



# City of Madison

## Proposed Plat & Rezoning

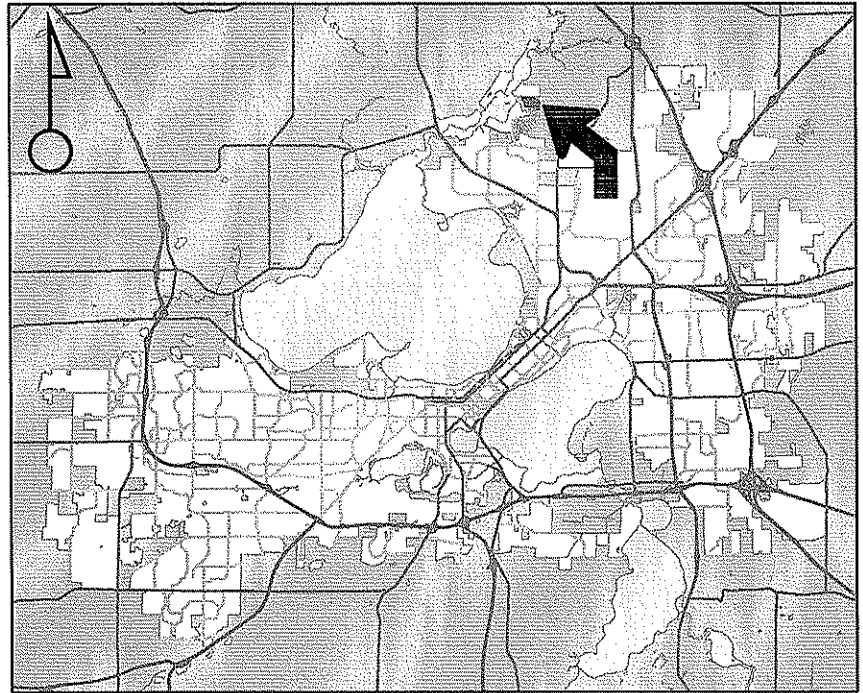
Plat Name  
**Cherokee 5th Addition**  
 Location  
**5898 North Sherman Avenue**  
 Applicant  
**Craig Makela - Cherokee Park, Inc.**

Preliminary       Final

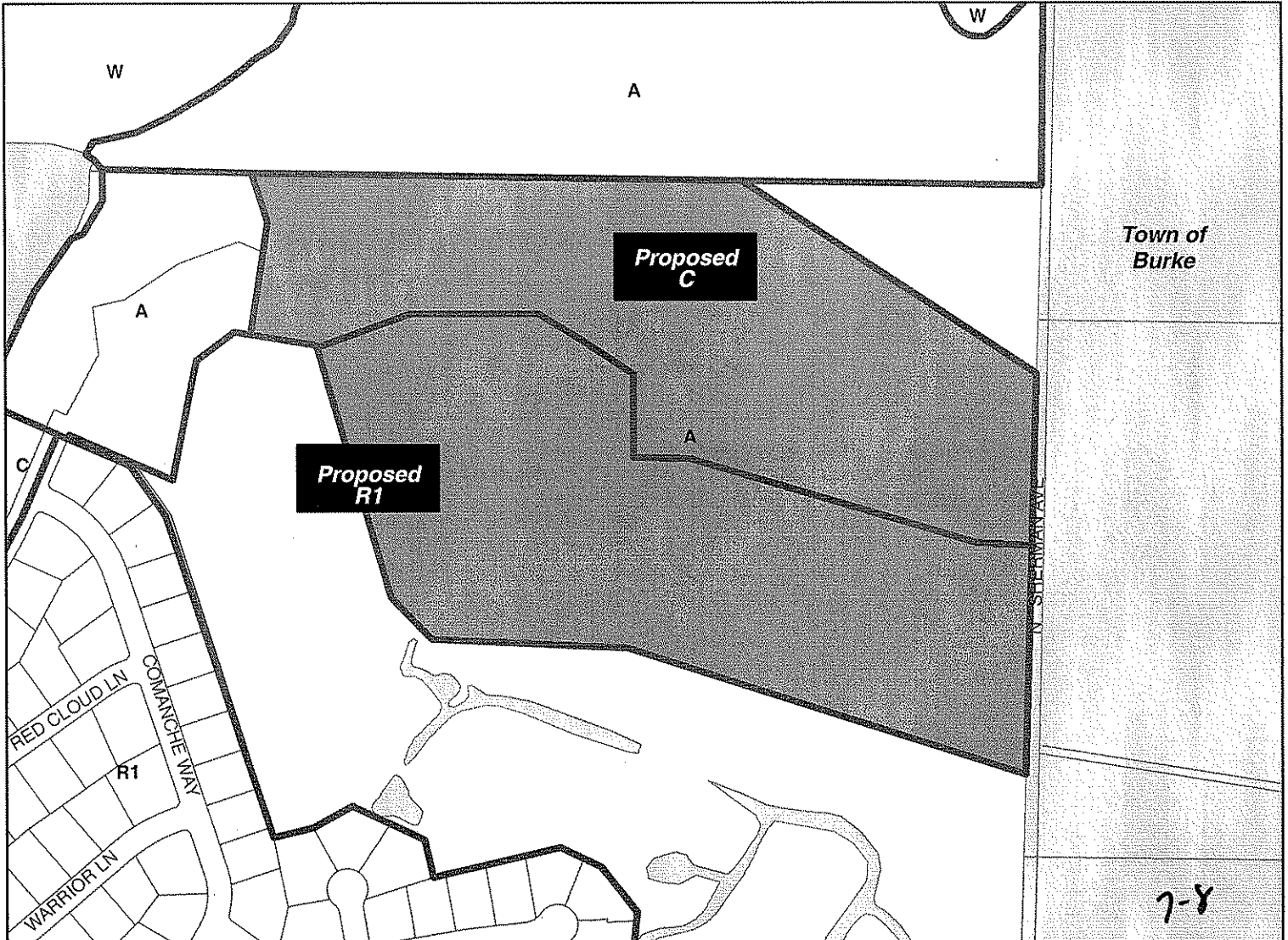
From: **Temp A**      To: **R1 & C**

Proposed Use  
**47 Single-Family Lots & 2 Outlots**

Public Hearing Date  
 Plan Commission  
**05 May 2008**  
 Common Council  
**20 May 2008**



For Questions Contact: Tim Parks at: 261-9632 or [tparks@cityofmadison.com](mailto:tparks@cityofmadison.com) or City Planning at 266-4635



Scale : 1" = 400'

City of Madison, Planning Division : RPJ : Date : 22 April 2008



# LAND USE APPLICATION

## Madison Plan Commission

215 Martin Luther King Jr. Blvd; Room LL-100  
 PO Box 2985; Madison, Wisconsin 53701-2985  
 Phone: 608.266.4635 | Facsimile: 608.267.8739

- The following information is required for all applications for Plan Commission review.
- Please read all pages of the application completely and fill in all required fields.
- This application form may also be completed online at [www.cityofmadison.com/planning/plan.html](http://www.cityofmadison.com/planning/plan.html)
- All zoning application packages should be filed directly with the Zoning Administrator's desk.
- All applications will be reviewed against the applicable standards found in the City Ordinances to determine if the project can be approved.

### FOR OFFICE USE ONLY:

Amt. Paid 2700 - Receipt No. 89246  
 Date Received 3-5-08  
 Received By MWT  
 Parcel No. \_\_\_\_\_  
 Aldermanic District 18 - Michael Schumacher  
 GQ \_\_\_\_\_  
 Zoning District Temp AG  
**For Complete Submittal**  
 Application  Letter of Intent \_\_\_\_\_  
 IDUP  Legal Descript. \_\_\_\_\_  
 Plan Sets  Zoning Text \_\_\_\_\_  
 Alder Notification  Waiver \_\_\_\_\_  
 Ngrbrhd. Assn Not.  Waiver \_\_\_\_\_  
 Date Sign Issued 3-5-08

1. **Project Address:** North Sherman Ave **Project Area in Acres:** 26.0263  
**Project Title (if any):** 5th Addition

2. **This is an application for:** (check at least one)

<input checked="" type="checkbox"/> <b>Zoning Map Amendment</b> (check only ONE box below for rezoning and fill in the blanks accordingly)		
<input checked="" type="checkbox"/> Rezoning from <u>Temp Ag</u> to <u>R1</u>	<input type="checkbox"/> Rezoning from _____ to PUD/PCD-SIP	
<input type="checkbox"/> Rezoning from _____ to PUD/PCD-GDP	<input type="checkbox"/> Rezoning from PUD/PCD-GDP to PUD/PCD-SIP	
<input type="checkbox"/> <b>Conditional Use</b>	<input type="checkbox"/> <b>Demolition Permit</b>	<input type="checkbox"/> <b>Other Requests</b> (Specify): _____

3. **Applicant, Agent & Property Owner Information:**

Applicant's Name: Cherokee Park, Inc Company: \_\_\_\_\_  
 Street Address: 5000 N Sherman Ave City/State: Madison, WI Zip: 53704  
 Telephone: (608) 249-1000 x102 Fax: (608) 241-8909 Email: cmakela@cherokee.countryclub.net

Project Contact Person: Craig Makela Company: CPI  
 Street Address: 5000 N Sherman Ave City/State: Madison WI Zip: 53704  
 Telephone: (608) 249-1000 x102 Fax: (608) 241.8909 Email: cmakela@cherokee.countryclub.net

Property Owner (if not applicant): \_\_\_\_\_  
 Street Address: \_\_\_\_\_ City/State: \_\_\_\_\_ Zip: \_\_\_\_\_

4. **Project Information:**

Provide a general description of the project and all proposed uses of the site: Single family neighborhood development consisting of 47 lots.

Development Schedule: Commencement Fall '08 Completion Fall '15

**5. Required Submittals:**

**Site Plans** submitted as follows below and depicts all lot lines; existing, altered, demolished or proposed buildings; parking areas and driveways; sidewalks; location of any new signs; existing and proposed utility locations; building elevations and floor plans; landscaping, and a development schedule describing pertinent project details:

- **Seven (7) copies** of a full-sized plan set drawn to a scale of one inch equals 20 feet (collated and folded)
- **Seven (7) copies** of the plan set reduced to fit onto 11 inch by 17 inch paper (collated, stapled and folded)
- **One (1) copy** of the plan set reduced to fit onto 8 1/2 inch by 11 inch paper

**Letter of Intent: Twelve (12) copies** describing this application in detail but not limited to, including: existing conditions and uses of the property; development schedule for the project; names of persons involved (contractor, architect, landscaper, business manager, etc.); types of businesses; number of employees; hours of operation; square footage or acreage of the site; number of dwelling units; sale or rental price range for dwelling units; gross square footage of building(s); number of parking stalls, etc.

**Legal Description of Property:** Lot(s) of record or metes and bounds description prepared by a land surveyor.

**Filing Fee:** \$ 2700<sup>00</sup> See the fee schedule on the application cover page. Make checks payable to: *City Treasurer.*

**IN ADDITION, THE FOLLOWING ITEMS MAY ALSO BE REQUIRED WITH YOUR APPLICATION; SEE BELOW:**

For any applications proposing demolition of existing (principal) buildings, photos of the structure(s) to be demolished shall be submitted with your application. Be advised that a *Reuse and Recycling Plan* approved by the City's Recycling Coordinator is required to be approved by the City prior to issuance of wrecking permits.

A project proposing **ten (10) or more dwelling units** may be required to comply with the City's Inclusionary Zoning requirements outlined in Section 28.04 (25) of the Zoning Ordinance. A separate **INCLUSIONARY DWELLING UNIT PLAN** application detailing the project's conformance with these ordinance requirements shall be submitted concurrently with this application form. Note that some IDUP materials will coincide with the above submittal materials.

A *Zoning Text* must accompany **all** Planned Community or Planned Unit Development (PCD/PUD) submittals.

**FOR ALL APPLICATIONS:** All applicants are required to submit copies of all items submitted in hard copy with their application (including this application form, the letter of intent, complete plan sets and elevations, etc.) as **INDIVIDUAL** Adobe Acrobat PDF files compiled either on a non-returnable CD to be included with their application materials, or in an e-mail sent to [pcapplications@cityofmadison.com](mailto:pcapplications@cityofmadison.com). The e-mail shall include the name of the project and applicant. Applicants who are unable to provide the materials electronically should contact the Planning Unit at (608) 266-4635 for assistance.

**6. Applicant Declarations:**

**Conformance with adopted City plans:** Applications shall be in accordance with all adopted City of Madison plans:

→ The site is located within the limits of ~~SAP~~ Cherokee Species Area Plan, which recommends:

Medium Density Residential 1 for this property.

**Pre-application Notification:** Section 28.12 of the Zoning Ordinance requires that the applicant notify the district alder and any nearby neighborhood or business associations by mail no later than **30 days** prior to filing this request:

→ List below the Alderperson, Neighborhood Association(s), Business Association(s) AND dates you sent the notices:

Michael Schumacher, Cherokee Neighborhood Assoc. notice 12/19/07  
If the alder has granted a waiver to this requirement, please attach any such correspondence to this form. meeting 1/27/08

**Pre-application Meeting with staff:** Prior to preparation of this application, the applicant is required to discuss the proposed development and review process with Zoning Counter and Planning Unit staff; note staff persons and date.

