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)

- **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 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
- 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

FNI Approach

Obtain a comprehensive understanding of the problem
- Stakeholder Steering Committee
- Data Collection
- Root Cause Analysis
- Recommendations
- Public Rollout

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
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
Interviews June - July 2013
Online Survey June - July 2013
Root Cause Analysis August 2013
Recommendations September 2013
Public Rollout October 2013

Data Collection

City Staff Interviews

- Stormwater Development Review Staff
  - Internal City Staff
  - 3rd Party Reviewers: Independent Consultants
    - Understand reviewer’s point of view
    - Level of review detail, perceived misunderstandings of standards, identified areas of confusion in manual

- Planning and Development
  - Integration of stormwater reviews in the development process
  - “Middleman” perception

Data Collection

Stakeholder Input

- Invitation sent to developers, engineers, and other stakeholders

- Tabletop Interviews
  - Confidential setting
  - Open format
  - 17 interviews, 31 interviewees

- Online Survey
  - Questions concerning both customer service and technical issues
  - 1-5 Ranking for standard questions
  - Open format
  - 52 participants

FNI Work Begins May 2013
Data Collection May - July 2013
Interviews June - July 2013
Online Survey June - July 2013
Root Cause Analysis August 2013
Recommendations September 2013
Public Rollout October 2013
Data Collection
Benchmark Interviews

- Benchmark interviews with five selected cities chosen and approved by Stakeholder Steering Committee
  - Arlington
  - Charlotte, NC
  - Dallas
  - Kansas City, MO
  - San Antonio

- Standard questions based on process, customer service, and technical standards

- Results:
  - Staffing per review volume, review timeframes and re-review standards
  - Insight into Best Practices

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

Root Cause Analysis – Tabletop Survey

- Open format

- Data was aggregated into major topics
  - Customer Service
    - Customer Interaction
    - Review Process
    - Overall Process Compatibility
  - Technical Standards
  - Other

- Excessive Detail
- Inconsistent or Unclear
- Downstream Assessments
- Grading Permit
- Greenfield vs. Infill

- Customer Service
  - Customer Interaction
    - Communication
      - Lack of Predictability
      - Slow/No Response/Poor
      - Not One Point of Contact
      - Generic Comments
    - Engineering Judgment
      - Lack of Flexibility
      - Lack of Authority for Decisions
      - Inconsistency in Reviews
  - Review Process
    - Review Time Too Long
    - Unknown Timeframe
    - Re-Review Timeframe
    - Submittal at Bottom of Review Stack
  - Overall Process Compatibility
    - Department Overlap and/or Disagreement
    - Lack of Review Concurrence

- Other
  - Previous Approvals
  - Seek Approval Above Reviewer
Root Cause Analysis – Tabletop Survey

Pareto Charts

[Graph showing distribution of customer service, technical standards, and other issues]

FNI Work Begins May 2013
Data Collection May – July 2013
Interviews June – July 2013
Online Survey June – July 2013
Recommendations August 2013
Public Rollout October 2013

80%

Root Cause Analysis

Recommendations

Public Rollout

FNI Work

Begins

May 2013

Data Collection

May – July 2013

Interviews

June – July 2013

Online Survey

June – July 2013

Recommendations

August 2013

Public Rollout

October 2013

80%
Root Cause Analysis – Tabletop Survey

Pareto Charts

Customer Service

Customer Interaction

Communication

- Lack of Predictability
- Slow/No Response
- Not One Point of Contact
- Generic Comments

- 80%
- 80%
- 80%
- 80%

- 12
- 15
- 6
- 0

- 0%
- 20%
- 40%
- 60%
- 80%
- 100%

Review Time Too Long

- 3
- 9
- 0

- 0%
- 20%
- 40%
- 60%
- 80%
- 100%

Other

- 1. Previous Approvals
- 2. Seek Approval Above Reviewer

- 6/9/2014
Root Cause Analysis – Tabletop Survey

Pareto Charts

Customer Service
- Overall Process Compatibility
- Lack of Flexibility
- Inconsistency in Reviews
- Engineering Judgment
- Generic Comments
- Not One Point of Contact
- Slow/No Response/Poor
- Lack of Predictability
- Communication

Technical Standards
- Excessive Detail
- Inconsistent or Unclear
- Downstream Assessments
- Overall Process Compatibility
- Customer Service
- Grading Permit
- Greenfield vs. Infill

Other
- Previous Approvals
- Seek Approval Above Reviewer
- Excessive Detail
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Other
- Previous Approvals
- Seek Approval Above Reviewer
- Excessive Detail
- Inconsistent or Unclear
- Downstream Assessments
- Overall Process Compatibility
- Customer Service
- Grading Permit
- Greenfield vs. Infill
Root Cause Analysis – Online Survey

- Data was aggregated into major topics to align with tabletop data
  - General Information
  - Customer Service
  - Technical Standards

- Results Indicated:
  - High familiarity with the iSWM program
  - Participants had a combination of submittals for residential, commercial, and infill developments
  - Customer service concerns were high
  - Technical issues more greatly related to clarity of standards than specific design requirements

Root Cause Analysis – Determination of Root Causes
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

Recommendations

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

Recommendations – Implementation Plan and Status

<table>
<thead>
<tr>
<th>Implementation Plan and Status</th>
<th>Priority</th>
<th>Completion Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organize for Success</td>
<td>Medium</td>
<td>Various Dates</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Improve Development Review Process</td>
<td>Medium</td>
<td>Various Dates</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Revise Technical Criteria</td>
<td>Medium</td>
<td>Various Dates</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Provide Options for Infill and Regional Alternatives</td>
<td>Medium</td>
<td>Various Dates</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Training and Education</td>
<td>Medium</td>
<td>Various Dates</td>
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<td></td>
</tr>
</tbody>
</table>
Where are We Now?

