WE HEAR YOU!
THE CITY OF FORT WORTH STORMWATER DIVISION ADDRESSES DEVELOPMENT REVIEW CONCERNS

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Kelly Dillard, P.E., CFM, FNI
Erika Nordstrom, P.E., FNI
History of CFW Design Standards

• **Fundamental Precept**
  
  “No person may divert or impound the natural flow of surface waters in this state....in a manner that damages the property of another....”
  
  (Texas Water Code section 11.086)
  
  — *Balancing acceptable risk and facilitating development*
  
  — *“Simple and Safe”*

• **Pre-Stormwater Utility**
  
  — Drainage design manual
  
  — No staff dedicated to review of new development = limited oversight

• **Stormwater utility establishment (2006)**
  
  — Guiding principle: “stop making things worse”
  
  — First edition of *integrated* Stormwater Management (iSWM) manual
  
  — 1 dedicated staff position
History of CFW Design Standards

• 2006 – 2008
  – Development is slow
  – Staff learning how to interpret and apply standards
  – Complaints are few

• 2009 - 2011
  – Development begins picking up
  – Review of drainage design and application of design standards becomes more thorough
  – Complaints become increasingly frequent

• 2012
  – Add an additional staff member
  – Begin using a 3rd party consultant to augment review staff
  – Grading permit implemented
  – Meetings to discuss standards and interpretations become much more frequent
  – Complaints still frequent
CFW Action Taken

2013

- Launched initiative to evaluate design standards and review process and philosophy
- Freese and Nichols Inc. (FNI) selected to guide the initiative
- Initiative to include benchmarking study and community input
- Development Advisory Committee (DAC) established Stakeholder Steering Committee to work closely with staff and FNI
- Recommendations for Rollout by August – September 2013
- Public Rollout – October 2013
- Begin implementation of changes to standards and processes following deployment
Obtain a comprehensive understanding of the problem

- Stakeholder Steering Committee
- Data Collection
- Root Cause Analysis
- Recommendations
- PDCA

FNI Approach

FNI Work Begins May 2013
Data Collection May – July 2013
Root Cause Analysis August 2013
Recommendations September 2013
Public Rollout October 2013
Stakeholder Steering Committee

- Comprised of members of the Development Advisory Committee (DAC)
  - Engineers
  - Developers
  - Surveyors
  - City Stakeholders

- Helped guide the process and provide valuable input which was incorporated into the final recommendations

FNI Work Begins May 2013

Data Collection May – July 2013

Root Cause Analysis August 2013

Recommendations September 2013

Public Rollout October 2013
Data Collection

• Stakeholder Steering Committee Input
  – DAC Interaction

• City of Fort Worth Staff Interviews
  – Review Staff
  – Internal Departments

• Stakeholder Input
  – Tabletop Interviews
  – Online Survey

• Benchmark Interviews with Five Selected Cities

FNI Work Begins
May 2013

Data Collection
May – July 2013

Root Cause Analysis
August 2013

Recommendations
September 2013

Public Rollout
October 2013
Root Cause Analysis

- Data collected compiled and analyzed using a DMAIC (Define, Measure, Analyze, Improve, and Control) Analysis Process

- Tabletop Interview Data
  - Pareto Charts

- Online Survey Data
  - Pie Charts

- Root Causes
  - Fishbone Diagram

FNI Work Begins May 2013
Data Collection May – July 2013
Root Cause Analysis August 2013
Recommendations September 2013
Public Rollout October 2013
Root Cause Analysis – Pareto Chart

Major Topics

- Customer Service: 80% of responses
- Technical Standards: 20% of responses
- Other: 0% of responses

Timeline:
- FNI Work Begins: May 2013
- Data Collection: May – July 2013
- Root Cause Analysis: August 2013
- Recommendations: September 2013
- Public Rollout: October 2013
Root Cause Analysis – Determination of Root Causes

Customer Service

Confusion with Development Process
- Multiple groups/departments involved in review process
- Department Disagreement
- Not one point of contact
- Multiple groups/departments involved in review process
- Submits to multiple departments
- No work flow/development flowchart