Planner \_\_\_\_\_ Date \_\_\_\_\_ | Zoning Staff \_\_\_\_\_ Date \_\_\_\_\_

The signer attests that this form has been completed accurately and all required materials have been submitted:

Printed Name Craig Makela Date 3/5/08  
Signature \_\_\_\_\_ Relation to Property Owner Employee

Authorizing Signature of Property Owner [Signature] Date 3/5-08

Cherokee Park, Inc  
5000 N Sherman Ave  
Madison, WI 53704

February 15, 2008

Madison Plan Commission  
215 Martin Luther King Blvd Rm LL-100  
PO Box 2985  
Madison, WI 53701-2985

Re: Letter of Intent  
Fifth Addition Residential Development  
North Sherman Ave  
Rezoning Application  
Preliminary/Final Plat Application

Owner: Cherokee Park, Inc  
5000 N Sherman Ave  
Madison, WI 53704  
Contact: Craig Makela  
(608) 444-0207  
[cmakela@cherokeecountryclub.net](mailto:cmakela@cherokeecountryclub.net)

Project Manager: Craig Makela  
Cherokee Park, Inc  
5000 N Sherman Ave  
Madison, WI 53704  
(608) 444-0207  
[cmakela@cherokeecountryclub.net](mailto:cmakela@cherokeecountryclub.net)

Land Planner: Schreiber/Anderson Associates, Inc  
Tim Anderson, APA, Principal  
717 John Nolen Drive  
Madison, WI 53713  
(608) 255-0800  
[tanderson@saa-madison.com](mailto:tanderson@saa-madison.com)

Project Engineer: Dan Murray, PE  
Cherokee Park, Inc  
5000 N Sherman Ave  
Madison, WI 53704  
(608) 575-6927  
[dmurray@charter.net](mailto:dmurray@charter.net)

Site Engineer: General Engineering  
Scott Anderson, PE  
916 Silver Lake Drive  
PO Box 340  
Portage, WI 53901  
(608) 742-2169  
[sanderson@generalengineering.net](mailto:sanderson@generalengineering.net)

Storm Water Mgt: Montgomery Associates: Resource Solutions, LLC  
Ann-Marie E Kirsch, PE  
2820 Walton Commons West, Suite 135  
Madison, WI 53718  
(608) 223-9585  
[ann-marie@ma-rs.org](mailto:ann-marie@ma-rs.org)

Surveyor: Birrenkott Surveying, Inc  
Patrick Cowell  
PO Box 237  
1677 N Bristol St  
Sun Prairie, WI 53590  
(608) 837-7463  
[birrenkott@spwl.net](mailto:birrenkott@spwl.net)

**Enclosed Submittals:**

- Preliminary/Final Plat w/Legal Description
- Land Use Application (R1 Zoning Requested)
- Subdivision Application
- Inclusionary Zoning Application/Waiver Request
- Storm Water Management Plan
- Site Plan
- Grading and Drainage Plan
- Utility Plan
- Landscape Plan
- Tree Preservation Plan
- Proposed Public Street Design
- Project Narrative
- General Design Standards

**Not Included as Required:**

- 60 Year Title Report (Under cooperative agreement with City Real Estate Office, the City has ordered this report for upcoming land sale). Please contact Jeff Ekola with questions.

**Project Summary:**

Cherokee Park, Inc (CPI) requests approval of a 47-Lot residential subdivision on the lands commonly known as the 'Fifth Addition to Cherokee Neighborhood'

(5<sup>TH</sup> Addition). Planning to date has been done in accord with the City of Madison's (City) Special Area Plan (SAP) adopted on 01-16-2007.

The property consists of 40+/- acres annexed into the City on 02-11-2008. The property is currently in the process of a CSM review by City Planning staff. The portion of the property, described as Outlot 1, is slated to be conveyed to the National Heritage Land Trust in May, 2008 through a fee simple exchange, which will then be conveyed to City Parks Department.

The remaining property (26.0263 Acres) will be divided into 47 lots to be sold fee simple, with various outlots retained by CPI for storm water management purposes, and streets and associated ROW's conveyed to the City. As indicated in the enclosed plans, several lots will have easements recorded which allow for storm water management, as well.

The property is to be entered via North Sherman Avenue, with a pedestrian/bicycle path connecting it to the Burning Wood Development to the West.

**Existing Conditions and Uses:**

The majority of this property is currently used for agricultural purposes. A portion of the remaining lands are used as a stockpile for fill excavated from previous development. This stockpile will be distributed on site to accommodate the proposed grading plan. The remaining lands should be described as wooded. Every effort will be made to assure the integrity of the majority of this area, as indicated in the tree preservation plan.

**Development Schedule:**

CPI intends to develop the entire site to include public utilities, streets, sidewalks, etc. in the fall of 2008, with individual lot sales and home construction to begin immediately following. Our current plan calls for building 7-10 units per year. At this rate, the development should be completed in 2013-2015.

**Character and Quality:**

CPI will act as General Contractor in the building of the single family homes, and will reserve the right for architectural review.

CPI respects the natural beauty of the site and considers it as asset to developing a high-quality, urban, walkable neighborhood in a park-like setting.. Design character will be controlled with covenants and restrictions that include specific design standards for the entire development. The emphasis of these covenants will be on natural building materials and design with an 'eco-friendly' approach, as well as a strong emphasis on storm water management practices to protect the sensitive surrounding areas.

Further restrictions will be placed on lots located in 'eco-sensitive' areas, including, but not limited to, lots within the FEMA flood plain 300-foot buffer zone, which have specific lot size (15,000-SF and 100' road frontage) and maximum impervious surface limits (33% lot size).

Proposed general design standards area attached.

## **FIFTH ADDITION - PROJECT NARRATIVE**

Cherokee Park, Inc. (CPI) intends to develop a high-quality, low density residential development for the fifth Addition located west of North Sherman Avenue and north of the Cherokee Golf Course.

### Consistency with Adopted Plans

The proposed 47 lot residential development is consistent with the recommendations of the Cherokee Park Special Area Plan adopted by the Common Council on January 16, 2007. The proposed development is also consistent with the Memorandum of Understanding executed between Cherokee Park, Inc. and the City of Madison that allows for the conveyance of Cherokee lands to the City of Madison for public park purposes.

### Design Character

The proposed development will be designed with an “eco-friendly” approach for private lots, common areas and public streets. The proposed development places strong emphasis on stormwater management practices that will sensitively protect the surrounding natural areas. Design character will be controlled by covenants and restrictions which will include general design standards for the entire development area and will be consistent with the Neighborhood Development and Design Principles identified in the Cherokee Special Area Plan (page 16 – 17).

### Public Street Design

A 66 ‘ r.o.w. will be dedicated for the construction of a public loop street that will serve the proposed development. The r.o.w. will include a 32’ wide street with on-street parking and a 5’ wide sidewalk and 11’ wide terraces. Recommended design elements for the public street include pedestrian scale street lighting with “dark sky” fixtures, street trees selected for their native character, and “rain gardens” constructed in the 11’ wide terraces to assist with stormwater infiltration.

### Building Design

CPI will act as the General Contractor in the construction of single family homes. CPI will reserve the right for architectural review based on covenants and design guidelines that will be prepared. The design of homes will focus on Prairie, Craftsman, Bungalow, Cottage and Modernist vernacular styles and will allow architectural freedom of expression within these architectural frameworks. The design of single family lots will focus on lot coverage, drainage, contours, and landscaping with an emphasis on “green” site and native vegetation requirements.

The design guidelines will identify ecologically sound building and site design principles. These principles will emphasize natural or recycled materials, energy efficiency, indoor air quality, and environmental impact. A basic priority ranking system will be developed to review proposed designs. The CPI Architectural Review Committee will identify how proposed designs adhere to the established design principles.



### Protection of Natural Features

The proposed development is designed to protect the existing natural features within the site and surrounding the site. Stormwater management facilities will be designed to protect the Cherokee Marsh to the greatest degree possible. Removal of high-quality trees will be minimized. The proposed development character will complement the natural character of the site including the landscaping and grading of common areas and the design of the interface between the residential development and the Cherokee Marsh Conservation Park. The development will be designed to comply with all applicable environmental corridor regulations.

### Stormwater Management

A stormwater management plan has been prepared as part of this submittal that identifies how the proposed development meets and exceeds applicable regulatory criteria including peak discharge control, water quality control, and groundwater recharge. The stormwater management approach for the Fifth Addition focuses on directing drainage away from lands dedicated to the City of Madison for the expansion of the Cherokee Marsh Conservation Park. Drainage will be captured in a series of infiltration basins located on the back line of private lots, at several locations in the public street terrace, and in several detention basins located in the common outlot on the Southside of the development area. The stormwater management plan also describes how the project will be implemented and provides a general description of the operations and maintenance agreement.

### Connectivity

The Fifth Addition includes a trail connection that links the proposed development to North Sherman Avenue on the east and the Cherokee Park Neighborhood on the west. In the future, an off-street path will be constructed on the Westside of North Sherman Avenue to provide pedestrian and bicycle connections to the Cherokee Country Club and trail systems that are planned for other development areas identified as part of the Cherokee Special Area Plan.

An architectural code shall be set forth along these general guidelines. The intent is not to restrict creativity but to identify guiding principles that will be reviewed for compliance by the architectural review committee.

**Architectural Review Committee:**

Plans are required to be submitted for review both at concept and final submittal stages. The architectural review committee will identify adherence to design (materials & palette), site design (including lot coverage and drainage restrictions), and green building guidelines.

**Design Guidelines:**

Design will center on the vernacular of Prairie, Craftsman, Bungalow, Cottage, and Modernist to allow architectural freedom of expression, but within an architectural framework.

**Site Guidelines:**

Site guidelines will center on lot coverage, drainage, contours, and landscaping with an emphasis on green site and native vegetation requirements.

Roof and site drainage will be required to develop drainage patterns that will not allow flow onto public lands or to adjacent properties. Landscaping easements contiguous to public lands with prescribed green native vegetation options will be identified.

**Green Principles:**

The architectural code will identify ecologically sound building principles to be met or exceeded. These principles will be established by a composite matrix of identifying a basic priority ranking system influenced by (but not duplicating) Energy Star™, Green Built Home™, and NAHB information. Among these principles there will be an emphasis on natural materials or those with recycled content, energy efficiency, indoor air quality, and environmental impact.



# STORMWATER MANAGEMENT PLAN

FOR THE

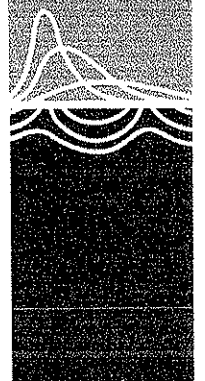
FIFTH ADDITION TO  
CHEROKEE NEIGHBORHOOD

CHEROKEE PARK, INC.

MADISON, WI

March 2008

**Montgomery Associates**  
*Resource Solutions*



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# 1. INTRODUCTION

## 1.1 Background and Purpose

Cherokee Park, Inc. (CPI) is proposing to develop the 5<sup>th</sup> Addition to the Cherokee Neighborhood (hereafter referred to as 5<sup>th</sup> Addition) off North Sherman Drive in the City of Madison (See *Figure A1 and Figure A2*). The 5<sup>th</sup> Addition will comprise of 47 single residential lots on approximately 40 acres. However, only 22 acres of the parcel will be developed with the remainder as park space dedicated to the City (See *Figure A4*).

CPI is submitting a joint preliminary and final plat, and as part of the submittal package, a stormwater management plan is required that conforms to all City and State requirements. Further, the proposed development is located near Cherokee Marsh and Cherokee Lake to the north and west. For this reason, the stormwater management plan aims, to the extent practicable, to preserve groundwater recharge on the site.

## 1.2 Applicable Design and Performance Criteria

The site is subject to City and State performance criteria, as outlined below. In some cases, one level of government has more stringent criteria than another level, in which case the most stringent criteria apply.

### *City of Madison*

The City criteria are contained in the Chapter 37 of the City ordinances, which can be summarized as follows:

- Maintain pre-development peak runoff rates for the 2-, and 10-year, 24-hour events;
- Safely pass the 100-year, 24-hour event;
- Total Suspended Solids (TSS) reduced by 80% on an average annual basis, as compared to no controls;
- Implement practices to infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 90% of the pre-development infiltration volume, based upon an average annual rainfall. If when designing appropriate infiltration systems, more than one (1%) percent of the site is required to be used as effective infiltration area, the applicant may alternately design infiltration systems and pervious surfaces to meet or exceed the estimated average annual recharge rate (7.6" inches per year). If this alternative is taken at least one (1%) percent of the site must be used as part of the effective infiltration area.

Because the site is located adjacent to Cherokee Lake and Cherokee Marsh, the project will maintain existing groundwater recharge on the site even if the stay-on requirement is met.

in addition to these criteria, the City Parks Department has mandated that drainage from the south be directed to the south or west rather than to the north, across the area to be dedicated as park space.