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>

Accomplishments to Date: Documentation Tools

- Standard Review Tracking Log
  - Date Submitted
  - Date of Comments
  - Number of Reviews
  - Date Complete/Approved

- Database Capabilities
  - Custom queries
  - Project/development specific searches
  - Complete tracking of a project through the review process (permits, case numbers, etc.)

Over 553 submittals in the tracking log
Submittal Processing Statistics:
Percent Completed in Less Than 10 Days

Accomplishments to Date:
Improved Development Review Process

<table>
<thead>
<tr>
<th>Implementation Measure</th>
<th>Priority</th>
<th>Completion Schedule</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Flowchart Enhancements</td>
<td>Medium</td>
<td>Fully integrated Oct. 2013</td>
<td></td>
</tr>
<tr>
<td>Documentation Tools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Develop standard review documents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Utilize review tracking log</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online Review Tools</td>
<td>Medium</td>
<td>Dec. 2013</td>
<td>Complete and On-going</td>
</tr>
<tr>
<td>a) Utilize standard online tracking tools</td>
<td></td>
<td></td>
<td>Online submittal process available</td>
</tr>
<tr>
<td>b) Utilize standard electronic review tools</td>
<td></td>
<td></td>
<td>Language currently under review by City</td>
</tr>
<tr>
<td>Applicability of SWM Standards</td>
<td>High</td>
<td>Jan. 2014 (Implemented with SWM Revisions)</td>
<td></td>
</tr>
</tbody>
</table>

Accomplishments to Date:
Enhanced Process Flowchart
Accomplishments to Date:
Documentation Tools

• Standard Review Document
  – Comments provided via email
  – Pertinent files attached to email

Accomplishments to Date:
Online Review Tools

• Online Submittal Process
  – Obtain fillable iSWM Forms/Checklists
  – Compile requisite checklist and digital exhibits
  – Email submittal package (via FTP)
  – Cursory review performed for completeness of the submittal package upon receipt
  – Complete submittal packages then sent to the assigned reviewer

Accomplishments to Date:
Revised Technical Criteria

<table>
<thead>
<tr>
<th>Implementation Measure</th>
<th>Priority</th>
<th>Completion Schedule</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
<td></td>
<td>Effective Date: Jan. 2014</td>
<td></td>
</tr>
<tr>
<td>• Revise Chapter 1 of iSWM Criteria Manual (Policy)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Revise Chapter 2 of iSWM Criteria Manual (Design Criteria)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Revise Chapter 5 of iSWM Criteria Manual (Sample Submittals)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Appendix A – Review Checklists</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Accomplishments to Date:
Clarified iSWM Plan Requirements

Conceptual iSWM Plan:
• Required for concept plans only
• Conceptual drainage area maps and calculations

Preliminary iSWM Plan:
• Required for preliminary plans and preliminary plats ≥ 0.5 acres
• Determine edge conditions (adequate outfall and zone of influence)

Final iSWM Plan:
• Required for final plans, final plats ≥ 0.5 acres, and final construction plans
• Coordinate review with infrastructure plan review

Accomplishments To Date:
Revise Technical Criteria (Underway)

Chapter 1: City of Fort Worth Stormwater Policy
1. COFW SW Policy Statement
2. Adoption of Current Standards
3. Applicability (Requirements based on land disturbance)

Chapter 2: Development Process
1. iSWM Submittals
2. Submittal Requirements
3. Development of an iSWM Plan

Chapter 3: Design Criteria
1. Integration of local provisions into criteria
2. Integration of Chapter 5 into criteria

Chapter 4: Construction Criteria

Chapter 5: Sample Submittals

Appendix A – Detailed Checklists and Forms
1. Revised for consistency with manual

Accomplishments to Date:
Options for Infill and Regional Alternatives

<table>
<thead>
<tr>
<th>Implementation Measure</th>
<th>Priority</th>
<th>Completion Schedule</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Provide Options for Infill and Regional Alternatives</td>
<td>Medium</td>
<td>Summer 2014</td>
<td>Underway:</td>
</tr>
<tr>
<td>a) Redevelopment/Infill</td>
<td></td>
<td></td>
<td>• Underway:</td>
</tr>
<tr>
<td>b) Regional Alternatives</td>
<td></td>
<td></td>
<td>• Maintain or decrease percent impervious cover and not increase downstream impacts, no off-site improvements necessary</td>
</tr>
<tr>
<td>c) Strategically align future City master plans to proven redevelopment areas</td>
<td></td>
<td></td>
<td>• Sub-task force will be created to specifically address infill options and regional alternatives</td>
</tr>
</tbody>
</table>
Accomplishments To Date:
Options for Infill and Regional Alternatives (Study Underway)

Summary

• Organizational Changes
• Implementation of Tracking Database
• Review Completion Timeframes
• Improved Development Review Process
• Technical Manual Update Underway