



City of NAPOLEON

ENGINEERING DEPARTMENT

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Chad Lulfs, P.E., P.S.

July 18, 2006

Pilot Travel Centers, LLC
5508 Lonas Road
P.O. Box 10146
Knoxville, TN 37909

Attn: Brad Alsup

Re: Pilot Travel Center
905 American Road, Napoleon, OH

Dear Mr. Alsup,

I have reviewed the plans for the above referenced project. Following is a list of items that need to be addressed:

1. Drawing C5.1: The Typical Section details for the asphalt concrete pavement call for O.D.O.T. 404 and 402. Please note that these item numbers no longer exist. The current item number is 448. The City of Napoleon uses Asphalt Concrete Surface, 448 Type 1, Medium Traffic, PG64-22 and Asphalt Concrete Intermediate, 448 Type 2, Medium Traffic, PG64-22. The City of Napoleon does not require you to use these specific mix designs, but they may be used as a basis for your requirements.
2. Drawing C6.1: Please note that the detail for "Block & Gravel Sediment Barrier" specifies for T.D.O.T. stone. This should be revised for O.D.O.T. stone. Also, the "Sanitary Sewer Clean-out" detail shall call for all sanitary sewer piping to be PVC ASTM D3034 SDR-35.
3. Drainage/detention calculations for the site must be submitted. A copy of the City of Napoleon's drainage calculation requirements has been enclosed.

Copies of the plans have been forwarded to the Operations Superintendent. If he has any comments, those will arrive under a separate letter. If you have any questions or require additional information, please contact me at your convenience.

Yours truly,



Chad E. Lulfs, P.E., P.S.
City of Napoleon Engineer

Enc.

CEL/als

cc: Jeff Marihugh
John Becker
Dr. Jon A. Bisher

TEMPORARY CUL-DE-SACS SHALL HAVE A MINIMUM RADIUS OF THIRTY-FIVE FEET (35') AND SHALL BE CONSTRUCTED OF TWELVE INCHES (12") OF COMPACTED AGGREGATE BASE (ODOT ITEM 304) INSTALLED IN TWO (2) LIFTS.

The arrangement of streets in new subdivisions shall provide for the continuation of the principal existing streets in adjoining areas.

The angle of intersection between any street and an arterial street shall not be less than eighty degrees (80°) as measured from the centerline of each street. All other streets shall not intersect at an angle less than seventy degrees (70°).

Except in extreme cases, dead end streets shall not be permitted. Where a dead-end is permitted, a cul-de-sac shall be provided at the terminus of the street. Cul-de-sacs shall have a minimum radius of fifty feet (50^{ft}) as measured to the back of curb.

Horizontal curves shall be provided where the horizontal deflection exceeds two degrees (2°), fifteen (15) minutes. Horizontal curves shall not exceed the following:

1. The maximum degree of curve shall be eleven degrees (11°), thirty (30) minutes for arterial streets; and
2. The maximum degree of curve shall be sixteen degrees (16°), thirty (30) minutes for all other streets.

A TYPE "A" MONUMENT SHALL BE PLACED AT EACH CHANGE IN DIRECTION OF THE CENTERLINE OF RIGHT-OF-WAYS, THE INTERSECTION OF CENTERLINES OF ALL STREET RIGHT-OF-WAYS, THE CENTERLINE OF RIGHT-OF-WAY AT THE END OF ALL PHASED CONSTRUCTION, AND THE CENTER OF ALL PERMANENT CUL-DE-SACS.

Rule 4.1.6 Storm Sewer Sizing

An overall drainage area layout plan showing the limits of the area contributing to each drainage pickup point, shall be submitted with the detailed construction plans. The drainage design within the development shall be adequate to handle the entire contributing watershed area, along with its existing, proposed or probable future development, and not just the area being submitted for approval.

If the development is to be completed in phases, the overall drainage plan shall be submitted with the first set of detailed construction drawings and the storm outlet for the entire development shall be included for construction within the first phase.

Storm sewers shall be sized using the "Rational Method" ($Q = CIA$). The storm sewers shall be designed to flow just full for a five (5) year storm event. The hydraulic grade for each segment of sewer shall be checked by using the ten (10)

year intensity-duration-frequency curve. The initial time of concentration (Tc) shall be not less than twenty (20) minutes.

The runoff coefficients (C) to be used shall be based on a weighted coefficient of runoff using the following ranges:

<u>Type of Ground Cover or Development</u>	<u>Runoff Coefficient (C)</u>
Concrete or Asphalt Pavements	0.90
Roof Areas	0.90
Gravel Roadways	0.50
Undeveloped Sites	0.20

Catch basin and curb inlet crossovers shall be twelve inch (12") nominal diameter and placed at no less than one percent (1%) slope.

Catch basins and curb inlets shall be constructed per the City of Napoleon Standard Construction Drawings.

Storm taps shall be provided for residential and commercial lots. Storm taps shall consist of a six inch (6") wye connected to the pavement under drains and a non-perforated six inch (6") crossover extended to the right-of-way line for each building lot in a development. The location and the elevation of the storm tap at the right-of-way line shall be shown on the detailed plans. Storm taps shall be utilized as outlets for footer drains and sump pumps only. Downspouts shall outlet onto the ground surface.