#### *State Criteria*

State of Wisconsin long-term stormwater management requirements are contained in Wisconsin Administrative Code Sections NR 216 and NR 151. These codes are administered by the Wisconsin Department of Natural Resources. The performance standards outlined in NR 216 and NR 151 are as follows:

- The 2-year post-development peak discharge not to exceed the pre-development peak discharge;
- Total Suspended Solids (TSS) reduced by 80% on an average annual basis, as compared to no controls;
- Implement practices to either:
  - Infiltrate a sufficient volume of runoff such that the post-development annual infiltration volume is at least 90% of the pre-development annual infiltration volume; or
  - Dedicate 1 percent of the project site to infiltration practices.

#### *Site Specific Criteria*

Because the site is located adjacent to Cherokee Lake and Cherokee Marsh, the project will maintain existing groundwater recharge on the site.

In addition to these criteria, the City Parks Department has mandated that drainage from the south be directed to the south or west rather than to the north, across the area to be dedicated as park space.

### **1.3 Summary of Plan**

The proposed plan involves two wetland detention basins located along the southern margin of the property (See *Figure A4*) to provide water quality and peak discharge control. Runoff volume reduction and groundwater recharge enhancement will be provided using several street terrace raingardens that will treat the front half of the residential lots. In addition, three rear-lot raingardens are proposed that will treat the rear half of the lots and a portion of the street runoff.

### **1.4 Scope and Procedure**

Montgomery Associates: Resource Solutions, LLC (MARS) was contracted by CPI to develop the stormwater management plan, as well as design details related to the stormwater management features. In this project, MARS has worked closely with General Engineering.

### **1.5 Data Sources**



The following information was used in assembling the stormwater management plan:

- 1-foot topography, site boundaries, and site features based on site survey by Birrenkott Surveying, Inc.
- Storm sewer drainage system layout prepared by General Engineering.
- Typical street cross section details prepared by General Engineering
- Wetland delineations completed by Natural Resources Consulting.
- Dane County Erosion Control and Stormwater Management Manual.
- Soil Survey of Dane County, electronic database format.
- 2005 NAIP orthophoto.

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## 2. INFILTRATION FEASIBILITY EVALUATION

The site is generally characterized by the Soil Survey of Dane County as having soils that are suitable for locating infiltration features. The details on the existing soil types documented by the Soil Survey is described in *Section 3.2*.

In order to confirm the suitability of locating infiltration features throughout the site, test pits were completed, as shown in *Figure F1*. The test pits generally show suitable soils at depth (sand, loamy sand, or sandy loam), with the water table encountered at varying depths in test pits taken at lower ground elevations.

The soil investigation indicated that much of the site has suitable soils for infiltration. However, shall depth to the water table limits the ability to implement infiltration features in some locations, especially along the southern boundary of the site.

### 3. STORMWATER MANAGEMENT PLAN

#### 3.1 Methodology

The performance of the stormwater management plan was analyzed in XP-SWMM (peak discharge), P8 (stay-on and water quality), and RECARGA (recharge).

##### Peak Discharge

XP-SWMM is a computationally and graphically enhanced version of the US EPA stormwater management model (SWMM), distributed by XP software. XP-SWMM analyzes rainfall-runoff performance using watershed characteristics and input rainfall distributions or time series, and calculates runoff hydraulics using hydrodynamic routing procedures. For ease of regulatory review, and also for conformance with ordinance criteria, rainfall-runoff was analyzed using Soil Conservation Service procedures including Curve Numbers (CN) and Time of Concentration (T<sub>c</sub>) data for each sub watershed. These parameters were computed using WinTR-55 methodology to facilitate regulatory review. However, both rainfall-runoff and hydraulic routing modeling were computed using XP-SWMM.

Soil Conservation Service (SCS, now NRCS), 24-hour, Type II rainfall distribution was used in the analysis. Rainfall depths were taken from the Dane County Erosion Control and Stormwater Management Manual, which are summarized in *Table 3-1* below.

**Table 3-1: Summary of Rainfall Depths Used in Analysis**

Storm Duration	Recurrence Interval and Depth (inches)		
	2-year	10-year	100-year
24 Hours	2.9	4.2	6.0

##### Stay-On and Water Quality

P8 was developed in 1990 as a model which simulates the generation and transport of pollutants in stormwater runoff through user-supplied watershed and treatment devices. Watersheds are defined by total area, impervious fraction, impervious depression storage, impervious runoff coefficient, street sweeping frequency, and SCS runoff curve number for pervious portions. Treatment devices are defined with stage-area relationships as well as up to three outlet structures: infiltration, normal outlet, and spillway. The model runs continuously with hourly precipitation and daily average temperature data. The National Urban Runoff Program (NURP) 50th percentile particle file was used for pollution generation. Treatment is calculated using particle settling velocity and specified basin geometry. Continual mass balance calculations are tracked between devices. Hourly rainfall data from Madison, Wisconsin was run between March 12, 1981 and December 2, 1981 as specified in NR 151, which is an annual rainfall of 28.81 inches.

##### Recharge

The RECARGA model was developed at the University of Wisconsin-Madison from 2002 through 2005. This program evaluates the hydrologic budget on focused infiltration areas, considering surface infiltration, soil moisture storage, evapotranspiration, and recharge

groundwater. It has been adopted for use in design of stormwater infiltration systems, both as a general design aid, and as a tool to substantiate design conformance with regulatory requirements, including those of NR 151. The model runs continuously performing mass-balance of calculations throughout the raingarden. Similar to the water quality analysis, hourly rainfall data from Madison, Wisconsin was run between March 12, 1981 and December 2, 1981 as specified in NR 151, which is an annual rainfall of 28.81 inches.

### 3.2 Existing Conditions

#### Hydrologic Parameters

Hydrologic parameters for existing conditions on the 5<sup>th</sup> Addition site were estimated based on current land use and soil types. Land use was estimated based on aerial photography and site observations. Soils were determined based on the Dane County Soil Survey, as shown in *Figure A3*. Soils on the site are Kegonsa silt loam (KeA and KeB), Virgil silt loam, gravelly substratum (VwA), Dresden silt loam (DsC2), St. Charles silt loam (ScB), Wacousta silty clay loam (Wa) and Sable silty clay loam (SaA). All the soils on the site except Wacousta silty clay loam and Sable silty clay loam are considered Hydrologic Soil Group (HSG) B by TR-55. Wacousta silty clay loam and Sable silty clay loam are considered HSG B or D depending on the drainage condition. For the purposes of this analysis, these soils were considered HSG D soils.

The runoff conditions from the site were analyzed using four subwatersheds for site as shown in *Figure B1*, to define drainage leaving the site in various directions and also draining towards a closed depression located in the central portion of the site. Only the areas to be developed were included in the analysis, e.g. the park space located north of the 5<sup>th</sup> Additional residential lots and the regulatory wetland area located on the southern margin of the site were not included in the peak discharge analysis. SCS parameters were developed from the Soil Survey and the site plan. Runoff CN for the site were set based on recommended values for each land use type except for the agricultural areas, where the CN value was set based on the City of Madison ordinance requirement. The SCS parameters for the subwatersheds are summarized below in *Table 3-2*. Detailed WinTR-55 output is contained in *Appendix B*.

**Table 3-2: Summary of Existing SCS Parameters**

Drainage Area Name	Area (ac)	Runoff Curve Number (CN)	Time of Concentration (T <sub>c</sub> ) (min)
E_South	13.61	63	27
E_Northeast	3.89	60	17
E_West	3.46	66	7.7
E_Closed	1.28	48	6.0*
Total	22.24	N / A	N / A

\*Time of concentration assumed, as the closed depression does not overflow for any of the events analyzed.

#### Hydraulic Parameters

There is one natural storage area on-site. Existing subwatershed "Ex\_Closed" drains to this storage area. The geometry and overflow elevation of this natural storage area is summarized

7-8

in *Table 3-3* and *Table 3-4*. This natural storage area was accounted for in estimating peak discharge from the site.

**Table 3-3: Summary of Existing Storage Geometry**

Elevation	Area (ac)
865	0.035
866	0.17
867	0.31
868	0.54
869	0.77
870	0.92

**Table 3-4: Summary of Existing Storage Outlet Structure**

Outlet	Outlet Type	Invert
Primary Outlet	Seepage at 0.5 inches/hour	N / A
Emergency Outlet	50-foot weir (natural ground)	870

### Peak Discharge Analysis

The existing conditions XP-SWMM model schematic is shown in *Figure C1*.

Existing conditions peak runoff rates for the entire site are summarized in *Table 3-5* below for the various recurrence intervals. Peak runoff rates are listed for the entire site. Existing runoff hydrographs for the 2- and 10-year storm events are displayed in *Figure C3* and *Figure C4*. Detailed XP-SWMM output is included in *Appendix C* for the 2- and 10-year events. Additional detailed output can be provided, if requested.

**Table 3-5: Summary of Existing Peak Runoff Rates for Site**

Site Area	Recurrence Interval and Peak Runoff (cfs)		
	2-year	10-year	100-year
Site Only	4.9	17	40

### Infiltration or Stay-On Analysis

The stay-on performance criteria selected for this project was that the post-development average annual infiltration volume be at least 90% of the pre-development infiltration volume. For this reason, the existing conditions (pre-development) infiltration volume had to be analyzed.

A P8 model was assembled that included all the hydrologic and hydraulic parameters outlined above.

Infiltration, as defined by the DNR for the purposes of meeting this performance objective, is designated as "stay-on", which is any precipitation that does not leave the site as runoff. *Table 3-6* summarizes the rainfall, runoff, and stay-on volumes. Please note that the "stay-on" includes the runoff captured by the site's natural storage areas. Additional P8 output is contained in *Appendix D*.

Ninety percent of the existing stay-on (51.71 ac-ft) is 46.54 ac-ft.



**Table 3-6: Summary of Existing Conditions Infiltration (Stay-on)**

Watershed	Rainfall (ac-ft)	Site Runoff (ac-ft)*	Stay-On (ac-ft)**
West	8.31		
East	9.34	1.68	48.64
South	32.67		
In Drain	3.07	0.00	3.07
Total	53.39	1.68	51.71

\*Volume listed is Line 12 in P8 output.

\*\*Stay-on is rainfall minus site runoff.

### Recharge Analysis

Per the City of Madison’s stormwater ordinance, existing groundwater recharge was assumed to be 7.6 inches/year.

## 3.3 Proposed Conditions

### Hydrologic Parameters

The site was divided into several subwatersheds to accurately define drainage flowing to the various best management practices throughout the site (See *Figure B2*). A summary of the SCS Curve Numbers and Times of Concentration are shown below in *Table 3-7*, and detailed WinTR-55 output is located in *Appendix B*. CN values for pervious areas were based on grass in good condition, except for areas within Outlot 10 (southern margin of the site), which were assumed to be meadow. Pervious and impervious areas were separated in the hydraulic analysis to more accurately model a wide range of storm depths. Impervious area was estimated based on the roadway and sidewalk layout and assuming approximately 3,400 sq. ft. of impervious area per lot.

Times of Concentration were assumed to be 6 minutes for all subwatersheds.

**Table 3-7: Summary of Proposed SCS Parameters**

Subarea Name	Total Area (acres)	Pervious Area (acres)	Pervious CN	Impervious Area (acres)	Aggregate CN	Time of Concentration (hrs.)
SE_1	5.24	4.99	61	0.25	63	0.100
S_1	1.67	1.59	60	0.08	62	0.100
SW_1	1.1	1.07	64	0.03	65	0.100
SW_2	0.61	0.33	61	0.28	78	0.100
SW_3	0.46	0.00	61	0.46	98	0.100
W_1	1.02	0.94	65	0.08	68	0.100
NW_1	1.64	1.09	61	0.55	73	0.100
NE_1	2.58	2.25	61	0.33	66	0.100
E_1	1.94	1.35	61	0.59	72	0.100
E_2	0.72	0.00	61	0.72	98	0.100
Centrl_1	1.75	1.28	61	0.47	71	0.100
Centrl_2	1.73	0.95	61	0.78	78	0.100
Centrl_3	1.76	0.15	61	1.61	95	0.100
Total	22.22	15.99	N/A	6.23	N/A	N/A

## Hydraulic Parameters

The proposed stormwater management plan incorporates two methods to controlling runoff from the proposed 5<sup>th</sup> Addition: detention basins and infiltration areas as shown in *Figure A4*. The XP-SWMM model schematic is shown in *Figure C2*.

### *Infiltration Areas*

Infiltration areas (or raingardens) will be located at select locations in the street terrace to treat the front half of lots and at three locations in the rear lots to treat the back half of the lots and a portion of the roadway. Details regarding the construction of the raingardens and their outlet structures are shown on *Sheet 6.0* through *Sheet 6.2* of General Engineering's sheet set titled "5th Addition, Street and Utility Improvements", not attached to this report (See submittal package). Test pits were completed across the site (not necessarily in the exact location of infiltration features) as shown in *Appendix F* and *Section 2* of this report.

