-feet.

13.05 Fire Pumps:

- a)** Fire pumps for High Rise and other large buildings shall be supplied by dual feed lines.

13.06 Knox Box/Locks:

- a)** The Knox Box must be located and visible while standing outside the main entrance of the building. All site-specific information must be available for fire department use. The Knox Box content includes "As Built Prints". "Knox Locks" may be used to secure access gates when approved by the Fire Chief or his designee.

i) Knox Box contents:

- Fire department Site Plans including “As Built” current prints (see “Site Plans” later in this Chapter).
- At least two (2) complete sets of access keys, fobs, cards, etc. Additional sets may be required by the Fire Department.
- Emergency contact information
- Elevator & Firefighter Keys
- Liquid run off information
- Hazardous materials information
- Firefighter Right-Know
- Tunnel, hatchway, confined space information
- Stairwell locations
- Shelter locations
- Company Emergency Action Plans

13.07 Multiple Story Buildings:

- a) Multiple Story Buildings (over three (3) stories) with atriums shall have beam detectors at the third level.

13.08 Radio Coverage in Building:

- a) In some large buildings, radio communications are inadequate due to the construction materials or design of the building. Therefore, on new buildings or major renovations, radio repeaters/amplifiers may be required to the extent feasible given current technology.

13.09 Roof Ladders/Stairs:

- a) May be required for uneven roof elevations greater than 24-inches to accommodate Fire Department operations during an emergency.

13.10 Signage:

- a) Location of “Fire Lane, No Parking, No Standing,” or “Emergency Access Only,” or “Authorized _____ Parking Only,” type signs shall be designated by the Fire Chief or his designee and the Zoning Official in accordance with applicable ordinances. They shall be spaced 75 feet apart.
- b) Water Storage tanks and Fire department draft connections shall have a sign approved by the Fire Department. A sample sign can be found on the Township Website.

- c) Fire department road/parking type signage shall be 12-inch by 18-inch and meet the adopted International Fire Code and National Fire Protection Association Life Safety Codes.
- d) Curb, asphalt, or cement painting (red or yellow paint) may be required in fire lanes or authorized parking areas.
- e) Fire Department Connections shall be marked with signage approved by the Fire Chief or his designee.
- f) Red signs with white lettering shall be installed on fire suppression access doors for suppression systems, ventilation, etc. (3/4-inch letters minimum)
- g) Signage on mechanical, electrical, elevator, roof access, HVAC rooms (signage to match with equipment on roof), etc. is required.
- h) Exit routing signs shall be placed throughout the building and approved by the Fire Chief and Building Official.
- i) Location signage shall be placed throughout the building to assist with ingress/egress (“You are here” type signage).

13.11 Standpipes:

- a) Standpipe hose connections are required in buildings with extensive corridors or long travel distances. These hose connections are required in single-story buildings as well as in multi-story buildings. Single-story hose connections shall be located towards the center of the building as to accommodate shorter hose lays for firefighting. Multi-story buildings shall have hose connections located in stairwells to accommodate shorter hose lays in upper levels of buildings. The hose connections shall be 2½-inch NST diameter with 2½-inch to 1½-inch reducer and cap provided. The Fire Chief/Marshal or designee shall determine exact location and number of standpipe hose connections.

13.12 Site Plans:

- a) Fire protection plans shall be on a separate sheet(s) for all site plans, and must show an overall exterior footprint of the building and grounds that include: roads, parking areas, ingress/egress (building and property), hydrants, water mains, post indicator valves (PIVs), Fire Department connections, gas, electric, hazardous storage, water supplies, storm and sanitary sewers, etc. The site plan shall show the fire apparatus turning template maneuvering the site. Any special site limitations such as apparatus weight, height, etc. shall be noted on the plan. In addition to these

requirements, final site plans shall show interior layouts that include ingress/egress, fire suppression equipment, mechanical rooms, electrical rooms, roof access, attic access, hazardous material rooms, Annunciator panels, Knox Box, elevators, standpipes, hose outlets, inspector test valves, etc.

13.13 Sprinkler Systems:

- a) All buildings must have fire suppression systems installed according to NFPA 13.

13.14 Parking Structures (above or below grade):

- a) A vertical clearance of 8-feet shall be maintained throughout the structure, including drive in angles at entrances and exits. This is required to allow accessibility of small style emergency apparatus. Adequate ventilation (with emergency on/off power) is required especially in below grade or enclosed structures. Stairways leading out of the parking structures to the outside are required for emergency egress.