ATTACHMENT J

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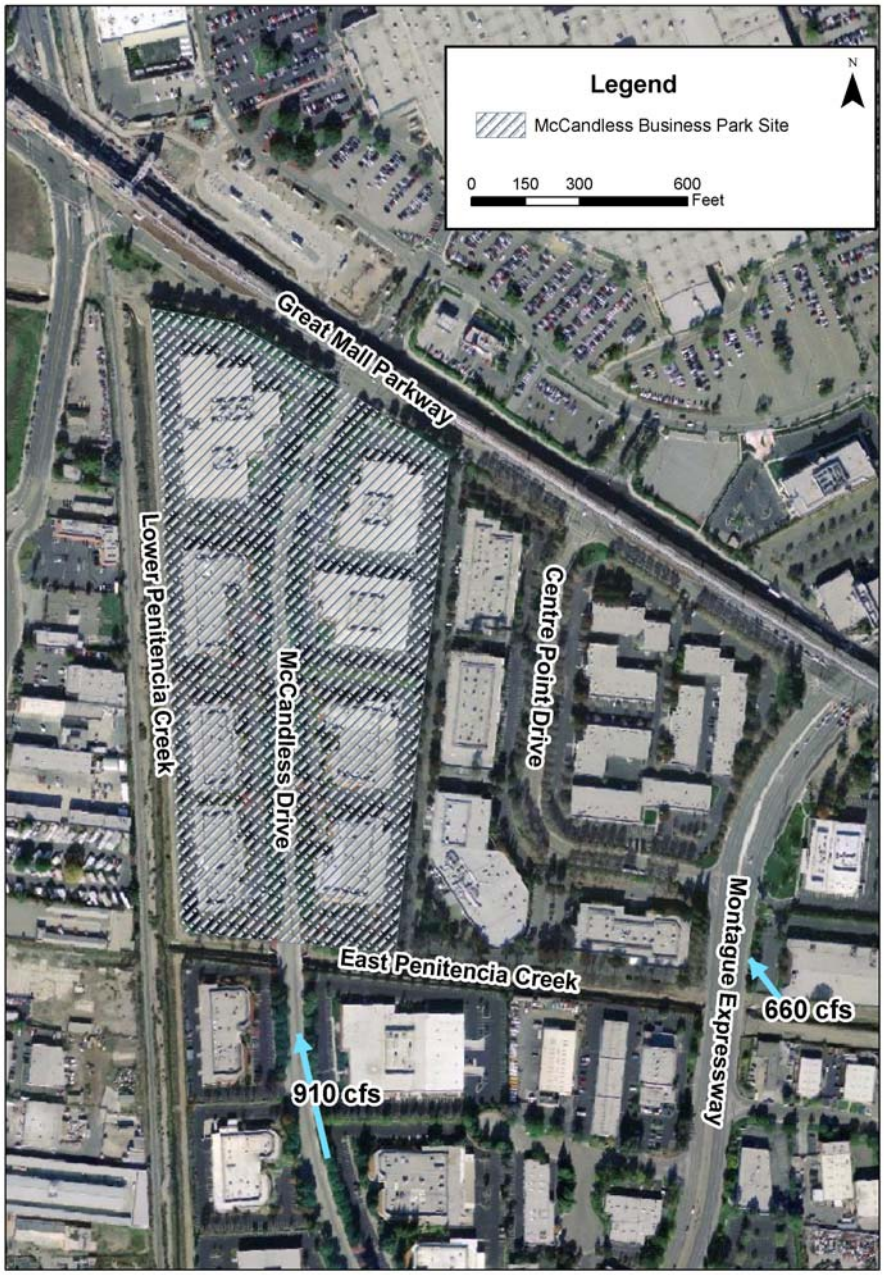
REVISED MEMO

TO:	Glenn Brown, Integral Partners Jorge Duran, RJA	DATE:	October 21, 2011
FROM:	M. Eliza McNulty, PE Caitlin Gilmore, PE	JOB #:	IPLX.03.11
SUBJECT:	McCandless Business Park, 100-year Storm Impacts		

Schaaf & Wheeler has been working with Integral Communities in the analysis of the 100-year hydraulic conditions at the McCandless Business Park (Site) in Milpitas, California. The Site is bounded by East Penitencia Creek to the South, Lower Penitencia Creek to the west, and Great Mall Parkway to the North. McCandless Drive bisects the property into an eastern and western half (see Figure 1). Currently, the Site is entirely developed as commercial (i.e. office buildings). The McCandless project proposes to develop the approximately 26 acre Site into high density residential land use.