For the analysis, in subwatersheds that contained multiple raingardens (Centrl\_2 subwatershed for example), the total infiltration area was lumped into a single infiltration area for each subwatershed. A maximum depth in the raingardens was designed to be six inches. The infiltration areas were assumed to have a constant infiltration rate of either 0.5 inches/hour (sandy loam at depth) or 1.63 inches/hour (sand or loamy sand at depth) consistent with DNR technical standards. Runoff absorbed in the raingardens was modeled assuming the constant infiltration rate (in/hr) multiplied by the infiltration area (acres). *Table 3-8* summarizes the total infiltration area for each subwatershed in the model.

**Table 3-8: Summary of Infiltration Areas**

	Raingarden Location	Raingarden Area (acres)	Infiltration Rate (in/hr)
SW_2	Street Terrace	0.038	0.50
NW_1	Rear Lot	0.038	0.50
NE_1	Rear Lot	0.051	1.63
E_1	Street Terrace	0.039	1.63
Centrl_1	Rear Lot	0.093	1.63
Centrl_2	Street Terrace	0.059	1.63
Total	N / A	0.318	N / A

### *Detention Basins*

Two detention basins ("East" and "West") are proposed to provide additional peak attenuation to meet the City ordinance criteria, as shown in *Figure A4*.

The geometries and outlet structures of the two detention basins are summarized in *Table 3-9* through *Table 3-12* below. Details of the outlet structures are shown on *Sheet 6.0* through *Sheet 6.1* of General Engineering's sheet set titled "5th Addition, Street and Utility Improvements", not attached to this report (See submittal package).

**Table 3-9: Summary of East Detention Basin Geometry**

Elevation	Area (ac)
855	0.468
856	0.596
857	0.726

**Table 3-10: Summary of East Detention Basin Outlet Structure**

Outlet	Outlet Type	Invert
Primary Outlet	90° V-notch weirs	855
Emergency Outlet	20-foot broad crested weir	856.5

**Table 3-11: Summary of West Detention Basin Geometry**

Elevation	Area (ac)
858	0.085
859	0.115
860	0.148
861	0.183

**Table 3-12: Summary of West Detention Basin Outlet Structure**

Outlet	Outlet Type	Invert
Primary Outlet	6" Orifice	858.0
Emergency Outlet	20-foot broad crested weir	860.0

**Performance**

*Peak Discharge*

The proposed stormwater management system meets the peak attenuation criteria as shown in *Table 3-13* below, which summarize the peak discharges from the entire site. Detailed XP-SWMM output is contained in *Appendix C* for the 2- and 10-year events. Additional detailed output can be provided, if requested. *Figure C3* and *Figure C4* illustrate the attenuation effect of the detention basins on the total runoff hydrograph leaving the site.

**Table 3-13: Comparison of Existing and Proposed Peak Discharges**

Scenario	Recurrence Interval and Peak Runoff (cfs)		
	2-year	10-year	100-year
Existing	4.9	17	40
Proposed	3.2	7.9	18

Peak stages in the two detention basins are summarized in *Table 3-14*.

**Table 3-14: Peak Stages in Detention Basins**

Basin	Recurrence Interval and Peak Stage		
	2-year	10-year	100-year
East	855.84	856.37	856.73
West	858.57	859.13	859.94

*Infiltration (Stay-on)*

*Table 3-15* summarizes the "stay-on" under proposed conditions, and *Table 3-16* compares the total site stay-on to the performance objective (90% of existing conditions). Although the proposed site does not meet the 90% stay-on goal, for the purposes of NR 151 compliance, the project meets the infiltration / stay-on criteria by dedicating over one percent of the project area to infiltration practices (0.318 acres for 22.22 acres, which is approximately 1.4 percent). For the

purposes of meeting the City ordinance, the project meets the recharge goal, as outlined in the "recharge" section below. *Appendix D* contains detailed P8 output. Please note that there was a moderate continuity error for the "INF\_E1" raingarden; however, the mass balance error (0.22 ac-ft) is small in comparison to the total site runoff (~14 ac-ft), which is less than 2 percent.

**Table 3-15: Summary of Proposed Conditions Infiltration (Stay-on)**

Rainfall (ac-ft)	Site Runoff Before Controls (ac-ft)*	Infiltration (ac-ft)	Site Runoff After Controls (ac-ft)	Stay-On (ac-ft)**
53.35***	14.06	5.88	8.18	45.17

\*Volume listed is Line 12 in P8 output.

\*\*Stay-on is rainfall minus site runoff after controls.

\*\*\*Rainfall volume is within 0.2 percent of existing rainfall volume (due to slight difference in computed site area).

**Table 3-16: Comparison of Existing and Proposed Stay-On**

Existing (100%)	51.71 ac-ft
Existing (90%)	46.54 ac-ft
Proposed	45.17 ac-ft

*Water Quality (Total Suspended Solids)*

*Table 3-17* summarizes the average annual water quality performance, which far exceeds the 80 percent TSS reduction goal for the site. *Appendix D* contains detailed P8 output.

**Table 3-17: Summary of Proposed Water Quality Performance**

	TSS (lbs.)	TSS (Percent)
Site Loading (Prior to Controls)	4,433	100
Infiltration	414	9.3
Trapped	3,590	81
Total Removed	4,004	90

*Groundwater Recharge*

*Table 3-18* summarizes the average annual recharge performance of the eastern watershed, which exceeds the existing annual rate of 7.6 inches per year. *Appendix E* contains output from RECARGA.

**Table 3-18: Summary of Proposed Recharge Performance**

Scenario	Annual Recharge (in.)
Existing	7.6
Proposed	7.81

## 4. FINAL DESIGN AND MAINTENANCE CONSIDERATIONS

### 4.1 Final Design Development

CPI intends that the natural resource management aspects of the 5th addition, including stormwater management, will be a desirable attribute of the development and will be part of the visual aesthetics of the project. The final design specifications for the infiltration and filtration/detention facilities will be developed to provide an attractive visual appearance, with a maintainable system of vegetation, mulch, and engineered soil. Preliminary design plans and specifications for the raingardens are contained in the General Engineering sheet set "5th Addition, Street and Utility Improvements", *Sheet 6.0* through *Sheet 6.2*.

### 4.2 Erosion Control and Construction Best Management Practices

A detailed erosion control plan will be developed once the construction schedule for the project is developed in order to meet both the City and State requirements for erosion control. The erosion control plan will also focus on limiting sediment inflow to infiltration features as the construction schedule for the raingardens is expected to occur during the site mass grading and roadway / utility construction. Construction phasing and erosion control measures will limit sediment inflow to the raingardens prior to permanent vegetation being established, as described in *Sheet 6.1* and *Sheet 6.2* of the General Engineering sheet set "5th Addition, Street and Utility Improvements".

Prior to restoration of the site, the areas that have undergone major disturbance will be deep tilled to allow effective infiltration following construction. As each lot develops, prior to landscaping the lot, each lot will be deep-tilled again to mitigate for compaction that may have occurred during lot development.

### 4.3 Long-term Ownership and Maintenance of the Stormwater Management Features

It is anticipated that CPI will enter into an agreement with the City of Madison whereby CPI assumes prime responsibility for completion and ongoing maintenance of all stormwater management facilities, including infiltration and detention areas, regardless of their location on easements on private lots, on outlots retained by CPI, or on publicly-owned street terraces. It is expected that this agreement will specify maintenance responsibilities and periodic reporting on the condition of the stormwater management facilities. The agreement will also allow the City of Madison to perform maintenance that may be required should CPI fail to perform, after appropriate noticing, with the ability to assess the costs of the maintenance to CPI.

P. O. Box 340  
Portage, WI 53901



608-742-2169  
608-742-2592 FAX  
gec@generalengineering.net  
www.generalengineering.net

March 3, 2008

Cherokee Park, Inc.  
Attn: Craig Makela, Project Manager  
5000 N Sherman Ave  
Madison, WI 53704

Re: Cherokee Park 5<sup>th</sup> Addition  
Utility Calculations  
GEC # 1107-155C

Dear Craig,

Please find the attached water main calculations and existing lift station capacity evaluation for the proposed utility improvements for the 5<sup>th</sup> Addition to Cherokee Park.

The proposed 10" watermain extension from Burning Wood Way to the 5<sup>th</sup> Addition will supply sufficient water pressure for the planned residential development. The WisDNR minimum fire flow for hydrants for a residential development is 500 gpm at a pressure of 20 psi or greater. As illustrated on Sheet 2 of the Water Main Flow Calculations, a proposed hydrant on North Sherman Avenue will have significantly greater pressure and flow than the WisDNR minimum.

Based upon the data supplied by the City of Madison, the Cherokee Lift Station No. 2, located at 1550 Comanche Glen does have sufficient capacity to serve an additional 48 residential units located in the 5<sup>th</sup> Addition area. Please see the attached calculations and data for further details. This capacity evaluation was based upon actual flow data from the summer of 1996. The average flow and peak flow was used from this data. A system curve was not generated as the City did not have a pump curve on file for this lift station.

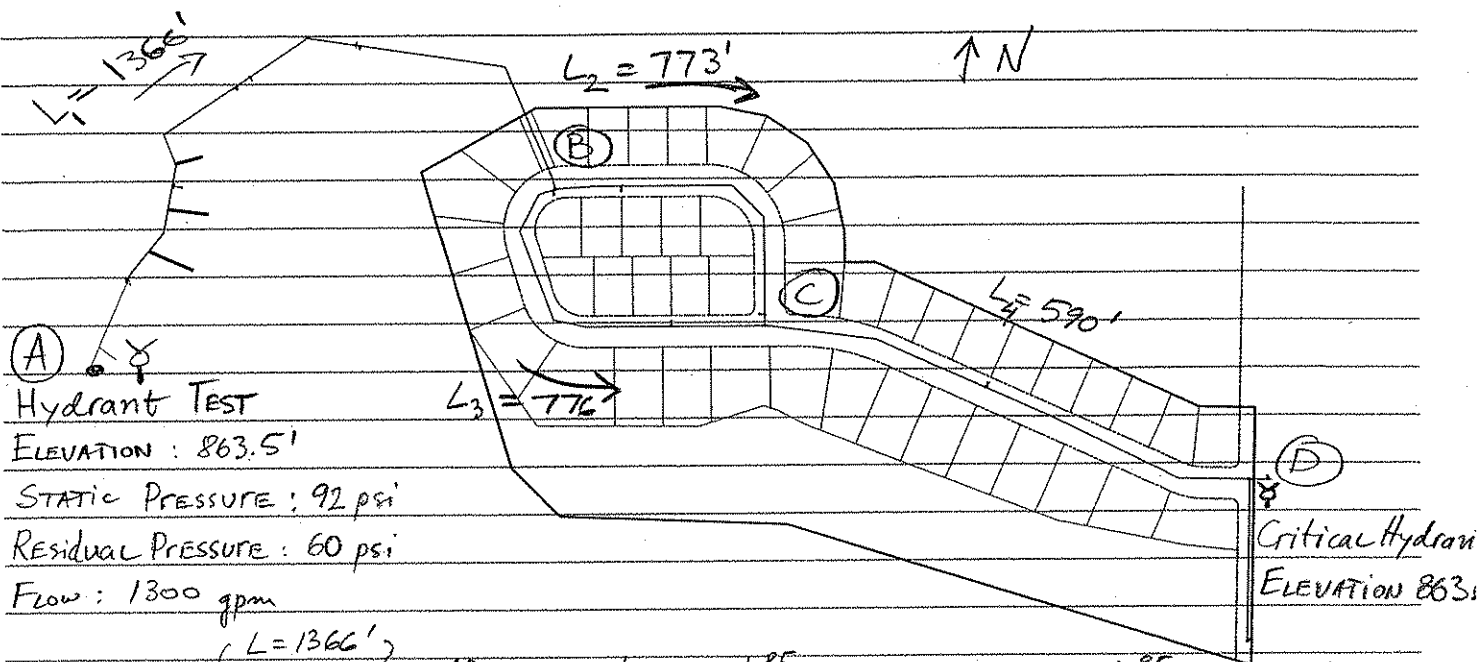
If you have any questions or comments please feel free to call at anytime.

Sincerely,

**GENERAL ENGINEERING COMPANY**

A handwritten signature in black ink that reads 'Scott J. Anderson'.