Unpredictable Review Process
- Department Overlap
- Review comments unclear & not documented on-time
- Review comments change on next level of review
- No one place to submit
- Multiple groups/departments involved in review process
- Submits to multiple departments
- Not one point of contact

Root Cause Analysis
- August 2013
- Data Collection
- May – July 2013
- Recommendations
- September 2013
- Public Rollout
- October 2013

Technical Standards

Inconsistent/Inflexible Application of Standards to Previously Approved Projects
- No flexibility in application of standards for redevelopment
- No Authority to Make Decision
- Technical Experience of Reviewer
- Changes in the Design Criteria, including changes to C-Factors, occurred in 2012

Inappropriate Standards Applied to Redevelopment
- Standards developed for greenfield developments
- Inconsistent definitions of Zone of Influence, Adequate Outfall, and Design Storms

Inconsistent Requirements for Downstream Assessments
- No defined rule for downstream assessments
- Interpretation of Standards
- Inconsistent definitions of Zone of Influence, Adequate Outfall, and Design Storms

Poor Communication
- Technical Experience of Reviewer
- Lack of authority to vary from standards
- No customer service training
- Excessive Workload
- Under-staffed

Inadequate Project Based Decisions
- Technical Experience of Reviewer
- Lack of authority to vary from standards
- No customer service training
- Excessive Workload
- Under-staffed

Undefined Status
- Inadequate Project Based Decisions
- Technical Experience of Reviewer
- Lack of authority to vary from standards
- No customer service training
- Excessive Workload
- Under-staffed

No Response
Recommendations – Identified Major Concerns

• Customer Service
  – Reviews Too Long
  – Inadequate Communication
  – Lack of Predictability
  – Lack of Flexibility

• Technical Standards
  – Level of detail required
  – Downstream assessments
  – Re-development/Infill Requirements
  – Application of current standards to developments with phases approved based on older standards

FNI Work Begins May 2013
Data Collection May – July 2013
Root Cause Analysis August 2013
Recommendations September 2013
Public Rollout October 2013
Recommendations – 2013

1. Organize for Success

2. Improve Development Review Process

3. Revise Technical Criteria

4. Provide Options for Infill and Regional Alternatives

5. Training and Education

- FNI Work Begins May 2013
- Data Collection May – July 2013
- Root Cause Analysis August 2013
- Recommendations September 2013
- Public Rollout October 2013
Implemented Performance Measures

**Stormwater Development Review Team**

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn around time of Drainage Reviews</td>
<td>10 Business Days</td>
</tr>
<tr>
<td>Number of Drainage Reviews per Submittal</td>
<td>3 reviews (avg)</td>
</tr>
<tr>
<td>Timeliness of Response to Emails and Phone Calls</td>
<td>1 business day (max)</td>
</tr>
<tr>
<td>Customer Service Training</td>
<td>Set on Individual Employee Goals</td>
</tr>
<tr>
<td>Average Rating on Internal &amp; External Surveys</td>
<td>TBD based on survey development</td>
</tr>
</tbody>
</table>
PDCA – Action Taken

• 2014 - Present

  – Key stakeholders brought concerns to ACM and City Council
  – Re-evaluation of processes indicated validity of concerns
  – Re-organization of staff to address process concerns
  – Re-evaluation of drainage criteria manual to investigate and implement reduced level of detail and stringency
  – Stakeholder survey to provide quantitative feedback on implemented changes
  – Quarterly meetings with Stormwater Liaison Committee
Re-Organization of Staff

Assistant Director
Stormwater Management Division

Stormwater Development Services Manager

Stormwater Development Services Operations Manager

- City Stormwater Development Review Engineers (3)
- Stormwater Development Services Coordinator
- 3rd Party Review Consultants

Kiran Konduru, P.E., Mathew Williamson, P.E., Stephen Nichols, E.I.T.
Manual Changes for Ease of Use

- Transition from “iSWM Manual” to “iSWM Community”
### City of Fort Worth Evaluation of Stormwater Development Review Policies Recommendations