Previously, in September of 2008, Schaaf & Wheeler completed a memorandum detailing the results of the hydraulic analysis through the project Site. Since that time, the Site grading and layout has changed. This memorandum presents the results of the updated hydraulic analysis which reflects the updated site plan.

Figure 1: Site Area



During a 100-year storm event, water approaches the Site from the south and east sides. From the east, 660 cfs flows westerly through the Site as a result of a spill from East Penitencia Creek at Montague Expressway. From the south, approximately 910 cubic feet per second (cfs) approaches the site as the result of spilling from Lower Penitencia Creek (see Schaaf & Wheeler Memo, June 22, 2006). FEMA profiles show a water surface elevation (WSEL) of 33' (NGVD) in Lower Penitencia Creek between East Penitencia Creek and the culvert at the downstream limit of the Site (under Southern Pacific Railroad). Schaaf & Wheeler has independently analyzed the weir flow at this downstream limit and found a WSEL of 33.2' NGVD is necessary to convey the peak flow downstream. Thus, 33.2' NGVD was used as the existing 100-year WSEL in Lower Penitencia Creek for this analysis.

In existing conditions there are two paths conveying flows north and south (McCandless Drive and parking lots between existing buildings), three potential western paths in the eastern half of the Site, and three potential paths in the western half of the Site. In the updated proposed condition, the flow paths have been maintained, although their exact locations somewhat shifted. Schaaf & Wheeler created nodes between each of the flow paths, and at high points along the flow paths, where applicable. The site grading and proposed street cross sections were provided to Schaaf & Wheeler by Ruggeri-Jensen-Azar & Associates (RJA). The street cross section and grading plans are dated October 14, 2011. The hydraulic analysis utilizes the minimum street width provided in these plans to calculate the flows along the paths.

The WSEL at each node is calculated for the existing and post project conditions. The flow paths were assigned a Manning's "n" value of 0.025. It was assumed that the flow may overtop sidewalk gutters and the sloping approaches to buildings are utilized for flood conveyance. Given the "n" value used for this width, it is therefore assumed that there are no obstructions to flow in these paths. One example of a common flow obstruction which must be avoided for this analysis to be accurate is a raised planter bed. Manning's equation was used to calculate the slope of the hydraulic grade line between each node, and an iterative process used to balance the flows passing through the Site.

Table 1 and Figures 2 through 4 show the results of this analysis.

Table 1: Existing and Post-Project Hydraulic Conditions

Node	Existing WSEL (NGVD)	Post Project WSEL (NGVD)	Impact (feet)
G	33.6	33.5	-0.1
I	34.1	33.6	-0.5
J	34.2	34.1	0.0
L	33.9	33.9	0.0
M	33.9	34.0	+0.1
N	34.6	34.2	-0.3
O	34.6	34.2	-0.4
P	34.7	34.8	0.0
R	35.3	35.4	+0.1
S	35.6	35.7	+0.1
U	33.9	33.6	-0.4

* Indicates Ground Elevation, No Flow Reaches Node

The existing conditions are unchanged from the previous, September 2008 analysis. In general, the updated plan creates lower post project water surface elevations (by up to 0.5 foot) compared to the September 2008 plan, although some nodes did see a slight increase (up to 0.1 foot) in WSELs due to the Site plan updates. As shown in Table 1, the updated Site plan impacts to existing hydraulic grade lines for the 100-year event do not exceed 0.1 foot, and are lower than existing conditions in several locations. The City of Milpitas requires that the finished floor of each proposed building be placed at least one foot above the predicted 100-year water surface elevation.

Figure 2: Existing Conditions

Figure 3: Post Project Conditions

Figure 4: 100-Year Hydraulic Impacts

Cumulative Impacts

As described above, the weir flow at the downstream limit of the Project Site was calculated to determine the starting WSEL necessary to convey the peak flow downstream. No known projects have been proposed downstream of the Integral Site at the time of this analysis. The Trumark at Trade Zone project is upstream (southeast) of the proposed Integral Site. The Berg Properties Site is also located upstream of the Integral Site, directly south of East Penitencia Creek. Our current understanding is that the both of these upstream projects proposed to grade the sites such that existing flow conditions are mimicked. As shown above, the Integral project has no hydraulic impacts on its southern boundary (nodes J and P). Given these conditions, the Integral, Trade Zone and Berg projects do not adversely impact each other.