Scott J. Anderson, PE  
Project Engineer



① Pipe AB  $\left\{ \begin{array}{l} L = 1366' \\ \phi = 10'' \\ C = 120 \\ Q = 1300 \text{ gpm} \end{array} \right\} h_{F, AB} = \frac{10.44 \cdot L(\text{FT}) \cdot Q(\text{GPM})^{1.85}}{C^{1.85} \cdot \phi^{4.87} (\text{INCHES})} = \frac{10.44 \cdot 1366 \cdot 1300^{1.85}}{120^{1.85} \cdot 10^{4.87}} = 15.8'$

② Loop BC. ASSUME FLOW IS PROPORTIONAL TO PIPE LENGTH

NORTH BC Loop  $\left\{ \begin{array}{l} L = 773' \\ \phi = 10'' \\ C = 120 \\ Q = \frac{1300}{2} = 650 \text{ gpm} \end{array} \right\} h_{F, BC}^{\text{NORTH}} = \frac{10.44 \cdot 773 \cdot 650^{1.85}}{120^{1.85} \cdot 10^{4.87}} = 2.48'$

SOUTH BC Loop  $\left\{ \begin{array}{l} L = 776' \\ \phi = 10'' \\ C = 120 \\ Q = 650 \text{ gpm} \end{array} \right\} h_{F, BC}^{\text{SOUTH}} = \frac{10.44 \cdot 776 \cdot 650^{1.85}}{120^{1.85} \cdot 10^{4.87}} = 2.49'$

③ PIPE CD  $\left\{ \begin{array}{l} L = 590' \\ \phi = 10'' \\ C = 120 \\ Q = 1300 \text{ gpm} \end{array} \right\} h_{F, CD} = \frac{10.44 \cdot 590 \cdot 1300^{1.85}}{120^{1.85} \cdot 10^{4.87}} = 6.82'$



916 Silver Lake Dr. • P.O. Box 340 • Portage, WI 53901  
 Phone: 608-742-2169 Fax: 608-742-2592  
 e-mail: gec@generalengineering.net

Subject: 5 <sup>TH</sup> ADDITION Cherokee Park	
WM Calculations	
Engineer: SSR	Date: 2/1/2008
Sheet: 1 of 2	File: 1107-'155 C

$$\text{TOTAL HEAD LOSS (HAD)} = 15.8' + \frac{(2.5 + 2.5)}{2} + 6.8 + (863 - 863.5)$$

$$\text{HAD} = 24.6 \text{ ft}$$

$$\text{HAD} = 24.6 \times \frac{0.433 \text{ psi}}{\text{ft}} = 10.65 \text{ psi drop}$$

$$\Rightarrow \text{Critical Hydrant Flow is } 1300 \text{ gpm @ } (60 - 10.65) \\ = 49.3 \text{ psi}$$

Convert to 20 psi flow

$$Q_{20} = Q_{\text{critical Hydrant}} \cdot \left( \frac{P_s - 20 \text{ psi}}{P_s - P_r} \right)^{0.54}$$

$$Q_{20} = 1300 \cdot \left( \frac{92 - 20}{92 - 49.3} \right)^{0.54} = 1723 \text{ gpm}$$

$$\Rightarrow \text{Critical Hydrant Flow @ } 20 \text{ psi} = 1723 \text{ gpm}$$

$$1723 \text{ gpm @ } 20 \text{ psi} > 500 \text{ gpm @ } 20 \text{ psi}$$

**GENERAL**  
ENGINEERING COMPANY

916 Silver Lake Dr. • P.O. Box 340 • Portage, WI 53901  
Phone: 608-742-2169 Fax: 608-742-2592  
e-mail: gec@generalengineering.net

Subject: 5 <sup>TH</sup> Addition Cherokee Park WM Calculations
Engineer: SSR Date: 2/11/08 7-8
Sheet: 2 of 2 File: 1107-155C





**FLOW TEST REPORT**  
**Madison Water Utility, Wisconsin**

This form must be submitted with any related application to the **Madison Fire Department**.

Project Address: **1501 Burning Wood Way**

Date Requested: **1/17/06**

Requested By: Name: **Scott Anderson**

Company: **General Engineering**

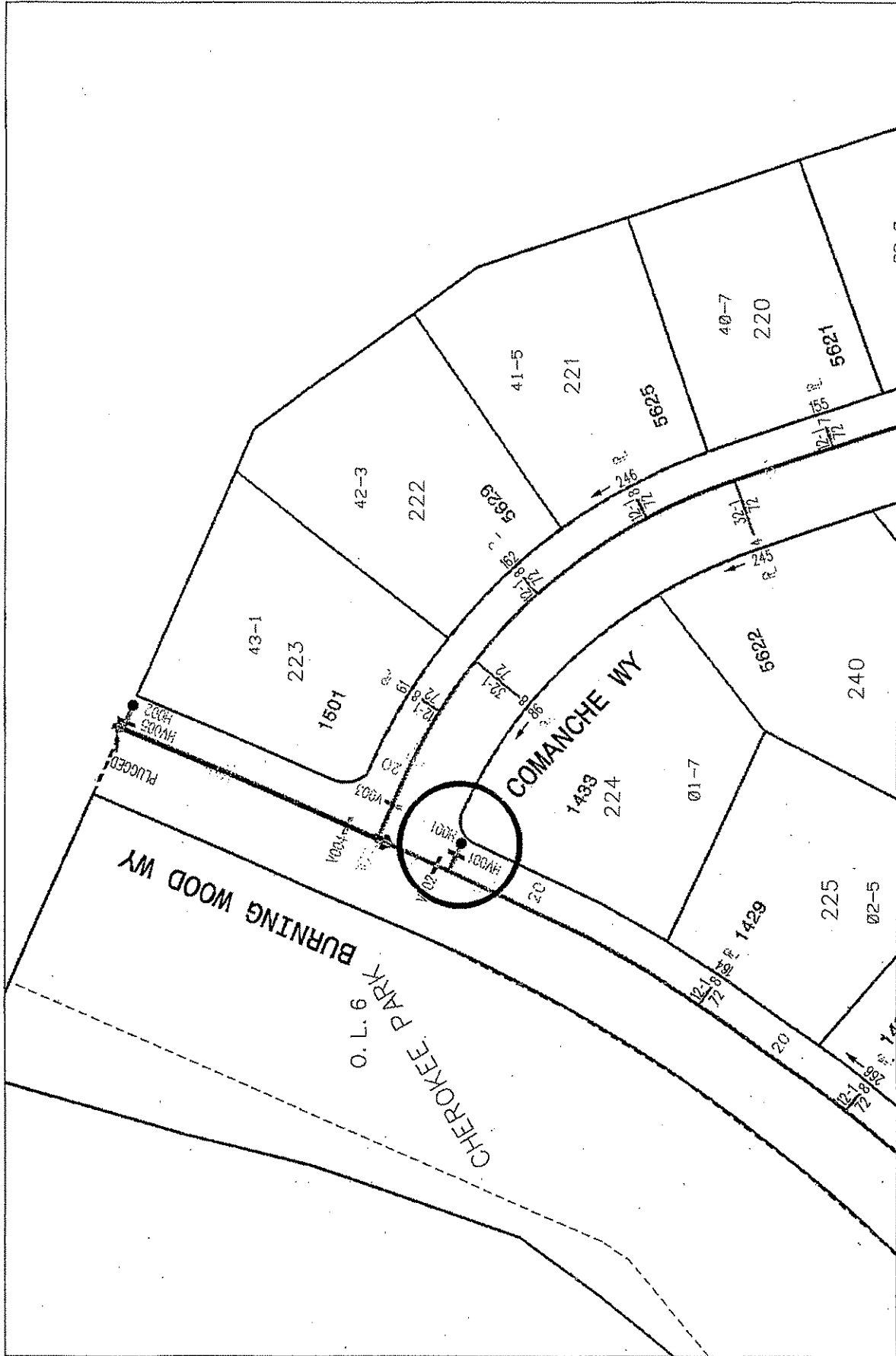
Field Results	Hydraulic Computer Model Results																		
<b>Flow Test Location: Burning Wood Way &amp; Commanche Way</b> Hydrant Number: <b>H001</b> Hydrant Page Number: <b>P 5314</b> Date of Flow Test: <b>1/19/06</b> Flow Test Time-of-Day: <b>12:40 PM</b> Main Size: <b>8"</b> Benchmark (if available): City of Madison Datum	<b>Flow Test Location: Burning Wood Way &amp; Commanche Way</b> Date of Model Run: <b>1/20/06</b> Main Size: <b>10</b> Model Elevation: City of Madison Datum <b>16.10</b>																		
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:20%;"></th> <th style="width:40%;">Pressure (psi)</th> <th style="width:40%;">Flow (gpm)</th> </tr> </thead> <tbody> <tr> <td>Static</td> <td align="center">92</td> <td align="center">0</td> </tr> <tr> <td>Residual</td> <td align="center">60</td> <td align="center">1300</td> </tr> </tbody> </table>		Pressure (psi)	Flow (gpm)	Static	92	0	Residual	60	1300	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:20%;"></th> <th style="width:40%;">Pressure (psi)</th> <th style="width:40%;">Flow (gpm)</th> </tr> </thead> <tbody> <tr> <td>Static</td> <td align="center">92</td> <td align="center">0</td> </tr> <tr> <td>Residual</td> <td align="center">60</td> <td align="center">1300</td> </tr> </tbody> </table>		Pressure (psi)	Flow (gpm)	Static	92	0	Residual	60	1300
	Pressure (psi)	Flow (gpm)																	
Static	92	0																	
Residual	60	1300																	
	Pressure (psi)	Flow (gpm)																	
Static	92	0																	
Residual	60	1300																	
<b>Conditions of Flow Test:</b> Flow test type (1 or 2 hydrants): <b>1</b> Total System Flow for date of test: <b>30307</b> System Flow % of 2003 Max Day: <b>56%</b> Wells out of Service: <b>6,7,8,10,11,17,27,28</b>	<b>Conditions of Flow Test:</b> Demands: <b>Average Hour of 2003 Max Day Demands</b> Wells out of Service:																		

**Disclaimer:**

This flow data is provided based on the best information available to Madison Water Utility at the time of the test. Madison Water Utility provides the information on this form with the understanding that available pressures at hydrants will vary as much as +/- 15 psi depending on the time of day, time of year, operating wells at the time of the test and many characteristics of the water system that are subject to change. Fire protection system designers need to take the +/-15 psi into consideration when preparing the hydraulic calculations for this project.

Computer model results are provided as a method of simulating conditions on the maximum water demand day and should be considered when evaluating available fire flows and pressures. The model results represent conditions in the water main, and do not account for head losses in the hydrant.

*If the field test and the model results indicate different residual pressures, the lower of the two should be used for design purposes.*



Scale: 1 in = 75.0 Ft

Time: 2:54:35 PM

Date: 1/17/2006  
Field View

**CAPACITY EVALUATION  
CHEROKEE NO. 2 LIFT STATION  
5TH ADDITION TO CHEROKEE HILLS**

**Average Dane County Population**

Average No. of Persons in Household							
	Total Households	2 Persons	3 Persons	4 Persons	5 Persons	6 Persons	7 Persons
<b>Municipality</b>							
Village of Shorewood Hills		244	98	118	33	8	4
Total Persons	1,495	488	294	472	165	48	28
Total Households	660						
Persons per Household	2.27						
<b>City of Middleton</b>							
Total Persons	11,705	1,909	862	827	302	56	21
Total Households	7,095	3,818	2,586	3,308	1,510	336	147
Persons per Household	1.65						
<b>Village of Waunakee</b>							
Total Persons	8,099	814	534	676	279	63	56
Total Households	3,203	1,628	1,602	2,704	1,395	378	392
Persons per Household	2.53						
<b>City of Monona</b>							
Total Persons	5,855	1,075	443	361	125	36	13
Total Households	3,768	2,150	1,329	1,444	625	216	91
Persons per Household	1.55						
<b>City of Verona</b>							
Total Persons	6,024	680	418	530	195	42	9
Total Households	2,591	1,360	1,254	2,120	975	252	63
Persons per Household	2.32						
<b>City of Sun Prairie</b>							
Total Persons	16,988	2,182	1,303	1,273	494	128	55
Total Households	7,881	4,364	3,909	5,092	2,470	768	385
Persons per Household	2.16						

Above information from Demographic Services Center, Department of Administration

**Design Population for 5th Addition**

For design use 3 persons per household  
48 Lots X 3 Persons per Lot = 144 Persons



916 Silver Lake Drive  
P.O. Box 340  
Portage, WI 53901  
608-742-2169  
608-742-2592 Fax  
gec@generalengineering.net

<b>Subject:</b> 5th Addition Cherokee Hills	
Cherokee Park, Inc.	
<b>Date:</b> 01/31/08	<b>Engineer:</b> MAK
<b>Sheet:</b> 1 of 2	<b>GEC No.:</b> 1107-155C

7-8

**CAPACITY EVALUATION  
CHEROKEE NO. 2 LIFT STATION**

**Lift Station Data**

Installed: 1971-72  
 Type: USEMCO Duplex Flooded Suction  
 Pump Capacity: 400 GPM @ 35'  
 Wetwell: 6-Ft. Diameter

**Existing Flow**

MMSD Records 3/4/96 - 6/24/96 (High flow period due to I/I)

Date	Flow	Date	Flow	Date	Flow	Date	Flow
3/4/96	264,000	4/1/96	264,000	4/29/96	240,000	6/3/96	408,000
3/11/96	264,000	4/8/96	240,000	5/6/96	336,000	6/10/96	384,000
3/18/96	216,000	4/15/96	288,000	5/13/96	312,000	6/17/96	552,000
3/25/96	240,000	4/22/96	264,000	5/28/96	288,000	6/24/96	432,000
GPW	246,000		264,000		294,000		444,000
GPD	35,143		37,714		42,000		63,429
GPM	24		26		29		44
Average Daily for Period			44,571 GPD		31 GPM		
Average Daily Maximum Week			78,857 GPD		55 GPM		