Rear yard drainage shall be provided by means of drainage swales and/or catch basins located between lots.

Manholes shall be provided at intervals not to exceed four hundred feet (400'), at all changes in size, direction or grade, at the connection point between two (2) or more sewers and at the upper terminus of the sewer.

A headwall with dump rock fill shall be provided at the outfall of a proposed storm sewer. Dump rock fill shall be ODOT Item 601.07 Type C.

The proposed outlet for the storm drainage system must be approved at the time of the preliminary plan. If a sufficient outlet or receiving stream is not available to carry all of the runoff from the watershed, a method of on-site retention or detention of storm water shall be provided. Calculations for the sizing of a retention/detention pond or basin shall be based upon the following criteria:

Any increase in the volume of storm water runoff caused by site development shall be controlled such that the post-development peak rate of discharge does not exceed that of pre-development for all twenty-four (24) hour storms between the two (2) year frequency and the critical storm, as subsequently defined. In other words, when required, facilities shall be provided such that the volume of water equal to that produced under post-development conditions for the critical storm may be retained or detained on site while discharging at a rate not to exceed that produced by a two (2) year storm under pre-development conditions.

The method by which the Owner or Engineer shall determine the changes in rates of runoff and runoff volumes is presented in Urban Hydrology for Small Watersheds (TR-55) as prepared by the US Department of Agriculture, Soil Conservation Service, Engineering Division and dated June, 1986. TR-55 is supplemented by the Ohio Supplement to Urban Hydrology for Small Watersheds.

To determine the critical storm for which control is required, the Owner or Engineer shall:

Calculate the storm water runoff for a two (2) year frequency, twenty-four (24) hour storm for undeveloped conditions ($C = 0.20$) and post-development of the site. The maximum allowable runoff from the proposed site shall be pre-development runoff.

Subtract the pre-development runoff from the post-development runoff and divide by the pre-development runoff to determine the percent of increase.

Determine the critical storm frequency for which for which storm water control is required from the following table:

Storm Frequency Requirements		
Equal to or Greater Than (%)	Less Than (%)	Storm Frequency (Years)
--	20	2
20	50	5
50	100	10
100	250	25
250	500	50
500	--	100

Example (critical storm):

Development Area = 6.25 acres

Pre-development "C" = 0.30 Post-development "C" = **0.7580**

2 year, 24 Hour Rainfall = 2.60 inches (Table OH-1, TR-55 Ohio Supplement)

$$Q2A = (0.30) * (2.60) * (6.25) = 4.88 \text{ CFS}$$

$$Q2B = (0.80) * (2.60) * (6.25) = 13.00 \text{ CFS}$$

$$(Q2B - Q2A) / (Q2A) = (13.00 - 4.88) / (4.88) = 1.66, \text{ or } 166\%$$

Therefore, the critical storm is the twenty-five (25) year frequency, twenty-four (24) hour storm.

Develop a unit hydrograph of the critical storm for the proposed development, including a horizontal line at the rate of allowable discharge (Q2A). Calculate the

area beneath the curve and above the horizontal line. This will equate to the volume of retention or detention required.

Rule 4.1.7 Traffic Control Devices

THE PLACEMENT OF ALL TRAFFIC CONTROL DEVICES AND SIGNAGE THAT WILL BE CONTAINED IN THE DEVELOPMENT BY THE OWNER OR DEVELOPER, DEMONSTRATING PLACEMENT IS IN ACCORDANCE WITH STANDARDS DEFINED IN THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS ON FILE WITH THE CITY, OR AS OTHERWISE DIRECTED BY THE CITY ENGINEER.

Rule 4.2 Sanitary Sewers

Rule 4.2.1 General

All sanitary sewers shall meet all of the requirements of the Ohio EPA and the City of Napoleon Standard Specifications for Construction.

Rule 4.2.2 Sewer Extensions

If a development can be reasonably served by the extension of an existing sewer, as determined by the City Engineer, the Owner, Developer or their Agent may petition the City for the extension of said sewer. (See also City of Napoleon Rules for Water and Sewer Service.)

Rule 4.2.3 Lift Stations

When a subdivision cannot be readily serviced by a sewer extension of an existing sanitary sewer by gravity flow, a lift station shall be required.

Lift stations shall be constructed at the cost of the Owner or Developer and shall be of the wet-well - dry-well type and shall include telemetering equipment.

The drawings and specifications for lift stations shall be submitted for approval with the detailed construction plans.

Rule 4.2.4 Sanitary Sewers **SERVICES**

Sanitary sewers shall be a minimum of eight inches (8") in diameter and shall be constructed with six inch (6") diameter service connections **TO WITHIN FIVE FEET (5') OF THE STRUCTURE FOUNDATION** for each proposed lot or unit within a development.

Service connections shall be constructed at no less than one percent (1%) slope, **NOT GREATER THAN THREE PERCENT (3%) SLOPE** and shall outlet directly into the sewer main, not into manholes **UNLESS AUTHORIZED BY THE CITY ENGINEER.**

Manholes shall be provided at intervals not to exceed four hundred feet (400') , at all changes in size, direction or grade, at the connection point between two (2) or more sewers and at the upper terminus of the sewer.