

THOUVENOT, WADE & MOERCHEN, INC.



CIVIL ENGINEERING

GEOSPATIAL SERVICES

STRUCTURAL ENGINEERING

LAND SURVEYING

MUNICIPAL PLANNING



Old Collinsville Road Multi-Use Trail Extension

- Will add 2+ miles of new trails in Swansea
- Will connect neighborhoods to Metro Transit bus stop and dedicated trail access to MetroLink light rail station
- Creates greater public transit access to larger St. Louis Metropolitan area
- New pedestrian bridge will cross Richland Creek



PROJECT BACKGROUND

PERMITTING REQUIREMENTS

DESIGN METHODOLOGY



Pedestrian Bridge

- Located next to existing vehicular bridge
- Tributary drainage area = 11 sq. mi.
- >1 sq. mi. and required IDNR OWR approval
- Located in Zone AE floodplain for Richland Creek



PROJECT BACKGROUND

PERMITTING REQUIREMENTS

DESIGN METHODOLOGY



Richland Creek

- One of County's major waterways
- 140 sq. mi. tributary area
- Confluence with Prairie Du Long Creek before draining to Kaskaskia River
- One active stream gage
- 1957 flood largest on record



PROJECT BACKGROUND

PERMITTING REQUIREMENTS

DESIGN METHODOLOGY



St. Clair County Flood Insurance Study

- Effective as of 2003
- H&H analysis for Swansea were prepared in 1981
- Preliminary maps created in 2008 but never made effective
 - Richland Creek was restudied





PROJECT BACKGROUND

PERMITTING REQUIREMENTS

DESIGN METHODOLOGY



EXCEPTIONAL SERVICE. NOTHING LESS.



PROJECT BACKGROUND

PERMITTING REQUIREMENTS

DESIGN METHODOLOGY



No-Rise Analysis



• Illinois Administrative Code requires <0.1' increase of high-water elevation



PROJECT BACKGROUND

PERMITTING REQUIREMENTS

DESIGN METHODOLOGY



Illinois Joint Permit

PROJECT

BACKGROUND

- Required hydraulic analysis to be reviewed by IDNR Office of Water Resources
- Typical of all projects with >1 sq. mi. of tributary drainage area
- Flow values are typically determined from effective County Flood Insurance Study or USGS *StreamStats* calculations.

Rainfall Event	Q _{FIS,Effective} (cfs)	Q _{StreamStats} (cfs)	Q _{FIS,Prelim-2006} (cfs)	
10-Year	5,000	1,970	2,057	
50-Year	7,200	3,200	4,132	
100-Year	8,200	3,760	5,145	
500-Year	9,900	5,140	6,479	

FUTURE DESIGN

CONSIDERATIONS

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

PERMITTING

REQUIREMENTS

Statistic	Value	Unit
2 Year Peak Flood	793	ft^3/s
5 Year Peak Flood	1470	ft^3/s
10 Year Peak Flood	1970	ft^3/s
25 Year Peak Flood	2660	ft^3/s
50 Year Peak Flood	3200	ft^3/s
100 Year Peak Flood	3760	ft^3/s
500 Year Peak Flood	5140	ft^3/s

DESIGN

METHODOLOGY



Hydraulic Analysis



PROJECT BACKGROUND

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Hydrologic Analysis

- Original submittal used *StreamStats*
- After initial review, FIS values were requested
 - Created adverse flow conditions
- After discussion with IDNR, hydrologic values were calculated with *HEC-HMS*



Rainfall Event	Q _{FIS,Effective} (cfs)			Q _{HEC-HMS} (cfs)
10-Year	5,000	1,970	2,057	2,291
50-Year	7,200	3,200	4,132	3,602
100-Year	8,200	3,760	5,145	5,658
500-Year	9,900	5,140	6,479	-

PROJECT BACKGROUND

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Hydrologic Analysis

- Sub-basins delineated from LiDAR
- Land uses per aerial imagery
- USGS guidance used for time of concentration calculations
- Peak flow rate and hydrograph generated at project location

REQUIREMENTS



METHODOLOGY

CONSIDERATIONS





Revised Hydraulic Analysis

- Verified no-rise conditions
- Satisfied outstanding comments from IDNR
- Received IDNR approval
- Project has been bid and awarded
- Other portions of path are under construction



PROJECT BACKGROUND

PERMITTING REQUIREMENTS

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EXCEPTIONAL SERVICE. NOTHING LESS.

St. Clair County Development

- Sprawl has pushed development closer to floodplains
- Maps not making use of LiDAR
- Redevelopment of older structures near creek channels and waterways
- Minimal digital information available in project planning phases



PROJECT BACKGROUND

PERMITTING REQUIREMENTS

DESIGN METHODOLOGY



Adoption of New FIRMs

• illinoisfloodmaps.org shows St. Louis Metro-East is in process of developing DFIRMs



PROJECT BACKGROUND PERMITTING REQUIREMENTS DESIGN METHODOLOGY





EXCEPTIONAL SERVICE. NOTHING LESS.

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QUESTIONS?

//www.bnd.com/living/article17686400.html