**Flow to Lift Station**

48 Lots  
 3 Persons per Lot  
 100 GPD/Person  
 Peaking Factor of 4  
 $Q = 48 \times 3 \times 100 = 14,400 \text{ GPD}$

	Maximum Week				Average Week			
	Ave. Daily		Peak Daily		Ave. Daily		Peak Daily	
	GPD	GPM	GPD	GPM	GPD	GPM	GPD	GPM
48 Lots	14,400	10.0	57,600	40.0	14,400	10.0	57,600	40.0
Existing	78,857	54.8	315,428	219.0	44,571	31.0	178,284	123.8
Total	93,257	64.8	373,028	259.0	58,971	41.0	235,884	163.8

**Maximum design flows are less than station capacity of 400 GPM.  
 No upgrades to pumping capacity are necessary.**



916 Silver Lake Drive  
 P.O. Box 340  
 Portage, WI 53901  
 608-742-2169  
 608-742-2592 Fax  
 gec@generalengineering.net

<b>Subject:</b> 5th Addition Cherokee Hills	
Cherokee Park, Inc.	
<b>Date:</b> 01/31/08	<b>Engineer:</b> MAK
<b>Sheet:</b> 2 of 2	<b>GEC No.:</b> 1107-155C

**NUMBER OF FAMILY AND NON-FAMILY HOUSEHOLDS BY NUMBER OF PERSONS IN THE HOUSEHOLD  
FOR WISCONSIN COUNTIES AND MUNICIPALITIES: APRIL 1, 2000**

(part) indicates that the municipality crosses county lines

(SOURCE: TABLE P26, SF1 CD-ROM, U.S. BUREAU OF THE CENSUS

(PREPARED BY DEMOGRAPHIC SERVICES CENTER, WISCONSIN DEPARTMENT OF ADMINISTRATION)

DOA CODE	FIPS STATE/ COUNTY/ PLACE CODE	Municipality Name and Type	Total Households	Family Households							Non-Family Households								
				Total Family HH	2 Person HH	3 Person HH	4 Person HH	5 Person HH	6 Person HH	7+ Person HH	Total Non-Family HH	1 Person HH	2 Person HH	3 Person HH	4 Person HH	5 Person HH	6 Person HH	7+ Person HH	
				13002	5502500875	Albion town	726	516	241	109	110	42	10	4	210	160	41	6	2
13004	5502507025	Berry town	408	327	154	69	69	23	8	4	81	64	14	2	1	0	0	0	0
13006	5502507825	Black Earth town	166	139	72	26	26	7	5	3	27	20	6	1	0	0	0	0	0
13008	5502508350	Blooming Grove town	723	457	201	98	102	40	11	5	266	193	63	9	0	1	0	0	0
13010	5502508500	Blue Mounds town	291	248	109	45	56	26	9	3	43	29	12	2	0	0	0	0	0
13012	5502509775	Bristol town	928	781	288	189	200	81	16	7	147	100	37	10	0	0	0	0	0
13014	5502511150	Burke town	1,148	862	375	214	192	60	12	9	286	201	74	7	4	0	0	0	0
13016	5502514650	Christiana town	1,338	1,118	463	221	282	106	33	13	220	153	58	7	1	1	0	0	1
13018	5502517200	Cottage Grove town	335	271	117	42	60	35	12	2	115	89	19	4	2	1	0	0	0
13020	5502517800	Gross Plains town	486	405	180	80	96	35	12	2	64	41	20	2	1	0	0	0	0
13022	5502518725	Dane town	760	596	249	141	143	51	6	6	81	61	18	2	0	0	0	0	0
13024	5502519275	Deerfield town	2,079	1,564	776	343	293	114	29	9	515	366	122	4	2	0	0	0	0
13026	5502521100	Dunkirk town	3,152	1,243	525	301	200	117	51	49	1,909	1,319	465	84	24	11	4	2	2
13028	5502521125	Dunn town	437	341	149	69	74	35	11	3	96	70	26	0	0	0	0	0	0
13032	5502548025	Madison town	447	362	156	71	92	28	11	4	85	63	21	1	0	0	0	0	0
13034	5502550250	Mazomanie town	1,572	1,317	520	273	340	138	32	14	255	182	66	5	1	0	0	0	1
13036	5502550475	Medina town	603	499	221	90	116	42	16	7	104	90	26	2	1	0	0	0	0
13038	5502551600	Middleton town	1,063	928	365	194	231	111	21	6	135	91	37	5	2	0	0	0	0
13040	5502554100	Monroe town	253	197	94	36	49	11	6	1	56	39	12	4	0	0	0	0	0
13042	5502560225	Oregon town	1,099	897	400	185	193	84	28	7	202	138	58	6	0	0	0	0	0
13044	5502562050	Perry town	243	193	81	46	42	16	7	1	50	26	23	0	0	0	0	0	1
13046	5502563375	Pleasant Springs town	603	499	221	90	116	42	16	7	104	90	26	2	1	0	0	0	0
13048	5502565575	Primrose town	689	561	247	127	127	40	16	4	128	94	30	5	0	0	0	0	0
13050	5502569850	Roxbury town	570	441	203	83	99	37	14	5	129	90	34	5	0	0	0	0	0
13052	5502570400	Rutland town	967	771	318	136	188	90	26	13	196	139	46	10	1	0	0	0	0
13054	5502575850	Springdale town	806	654	256	149	152	76	17	4	152	99	40	12	1	0	0	0	0
13056	5502575875	Springfield town	298	242	106	43	59	23	10	1	56	38	16	0	0	2	0	0	0
13058	5502578625	Sun Prairie town	758	601	288	98	136	60	16	3	157	119	29	8	1	0	0	0	0
13060	5502582525	Vermont town	461	369	143	83	96	33	12	2	92	67	21	3	1	0	0	0	0
13062	5502582625	Vienna town	1,546	1,049	587	171	200	70	17	4	497	394	88	13	2	0	0	0	0
13064	5502582750	Westport town	1,880	1,550	649	368	337	148	36	12	330	221	92	8	7	2	0	0	0
13066	5502586125	Westport town	252	195	89	38	34	23	6	5	57	43	8	1	2	0	0	0	0
13068	5502587750	Windsor town	725	511	226	125	116	29	13	2	214	170	39	5	0	0	0	0	0
13070	5502589450	York town	514	359	152	84	90	23	9	1	155	130	24	0	1	0	0	0	0
13106	5502506300	Belleville village (part)	289	201	77	59	53	11	1	0	88	72	16	0	0	0	0	0	0
13107	5502507800	Black Earth village	179	149	55	35	48	8	3	0	30	23	7	0	0	0	0	0	0
13108	5502508475	Blue Mounds village	433	284	134	64	63	19	3	1	149	130	16	2	1	0	0	0	0
13109	5502510075	Brooklyn village (part)	1,427	1,085	364	275	300	111	22	13	342	230	85	18	5	4	0	0	0
13111	5502512225	Cambridge village (part)	851	688	213	68	22	22	4	4	273	65	6	3	1	0	0	0	0
13112	5502517175	Cottage Grove village																	
13113	5502517775	Cross Plains village																	



**Weekly Flows and Precipitation at Madison Pump Stations within the MMSD PS 13 Basin**

Week Of	Precipitation (inches)	Cherokee 1		Cherokee 2		Fremont		Harper		Truax		Vieth		Westport		Wright		Flow at Nine Springs WWTP						
		Rated Capacity 400 [gpm]	Run Time [hours]	Flow [gallons]	Rated Capacity 400 [gpm]	Run Time [hours]	Flow [gallons]	Rated Capacity 1800 [gpm]	Run Time [hours]	Flow [gallons]	Rated Capacity 1000 [gpm]	Run Time [hours]	Flow [gallons]	Rated Capacity 400 [gpm]	Run Time [hours]	Flow [gallons]	Rated Capacity 200 [gpm]	Run Time [hours]	Flow [gallons]	Rated Capacity 200 [gpm]	Run Time [hours]	Flow [gallons]	High	Low
3/4/96	0.19	14	336,000	11	264,000	48	5,184,000	19	7	36	2,160,000	19	456,000	11	132,000	2	24,000	2	24,000	2	24,000	257,010		
3/11/96	0.08	14	336,000	11	264,000	48	5,184,000	21	7	30	1,800,000	18	432,000	11	132,000	2	24,000	2	24,000	2	24,000	255,920		
3/18/96	0.39	14	336,000	9	216,000	46	4,968,000	19	7	35	2,100,000	18	432,000	11	132,000	2	24,000	2	24,000	2	24,000	260,630		
3/25/96	0.15	14	336,000	10	240,000	46	4,968,000	20	7	28	1,680,000	18	432,000	10	120,000	2	24,000	2	24,000	2	24,000	261,650		
4/1/96	0.18	14	336,000	11	264,000	46	4,968,000	18	7	32	1,920,000	17	408,000	10	120,000	0	0	0	0	0	0	253,850		
4/8/96	0.13	15	360,000	10	240,000	47	5,076,000	22	7	28	1,680,000	19	456,000	10	120,000	2	24,000	2	24,000	2	24,000	261,260		
4/15/96	1.22	15	360,000	12	288,000	46	4,968,000	21	7	35	2,100,000	19	456,000	12	144,000	2	24,000	2	24,000	2	24,000	268,140		
4/22/96	0.1	15	360,000	11	264,000	45	4,968,000	21	7	31	1,860,000	18	432,000	11	132,000	2	24,000	2	24,000	2	24,000	263,760		
4/29/96	1.13	15	360,000	10	240,000	47	5,076,000	21	7	40	2,400,000	18	432,000	10	120,000	4	48,000	4	48,000	4	48,000	270,720		
5/6/96	1.45	22	528,000	14	336,000	49	5,292,000	25	7	44	2,640,000	18	432,000	10	120,000	6	72,000	6	72,000	6	72,000	277,600		
5/13/96	0.41	18	432,000	13	312,000	47	5,076,000	23	7	47	2,820,000	20	480,000	11	132,000	23	276,000	23	276,000	23	276,000	278,900		
5/20/96	0.99	18	432,000	12	288,000	53	5,724,000	25	7	37	2,220,000	22	528,000	12	144,000	9	108,000	9	108,000	9	108,000	297,640		
5/28/96	1.19	13	312,000	12	288,000	40	4,320,000	19	7	37	2,220,000	17	408,000	10	120,000	7	84,000	7	84,000	7	84,000	304,410		
6/3/96	2.66	24	576,000	17	408,000	48	5,184,000	38	7	72	4,320,000	22	528,000	11	132,000	12	144,000	12	144,000	12	144,000	304,170		
6/10/96	0.78	25	500,000	15	384,000	49	5,292,000	58	7	75	4,500,000	23	552,000	11	132,000	14	168,000	14	168,000	14	168,000	293,520		
6/17/96	4.79	42	1,008,000	23	552,000	59	6,372,000	141	7	137	8,220,000	23	552,000	9	108,000	22	264,000	22	264,000	22	264,000	475,660		
6/24/96	0.37	22	528,000	18	432,000	53	5,724,000	63	7	67	4,020,000	22	528,000	12	144,000	18	216,000	18	216,000	18	216,000	325,330		
Average through week of 4/22/96			345,000		255,000		5,022,000	20			1,912,500		438,000		129,000		21,000		21,000		21,000	260,303		
Average Flow			2.92		2.16		1.27	7.01			4.30		1.26		1.12		12.57		1.83		12.57	475,560	1,830	230,410
High/Low Range			1,008,000		216,000		6,372,000				8,220,000		552,000		144,000		254,000		475,560		24,000	475,560	1,000	230,410

NOTE: Harper P.S. is a pneumatic ejector. Run time is hours of compressor runtime which normally is directly related to flow. No attempt was made to approximate flows from the Harper P.S.