#### Process Changes

<table>
<thead>
<tr>
<th>No.</th>
<th>Recommended Measure</th>
<th>Focus Area</th>
<th>Addressed*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>Threshold for iSWM Reviews at 1.0 acres</td>
<td>Site Size; Level of Detail</td>
<td>Table 1.1</td>
</tr>
<tr>
<td>P-2</td>
<td>Developing a process to resolve outstanding issues remaining after completion of the 3rd review</td>
<td>Too Many Iterations</td>
<td>Greater communication with applicants</td>
</tr>
<tr>
<td>P-3</td>
<td>Combined/simplified checklists</td>
<td>Level of Detail</td>
<td>Appendix A</td>
</tr>
<tr>
<td>P-4</td>
<td>Previously approved preliminary iSWM plans will remain valid if the engineer of record changes between the preliminary and final iSWM; New engineer of record assumes responsibility for all future submittals and approvals</td>
<td>Preliminary Phase; Undocumented Requirements</td>
<td>Section 1.3</td>
</tr>
<tr>
<td>P-5</td>
<td>Allow new phases of development to use 2006 standards if “dependent” on a previous phase built according to 2006 standards</td>
<td>Level of Detail</td>
<td>Section 1.3, Pg. 1-4 - 1-5; Section 3.3, Pg. 3-5</td>
</tr>
<tr>
<td>P-6</td>
<td>For requests for previously completed studies relating to an application, do not require anything beyond an e-mail to document the Open Records Request</td>
<td>Undocumented Requirements</td>
<td>Process change</td>
</tr>
<tr>
<td>P-7</td>
<td>For changes during IPRC, preliminary iSWM resubmittal not required. Rather, show that all design criteria are still met in final iSWM plan.</td>
<td>Preliminary Phase; Too Many Iterations</td>
<td>Section 2.3, Page 2-6</td>
</tr>
<tr>
<td>P-8</td>
<td>Continue City facilitation of variance requests.</td>
<td>Too Many Iterations</td>
<td>Maintain current process</td>
</tr>
<tr>
<td>P-9</td>
<td>Use a single review letter for the life of the review to document new comments limited to additional detail by applicant - Maintain all comments, identifying &quot;Addressed&quot;, &quot;Not Addressed&quot;, and &quot;New Comment&quot;</td>
<td>Comment Consistency</td>
<td>Comments letters to maintain continuous list</td>
</tr>
<tr>
<td>P-10</td>
<td>Do not require resubmittals for preliminary plat unless changes result in revised offsite discharge condition.</td>
<td>Preliminary Phase</td>
<td>Section 2.3, Step 5</td>
</tr>
<tr>
<td>P-11</td>
<td>Revised IPRC checklists to remove conflicts with drainage criteria requirements</td>
<td>Comment Consistency</td>
<td>Stormwater to correct conflicting IPRC checklist</td>
</tr>
<tr>
<td>P-12</td>
<td>Multiple Stormwater controls may be included in a single SFMA</td>
<td>Undocumented Requirements</td>
<td>Section 3.11, Pg. 3-76</td>
</tr>
<tr>
<td>P-13</td>
<td>SFMA may be waived for areas identified for detention that also serve other purposes for the development (e.g. parking lots, loading docks, etc.)</td>
<td>Undocumented Requirements</td>
<td>Section 3.11, Pg. 3-76</td>
</tr>
<tr>
<td>P-14</td>
<td>No conceptual iSWM review except when required for Concept Plans submitted through Planning and Development</td>
<td>Reduction in Stringency</td>
<td>Section 2.3, Page 2-5</td>
</tr>
</tbody>
</table>

*Planned for implementation June 8, 2015

*References refer to Draft City of Fort Worth Stormwater Criteria Manual dated April 1, 2015
Significant Process Changes

- Streamlined Review Process
  - Threshold
  - Combined Checklists
  - No longer QA/QC

- Resubmittal Requirements
  - Engineer of Record
  - IPRC/Platting
  - Previously Approved Studies