The recently constructed Centria Project is located downstream of the Integral Properties site, just north of Lower Penitencia Creek after it crosses the SPRR. As described above, a hydraulic analysis by Schaaf & Wheeler concluded that the 100-year WSEL at the SPRR is 33.2 feet (NGVD). No detailed flood study is available for the Centria Site, however a review of the CLOMR for the project reveals base flood elevations for the 100-year event ranging from 26.0 - 32.0 feet (NGVD). These values are significantly lower than that established at the downstream limit of the Integral analysis by the detailed hydraulic analysis. As such, the available data regarding the Centria project does not impact the hydraulic analysis or findings for the Integral site.

The Montague/Piper TASP sub-district and BART projects are located due east of the Integral project. Given the flow paths in the area, and the location of the Integral project relative to the BART/Montague/Piper sites, the BART/Montague/Piper sites are hydraulically upstream of the Integral project. As such, the hydraulic impacts of the BART/Montague/Piper projects will not impact the Berg project. As shown in Figure 4, the Integral project results in raising BFEs at the eastern limit of the analysis by 0.1 foot. If relevant (see below), the BART analysis should consider the results of this study to establish hydraulic boundary conditions.

The BART Milpitas Station project is located East of the Integral Site and north of East Penitencia Creek. The Floodplain Re-Evaluation Study completed by VTA/BART in April 2010 concludes that flooding from Upper Penitencia Creek does not travel to the Milpitas Station site. Base flood elevations for the study are based on localized runoff and spills from Berryessa Creek alone. If this is indeed the case, the flood risk at the Integral Site is less severe than predicted by FEMA. BART/VTA is currently in the process of preparing a CLOMR application which, based on our review of their current report, will result in a FIRM which shows a decreased flood risk at the Integral Properties Site compared to the effective FIRM. Upstream impacts from development of the BART Milpitas Station site are currently reported to be less than 1 foot. Based on the VTA/BART report in hand and presuming that BART is held to the same standards as other developments and are not allowed to significantly redirect flows or increase the base flood elevation more than 0.1 feet; there will be no increase in flooding risk at the Integral Site due to the BART/VTA project.

According to the BART/VTA April 2010 report, the SCVWD has flood control projects planned for Berryessa and Upper Penitencia Creeks. These projects are planned for the future (years

2015-2023), but will result in maintaining flooding in the channels, thereby further reducing flooding risk at the Integral Site.

The VTA East Penitencia Siphon project at Lundy/Trimble Memorandum by the VTA dated August 2010 proposes to enlarge the existing siphon beneath the Silicon Valley Rapid Transit (SVRT) to create a gravity structure which flows to East Penitencia Creek. The project also proposes to enlarge East Penitencia Channel in order to maintain more flow within the channel. We presume that the channel would be enlarged such that, at a minimum, the existing overland flows would be maintained. It is likely that a channel project of this magnitude would actually decrease the existing overland flooding, however the August 2010 memorandum does not provide sufficient detail to explicitly make this conclusion. Given the numerous downstream capacity restraints along Lower Penitencia Creek, we anticipate that the City will require a detailed hydraulic analysis studying the downstream impacts of the proposed VTA siphon. Again assuming that the project would be held to the same standard and not per permitted to increase overland flooding, this project will have no adverse impacts (and may result in a decreased flood risk) to the Integral Site.

In summary, incorporating BFEs of the project downstream of the proposed Integral Site would represent a less conservative approach than the one taken herein. Upstream projects can impact the Integral site only by significantly altering the existing hydrologic (i.e. flow path) conditions. While the VTA East Penitencia Siphon project proposes to do exactly that, the memorandum also acknowledges that channel improvements to mitigate this increased flow in East Penitencia are required. Based on a review of the information currently available, the end result of the upstream projects currently underway will be a decrease in the anticipated flood risk at the Integral Property.

Conclusion

As shown and described above, the project results in up to 0.1 foot increase in 100-year water surface elevations. At some locations in and adjacent to the Site, 100-year water surface elevations are decreased from 0.1 to 0.5 foot.

Post project WSELs along the eastern boundary of the Site are lower than those on Centre Point Drive. Based on the topography provided, it appears that the ground near the western side of the structures on Centre Point Drive (i.e. along the eastern edge of the Site) is generally above the post project WSELs. Those spot elevations that are below the post project WSELs are also generally below the existing conditions WSELs.