Cherokee #2

P. O. Box 340  
Portage, WI 53901



608-742-2169  
608-742-2592 FAX  
gec@generalengineering.net  
www.generalengineering.net

**MEMO**

**FROM:** Scott Anderson, P.E.   
**DATE:** March 3, 2008  
**SUBJECT:** Tree Preservation Plan  
5<sup>th</sup> Addition to Cherokee Park

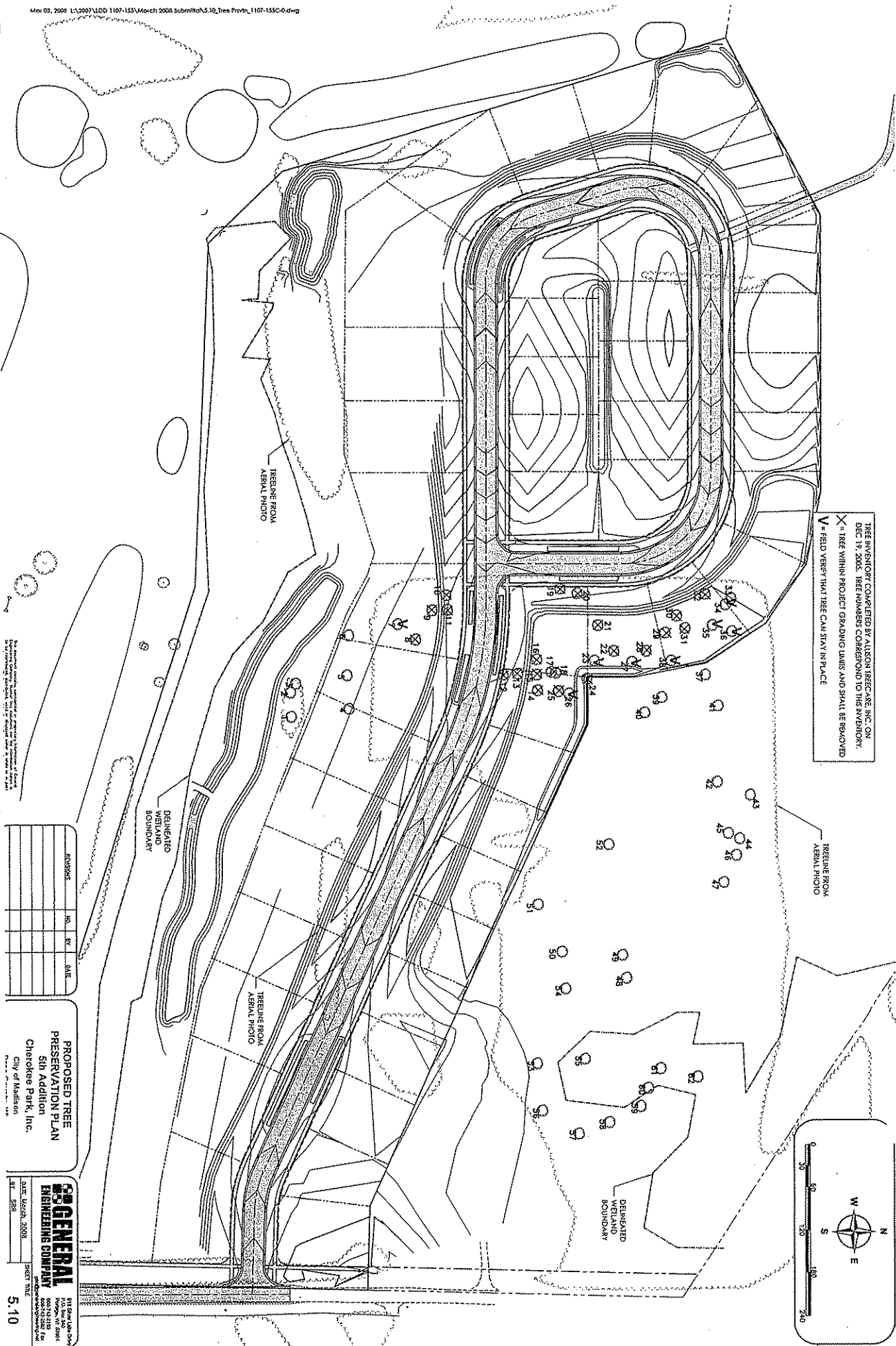
In December of 2005, Allison Treecare, Inc. of Verona, WI conducted a tree inventory of the 5<sup>th</sup> Addition property at Cherokee Park. The purpose of this inventory was to identify the species, size, and condition of particular trees that would be considered in the planning phases of land development. The tree locations were surveyed and documented for the inventory. A copy of the original tree inventory has been included for your use.

The tree inventory found approximately 62 trees in the 5<sup>th</sup> Addition area. Using the surveyed tree location, a site plan was generated (please see the attached sheet 5.10 for details) illustrating which trees need to be removed as part of the 5<sup>th</sup> Addition development at Cherokee Park. Of the 62 inventoried trees, 22 (35%) will need to be removed as part of the development, 9 (15%) may be able to stay intact (depending on house location and care taken construction activities), 31 (50%) will not be impacted by this development.

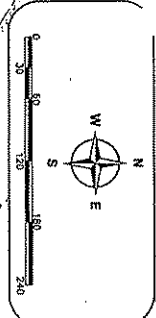
Every effort will be made during construction activities to preserve existing trees.

7-8





TREE INVENTORY COMPLETED BY AUSTON TREE CARE, INC. ON  
 DEC. 19, 2005. TREE NUMBERS CORRESPOND TO THIS INVENTORY.  
 X = TREE WITHIN PROJECT GRADING LINES AND SHALL BE REMOVED  
 V = FIELD VERIFY THAT TREE CAN STAY IN PLACE



REVISION	NO.	BY	DATE

**PROPOSED TREE PRESERVATION PLAN**  
 Site Addition  
 Cherokee Park, Inc.  
 City of Madison

**GENERAL ENGINEERING COMPANY**  
 1110 South Lakeshore  
 Madison, WI 53704  
 608-261-2222 Fax  
 608-261-2222 Tel  
 www.generaleng.com

DATE: March 2008  
 BY: SRS

PROJECT TITLE  
**5.10**



1830 Sugar River Road • Verona, Wisconsin 53593 • (608) 271-4126 • (608) 271-4125 Fax

RECEIVED  
DEC 19 2005

BY:.....

**CHEROKEE PARK TREE INVENTORIES OF HICKORY  
WOODS AND FIFTH ADDITION-SIX WOODS**

December 19, 2005

Prepared For:  
Cherokee Park, Inc.  
Dennis Tiziani  
5000 North Sherman Avenue  
Madison, Wisconsin 53704

Submitted By:  
R. Bruce Allison  
Registered Consulting Arborist #272  
Allison Tree Care, Inc.  
1830 Sugar River Road  
Verona, Wisconsin 53593

*Backyard  
games*

*2-8*

Tree inventories were conducted for two wooded sites on the Cherokee Park property, the Hickory Woods and the Fifth Addition – Six Woods. Aerial photos were provided by Schreiber Andersen Associate, Inc. identifying the location (see attachment). The purpose of the inventory is to identify those trees that due to species, size and condition will be considered in the planning phase of land development. The tree location can now be surveyed and placed on the site plan.

The inventories were conducted by R. Bruce Allison of Allison Tree Care, Inc. and assistants during the week of December 12 – 18, 2005. Surveyor's ribbons were wrapped around each trunk with a unique identification number assigned, measurements taken and a visual assessment of general condition made.

Only the desirable species (oak, hickory, cherry and hackberry) with trunk diameters around 24 inches or greater were inventoried. Boxelder and cottonwood were not included. Dead or severely defective trees were excluded with just a few exceptions. Those exceptions were noted as poor condition.

A more detailed stability analysis of those trees of questionable structural integrity should be conducted prior to placing a building or other targets directly beneath.

The Hickory Woods had 70 inventoried trees including 25 bur oak, 8 cherry, 3 hackberry, 44 hickory and 1 white oak. The trunk diameter range is 12 inches to 42 inches.

The Fifth Addition – Six Woods had 62 inventoried trees including 49 bur oak, 1 hackberry, 4 hickory, 2 red oak and 8 white oak. The trunk diameter range from this group of trees is 14 inches to 42 inches.

During the planning process, be aware of the biological needs of the trees. Avoid root zone loss protecting as much of the critical root zone as possible. The critical root zone is defined as an area around the trunk with a radius 12 to 18 times the trunk diameter.

Cherokee Park Hickory Woods Inventory				
ID #	Species	DBH (Inches)	Condition	Comment
8	Bur oak	18	Good	
43	Bur oak	18	Good	
2	Bur oak	20	Good	
22	Bur oak	22	Fair	Top dieback and broken branches
21	Bur oak	24	Good	
42	Bur oak	24	Good	
67	Bur oak	24	Good	Note decay at bottom of trunk
10	Bur oak	25	Good	
32	Bur oak	26	Good	
46	Bur oak	26	Good	
65	Bur oak	26	Poor	Top is broken out
66	Bur oak	26	Good	
39	Bur oak	28	Good	
1	Bur oak	30	Good	
3	Bur oak	30	Good	
13	Bur oak	30	Good	
14	Bur oak	30	Poor	Lean to north, cavity
69	Bur oak	30	Good	
19	Bur oak	34	Good	
48	Bur oak	34	Good	
29	Bur oak	36	Good	Branch dieback
47	Bur oak	36	Good	
16	Bur oak	38	Fair	Fungal conks at the base and trunk decay
57	Bur oak	40	Good	Co-dominant branches
68	Bur oak	42	Good	Co-dominant branches
7	Cherry	12	Good	
25	Cherry	15	Fair	
26	Cherry	15	Fair	Fence line
27	Cherry	16	Fair	30 degree lean to the north
37	Cherry	16	Fair	Fungal conks and co-dominant branching
24	Cherry	18	Fair	Co-dominant scaffold limbs
28	Cherry	18	Fair	Lean to the north, fence line tree
36	Cherry	20	Fair	Fence line
23	Hackberry	11	Good	On the fence line
5	Hackberry	12	Good	
30	Hackberry	16	Good	On fence line
18	Hickory	14	Good	Suppressed by #19
56	Hickory	14	Good	
32	Hickory	15	Good	
34	Hickory	15	Good	
35	Hickory	15	Good	
60	Hickory	16	Good	
64	Hickory	16	Good	
4	Hickory	18	Good	
6	Hickory	18	Good	30% lean to the south
11	Hickory	18	Good	
12	Hickory	18	Good	
15	Hickory	18	Good	
33	Hickory	18	Good	

52	Hickory	18	Good	
55	Hickory	18	Poor	Dead and broken top
58	Hickory	18	Good	
9	Hickory	20	Good	
17	Hickory	20	Good	
31	Hickory	20	Good	
38	Hickory	20	Good	
44	Hickory	20	Good	
70	Hickory	20	Good	
40	Hickory	22	Good	
41	Hickory	22	Good	
49	Hickory	22	Fair	Dying top and split trunk
51	Hickory	22	Good	
53	Hickory	22	Good	
54	Hickory	22	Good	
62	Hickory	22	Good	
63	Hickory	22	Poor	Canker in trunk
20	Hickory	24	Good	
45	Hickory	24	Fair	With decay and dieback
59	Hickory	24	Good	
61	Hickory	26	Good	
50	White oak	32	Good	

### Cherokee Park Fifth Addition - Six Woods Inventory

ID #	Species	DBH (Inches)	Condition	Comment
1	Bur oak	31	Good	
2	Bur oak	32	Good	
3	Bur oak	32	Good	
4	Bur oak	30	Good	
5	Bur oak	30	Good	
6	Bur oak	30	Good	
7	Bur oak	32	Good	
8	Bur oak	32	Good	
9	Bur oak	20	Good	
10	Bur oak	28	Good	
11	White oak	38	Good	Co-dominant
12	Bur oak	20	Fair	Large canker on trunk
13	White oak	18	Good	
14	White oak	26	Good	
15	Bur oak	22	Good	Lean to the south
16	White oak	22	Good	
17	Bur oak	18	Good	
18	Bur oak	26	Good	
19	Bur oak	32	Good	
20	Bur oak	22	Good	
21	Bur oak	30	Good	
22	Bur oak	28	Good	
23	Bur oak	30	Good	
24	White oak	14	Good	
25	Red oak	16	Good	
26	Hickory	14	Good	
27	Bur oak	24	Good	
28	Bur oak	30	Good	
29	Bur oak	22	Good	
30	Bur oak	30	Good	
31	Bur oak	24	Good	
32	Bur oak	42	Good	Co-dominant branches
33	Bur oak	20	Good	
34	Bur oak	20	Good	
35	Bur oak	25	Good	
36	Bur oak	18	Good	
37	Bur oak	20	Fair	Tip dieback and lean to the east
38	Bur oak	28	Good	
39	Bur oak	24	Good	
40	Bur oak	20	Good	
41	Bur oak	24	Good	
42	Hackberry	16	Good	
43	Red oak	34	Poor	Canker and decay, some crown dieback
44	Bur oak	26	Good	
45	Bur oak	18	Good	
46	Bur oak	22	Good	
47	Bur oak	28	Good	
48	White oak	24	Good	
49	White oak	18	Good	

50	White oak	22	Good	
51	Bur oak	32	Fair	Some lower decay
52	Bur oak	24	Good	
53	Bur oak	24	Good	
54	Hickory	18	Good	
55	Bur oak	14	Good	Twin leader
56	Bur oak	28	Fair	Crown dieback
57	Bur oak	32	Good	
58	Bur oak	28	Good	
59	Hickory	18	Good	
60	Bur oak	20	Good	
61	Bur oak	22	Good	Co-dominant
62	Hickory	20	Good	

# MICHAEL BEST

& FRIEDRICH LLP

**Michael Best & Friedrich LLP**  
**Attorneys at Law**

One South Pinckney Street  
Suite 700  
Madison, WI 53703

P.O. Box 1806  
Madison, WI 53701-1806

Phone 608.257.3501  
Fax 608.283.2275

**William F. White**  
Direct 608.283.2246  
Email [wfwhite@michaelbest.com](mailto:wfwhite@michaelbest.com)

April 24, 2008

## HAND DELIVERED

Mr. Bradley A. Murphy  
Deputy Director  
City of Madison  
215 Martin Luther King Jr. Blvd.  
Room LL-100, Municipal Building  
Madison, WI 53703



Dear Brad:

Please find enclosed a photocopy of the Green Built Home - New Home Checklist issued by the Wisconsin Environmental Initiative. Those boxes which have been checked show the sustainable design features which will be in every home built in the Fifth Addition to Cherokee Park. To the extent that an individual homeowner may wish additional features, those will also be available, but at the homeowner's cost.