- Communication Efficiency

- Facility Maintenance Agreements
<table>
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<tr>
<th>No.</th>
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<tr>
<td>T-1</td>
<td>Simplified methods for determining downstream impacts</td>
<td>Level of Detail; Preliminary Phase</td>
<td>TBI</td>
</tr>
<tr>
<td>T-2</td>
<td>Simplified methods for estimating preliminary detention volumes</td>
<td>Level of Detail; Preliminary Phase</td>
<td>TBI</td>
</tr>
<tr>
<td>T-3</td>
<td>Existing upstream detention facilities may be considered in determination of design flows for a proposed development.</td>
<td>Undocumented Requirements</td>
<td>Section 3.3</td>
</tr>
<tr>
<td>T-4</td>
<td>Channel velocities may be increased up to the maximum permissible velocities provided in Table 3.15 and 3.16. If existing velocities exceed the permissible maximum velocity for the channel, no more than a 5% increase is allowed.</td>
<td>Reduction in Stringency</td>
<td>Table 3.1; Table 3.15 and 3.16</td>
</tr>
<tr>
<td>T-5</td>
<td>Max allowable velocity in storm drain mains = 20 fps</td>
<td>Reduction in Stringency</td>
<td>Table 3.8, Pg. 3-28</td>
</tr>
<tr>
<td>T-6</td>
<td>Detention basin return events for design are 1, 5 and 100 yr storm</td>
<td>Comment Consistency</td>
<td>Pg. 3-51</td>
</tr>
<tr>
<td>T-7</td>
<td>Drainage easements include a 10-foot buffer on one side only</td>
<td>Reduction in Stringency</td>
<td>Pg. 3-73</td>
</tr>
<tr>
<td>T-8</td>
<td>Remove requirement for continuous access easement around detention basins. One single point of entrance for maintenance equipment is acceptable.</td>
<td>Undocumented Requirements</td>
<td>Section 3.11, Pg. 3-74</td>
</tr>
<tr>
<td>T-9</td>
<td>Roadside ditches do not require a HEC-RAS analysis for discharges less than 10 cfs, when in normal depth flow.</td>
<td>Reduction in Stringency</td>
<td>Pg. 3-43</td>
</tr>
<tr>
<td>T-10</td>
<td>No increase greater than 0.1 feet in 1-, 5-, and 100-year flood elevations over existing roadways. No increase greater than 0.1 feet in 100-year flood elevations, unless contained in existing channel, roadway, drainage easement and/or R.O.W.</td>
<td>Reduction in Stringency</td>
<td>Table 3.1</td>
</tr>
<tr>
<td>T-11</td>
<td>Waive DS assessment for projects with less than 5 acres of land disturbance or a contributing drainage area of less than 25 acres at the outlet when detention is proposed to fully mitigate increased peak discharge.</td>
<td>Site Size; Infill</td>
<td>Table 3.1, Pg. 3-2; Table 3.2, Pg. 3-3</td>
</tr>
<tr>
<td>T-12</td>
<td>New Flood Mitigation Option 4: When downstream impacts are limited to a single adjacent property, the developer may obtain a written letter of permission acknowledging the impacts from the affected property owner in lieu of mitigation.</td>
<td>Undocumented Requirements</td>
<td>Table 3.2, Pg. 3-3</td>
</tr>
<tr>
<td>T-13</td>
<td>Prelim iSWM reviews will focus on water flowing to and from the site and will only include enough detail to approximate onsite controls, adequate downstream capacity, and general volume and location of detention to support full development of the project.</td>
<td>Preliminary Phase; Too Many Iterations</td>
<td>Section 2.2, Pg. 2-1</td>
</tr>
<tr>
<td>T-14</td>
<td>Modified rational method can be used for planning and conceptual design up to 200 acres and final design limited to 25 acres.</td>
<td>Conflicting Requirements</td>
<td>Section 3.8.4, Pg. 3-52</td>
</tr>
</tbody>
</table>

Planned for implementation June 8, 2015

*References refer to Draft City of Fort Worth Stormwater Criteria Manual dated April 1, 2015
Significant Technical Changes

- Reduced Level of Detail at Preliminary iSWM Phase
- Downstream Assessments
- Detention
- Miscellaneous Design Changes
Summary

- Balancing acceptable risk and facilitating development
  - “Simple and Safe”
- Stakeholder communication foundational to success
- Organizational structure and culture
- Data analysis techniques beneficial to validate root causes and recommendations
- **PDCA critical!**
- Re-evaluation resulted in currently implemented processes receiving positive feedback from development community