



MEMORANDUM

To: Mayor and City Council

From: Kenneth M. Griffin, P.E., Director of Engineering/Public Works

Date: August 23rd, 2016

Reference: Discussion Concerning Drainage Associated with Development North of Sandy Lake and West of Coppel Road (Prologis)

2030: Sustainable City Government
Excellent and Well-Maintained City Infrastructure and Facilities

General Information:

- Discussion will cover all development that has taken place in this drainage basin.
- Information will be provided on what the Engineering Department reviews prior to accepting a drainage design for development.
- All developments calculated similar drainage runoff, since the initial 1997 development.

Introduction:

In 1991, the City Council approved the Storm Water Management Study (1991 Study). This study was a comprehensive evaluation of existing drainage problems and a look ahead on how to address future flooding in the City. The study was a follow-up to flooding that took place in Coppel in 1989. During the course of performing the study, flooding again hit this area in 1990. To prepare for future development, the City needed a way to anticipate what future drainage would be. In the early 90's a large part of west Coppel was vacant land (see attached street map from 1987).

Prior to the completion of the 1991 Study, there wasn't a consistent way to anticipate what future runoff from property would be. Coppel joined the FEMA program in 1975 and the first maps for Coppel were published in 1980. Those maps showed what property could be impacted by runoff during a 100-year storm. The only problem with the FEMA maps is that they are based on existing conditions. To accurately anticipate future runoff, you need to calculate drainage runoff assuming that all the land in the drainage basin has been developed based on its proposed future use. The 1991 Study is based on the ultimate developed conditions. This means that all property was analyzed based

on its future use not its undeveloped status. While the FEMA maps provide a drainage runoff based on a static point in time, the 1991 Study provides a runoff based on fully developed land in the future. What does this mean? It means that if you are one of the first properties that develop in a drainage basin you are required to design your drainage facilities based on what the drainage runoff will be in the future once all the upstream land is developed. In essence, a development may be on the ground for years before the upstream area develops. During this time, they may have very little runoff going through their drainage systems. As the upstream properties develop the runoff increases, however, the systems were designed to handle the increase.

Analysis:

The analysis of the drainage basin involved reviewing each development to determine if they accurately anticipated future runoff from upstream development. The first development was Asbury Manor Subdivision in 1997. On sheet 6 of their plans, a note was added that states “Q100 = 1500 cfs as stated in the City of Coppell Ultimate Development Storm Management Study”. To verify this number, I reviewed the 1991 Study. Plate 4-5 and Plate 5-13 of the 1991 Study show cross section 32+50 at Coppell Road upstream of Asbury Manor. Sheet E-30 of the 1991 Study shows a Q100 at cross section 32+50 of 1500 cfs. So while there was no upstream development in 1997, Asbury Manor was already planning for the ultimate runoff.

The next development was Mansions by the Lake in 1998. This development is north of Asbury Manor. Sheet 6 of Mansions by the Lake Phase II shows a Q100 entering their site from Asbury Manor of 1600 cfs. Again, this is consistent with all information in the 1991 Study which shows a Q100 of 1600 cfs at cross section 21+12, which is generally at the north property line of Asbury Manor. So while no upstream development had yet occurred, both developments were designed for the future conditions.

The next construction was Coppell Road in 2002. Sheet 6 of the Paving and Drainage Improvements for Coppell Road shows a Q100 at Coppell Road of 1750 cfs. The drainage design for Coppell Road was the first time since 1991 that a design engineer had provided an addition study of the upstream runoff.

The next construction was North Freeport Parkway in 2015. Sheet 47 of the plans show a Q100 at Coppell Road of 1700 cfs. Again, this is generally consistent with the anticipated drainage from the 1991 Study.

The most recent development is Prologis in 2016. Sheet C3.08 of the plans show a Q100 of 1497 cfs at Coppell Road. Again, this is generally consistent with the 1991 Study and every calculation over the prior 25 years.

The above information is provided to show that developments in Coppell are designed based on future conditions and that over time downstream properties will see an increase in the amount of runoff through their property as vacant upstream land develops. Staff will provide additional information at the Work Session.

Legal Review: n/a

Fiscal Impact: n/a

Recommendation:

This is information only; no action is requested from Council.