We are very pleased that Cherokee Park can take a leadership role in implementing sustainable design in this new development and urge other developers to do the same.

Please let me know if you have any questions.

Sincerely,

**MICHAEL BEST & FRIEDRICH LLP**

William F. White  
WFW:cmm

Cc: Raymon Harmon (w/enclosures) Hand Delivered  
Craig Makela (w/o enclosures)

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# NEW HOME CHECKLIST



Green Built Home™ is a national award-winning green building initiative that reviews and certifies new homes and remodeling projects that meet sustainable building and energy standards.



WISCONSIN  
ENVIRONMENTAL  
INITIATIVE

Green Built Home is implemented in partnership with the Madison Area Builders Association in cooperation with other participating builders associations, leading utilities and organizations that promote green building.

[www.greenbulthome.org](http://www.greenbulthome.org)

## Green Built Home Registration

Company Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Contact \_\_\_\_\_ Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Email \_\_\_\_\_ Web site \_\_\_\_\_

### Submittal Requirements per home

Site Address \_\_\_\_\_ City \_\_\_\_\_  
 Estimated completion date: \_\_\_\_\_

Please circle one:      **Wisconsin ENERGY STAR® Home**      **REScheck + 15% home**

- Complete Green Built Home Checklist**
- Site Plan:**
  - Provide erosion control methods and locations.
  - Indicate the limit of site disturbance.
  - Show building footprint and driveway location.
- Architectural Floor Plans:**
  - Floor plans drawn to scale and fully dimensioned.
  - Provide dimensions of roof eaves and overhangs.
- Architectural Elevations:**
  - All elevations drawn to scale.
  - Elevations shall show proposed finished elevation of floor and roofs on all levels.
- Architectural Cross Sections:**
  - Show cross section to provide internal detail to evaluate construction technique and materials used.
- Product/Materials Information:**
  - Provide a list of materials used for this project (e.g. paints, solvents, adhesives, etc.)
- Verification that the home meets Wisconsin ENERGY STAR® Homes standards (if applicable)**
- REScheck +15% documentation, including testing results (if applicable)**

### Fee Schedule

Please circle one	<b>HBA member</b>	<b>Non-HBA member</b>
<b>Home Registration Fee</b>	\$75 per home	\$100 per home
<b>TOTAL FEE:</b>	\$ _____	\$ _____
	<b>HBA member</b>	<b>Non-HBA member</b>
<b>Bulk Home Registration</b>	\$50 per home	\$75 per home

Please mail Checklist, submittals, and payment to:  
**Green Built Home**  
 16 N. Carroll St., Suite 840  
 Madison, WI 53703  
 608-280-0360  
 Fax 608-280-0361  
[www.GreenBuiltHome.org](http://www.GreenBuiltHome.org)

Builders certifying all their homes from a Green Built Specifications Checklist will be charged a reduced home registration fee. Please see page 3 of the checklist for more information on this option and contact us at 608-280-0360 for more information.

## Tired of filling out Checklists?

Upon demonstrating consistent compliance with submittal requirements and program standards, builders may elect to submit a "baseline" Green Built Specifications checklist that will qualify all homes for Green Built Home certification notwithstanding site specific or customer criteria and without the need to complete a Checklist for every home. Please contact us for more information on this option on how to certify all your homes and save time and reduce paperwork.

- Develop and sign off on one set of Green Built specifications per year
- Engage Green Built Home in an auditing process to ensure standards are met
- Certify all of your homes according to this set of specifications
- No need to fill out checklists for every home certified
- Call or e-mail us with the home's address and estimated completion date
- Fax or e-mail Wisconsin ENERGY STAR Homes or REScheck +15% documentation
- Mail \$50 home registration fee
- Certification materials will be sent to your office or your client's home

## Do you build REScheck +15% homes that consistently meet testing standards?

Upon consistently meeting air infiltration testing standards Green Built Home may, at the program's discretion, reduce the number of homes required to be tested according to established criteria. This can save you the time and expense of having all your homes tested while still maintaining program credibility. Please contact us for more information on this option.

- All homes must be certified as Green Built Homes
- All homes will be tested until at least five in a row meet the air infiltration testing standards
- Air infiltration tests must achieve results of 0.25 CFM/sq.ft. of building surface area or less for consideration of reduced testing requirements
- Homes will be randomly tested after reducing the testing requirement
- If a tested home does not meet the air infiltration standard, builders will be required to take corrective action and subsequent homes will be tested until the standard is met again.
- Homeowners will be notified if their home has not been tested.

## Quality Control

Green Built Home and/or its partners will review completed Checklists, plans, and other submissions as well as work with participating builders to verify that all Basic Requirements are met for every home entered into the program. Verification that Wisconsin ENERGY STAR Homes or REScheck +15% standards have been met will also be required for every home. Builders whose homes do not initially meet program standards will be expected to take corrective action.

Green Built Home and/or its partners will randomly inspect at least 10% of registered homes to maintain quality control and program credibility. Inspection will include a site visit, may include further testing, and may also require the builder to provide information such as: ratings certificates, spec sheets, invoices, labels, product literature and safety data sheets (MSDS) as documentation. **Builders and homeowners will also have the opportunity to request a site visit or energy testing of their registered home at any time.**

## Builder Responsibilities

Builders will certify to the homebuyer that each registered home meets the minimum standards as set forth by the Checklist by providing: 1) a signed copy of the completed Checklist or 2) a fact sheet or Green Built Specifications document that establishes that all the Basic Requirements and related green building features have been incorporated into the home. Builders will also provide the homebuyer with documentation that the home has met Wisconsin ENERGY STAR Homes standards or REScheck + 15% testing standards.

## Valuable Green Built Home Resources:

Want to learn more about "green" building practices? Have a question about a Checklist item? Looking for a particular "green" building product? Browse the **Green Built Home Interactive Checklist** located at [www.greenbuilthome.org](http://www.greenbuilthome.org) for technical details, explanations, and more information.

The Green Built Home **Buyer's Guide** is also a valuable resource. It provides a priority ranking of measures to reduce the environmental impact of home building and lets you know where you might get the best environmental result for the money.

Interested in learning more about green remodeling? Green Built Home now features information, resources and a project certification **Remodeling Checklist for do-it yourselfers and remodeling contractors** at [www.greenbuilthome.org](http://www.greenbuilthome.org).

The Green Built Home **Project Guide** outlines environmentally responsible solutions for nine common building and remodeling scenarios such as: **building a new home or addition, installing flooring, installing a new roof, painting a room, installing insulation, replacing windows, re-siding your house, remodeling a kitchen or bath, and landscaping with native plants.**

The **Green Built Home Multifamily Checklist** is now available for larger condominium, apartment and mixed use buildings.

## Qualifications:


To qualify as a Green Built Home, each home must earn a minimum of 60 points by meeting the specified criteria.

All homes must fulfill the Basic Requirements listed below and must meet the minimum point requirements in Sections B, C, D and E. The remaining points can be earned from any combination of additional checklist Sections. For homes that do not rely on conventional mechanical heating and cooling strategies, alternatives to the Wisconsin ENERGY STAR Home or REScheck+15% standards can be discussed on a case by case basis.

## GreenGuide Label:

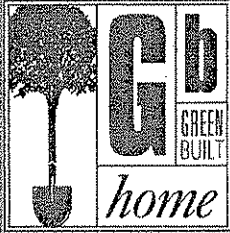
A GreenGuide Label will be provided for each home certified by the Green Built Home program. This label, similar to the yellow Energy Guide labels found on appliances, will provide the homebuyer with information on the number of points earned from the Checklist.

**Please enter the point totals for each criteria selected on the line provided and enter the subtotals as directed.**



ADDRESS \_\_\_\_\_ BUILDER \_\_\_\_\_

CONVENTIONAL HOME	↓	↓	CERTIFIED HOME 60 POINTS
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60 points are required for Green Built certification. A certified Green Built Home™ meets comprehensive energy efficiency and sustainable building requirements. Houses scoring more than 60 points have exceeded these requirements.

[www.greenbulthome.org](http://www.greenbulthome.org)

## Basic Requirements

### 1A. Wisconsin ENERGY STAR Home (10 points)

Home must comply with Wisconsin ENERGY STAR Homes program standards regarding energy efficiency, ventilation, combustion safety and indoor air quality. For information contact Wisconsin ENERGY STAR Homes at 1-800-762-7077 or visit [www.focusonenergy.com](http://www.focusonenergy.com)

OR

### 1B. REScheck +15% (1 point)

Home must be 15 percent more efficient than required by the Wisconsin Uniform Dwelling Code and demonstrate compliance using the REScheck Software (available on the Web at [www.energycodes.gov](http://www.energycodes.gov)), a HERS rating of 86, or another approved method. Builders selecting REScheck +15% must also comply with combustion safety and air tightness requirements as follows:

- Sealed or power-vented heating and water heating equipment must be installed or combustion equipment must be isolated from the conditioned space.
- Carbon monoxide detectors must be installed with a minimum of one detector per floor in any building with an attached garage or any combustion appliance within the conditioned space. Detectors can be hardwired or plug-in models.

### AIR INFILTRATION TESTING:

- A Diagnostic multi-point blower door test indicating 0.25 cfm/sq. ft. of building envelope area or less is required for all REScheck +15% homes. Builders whose homes do not initially meet the testing standard will be expected to take corrective action. Upon demonstrating consistent compliance with testing standards, the requirement for testing may be reduced at the program's discretion according to established criteria. Please contact us for more information.

### VENTILATION EQUIPMENT:

Ventilation equipment must be installed to maintain overall house ventilation. Please note that the actual, rather than rated, exhaust flows must meet the following minimums.

- Ventilation minimums:
  - Kitchen: 40 CFM vented to the outside
  - Bathroom: 20 CFM (continuous) or 50 CFM (spot) vented to the outside
- Whole house minimum:
  - One of the exhaust fans or ports (excluding kitchen) must have a minimum actual flow equal to or greater than 10 CFM plus 10 CFM per bedroom
- Ventilation system options:
  - Balanced heat or energy recovery system
  - Central exhaust system with make-up air
  - Upgrade bathroom fans

## Fireplace Safety:

- Gas fireplaces must be direct vent only with outside combustion air
- It is highly recommended that wood fireplaces have sealable, gasketed doors, and be fitted with outdoor combustion air supply

The purpose of these specifications is to reduce the potential for back-drafting of combustion byproducts into the home. Homes with high ventilation exhaust capacity, such as central vacuum systems, large capacity kitchen range hoods, clothes dryers, or multiple bathroom exhaust fans, are potentially vulnerable to back-drafting when the units are operating.

- 2. ENERGY STAR QUALIFIED APPLIANCES: (1 point)  
All appliances (clothes washer, dishwasher and refrigerator) provided are ENERGY STAR qualified or each appliance performs in the top 50% of its Energy Guide rating. If appliances are not included a list of ENERGY STAR-rated appliances is provided. For lists of ENERGY STAR rated appliances see [www.energystar.gov](http://www.energystar.gov).
- 3. EROSION CONTROL: (1 point)  
Builder must comply with the erosion control plan required for building permits by the local municipality.
- 4. RECYCLING: (1 point)  
Builder must recycle cardboard as required by state law and use at least one recycled-content material (minimum 50% recycled content). See the Interactive Checklist at [www.greenbuilthome.org](http://www.greenbuilthome.org) or call 608-280-0360 for clarification.  
List \_\_\_\_\_
- 5. TROPICAL HARDWOODS: (1 point)  
No Luan or other tropical hardwoods (plywood, doors, flooring, etc.) are allowed unless certified by Forest Stewardship Council, Smart Wood or approved "third party" organization.
- 6. PRESENT "GREEN BUILT HOMEOWNER HANDBOOK" TO HOMEOWNER: (1 point)  
This handbook will be prepared by the GBH program and provided by the builder as part of the homeowner certification folder.
- 7. PROVIDE CERTIFICATION PLAQUE AND GREEN GUIDE LABEL: (1 point)  
This wood plaque and label will be prepared by the GBH program and provided to the builder as part of the homeowner certification folder.
- 8. MERCURY THERMOSTATS: (1 point)  
No permanently installed mercury thermostats are allowed. All thermostats must be programmable set-back models with an "on" switch for furnace fan to circulate air.

### BASIC REQUIREMENTS Subtotal

8

Each registered home MUST meet all the Basic Requirements and accumulate a minimum total of 60 points.

- If the Wisconsin ENERGY STAR Homes method of energy compliance is selected, the home must include a minimum of 43 additional points from the categories listed below. The additional points must include minimum point totals for:
  - Landscape Conservation and Stormwater Management (3 points)
  - Energy Efficiency (10 points)
  - Materials Selection (6 points)
  - Indoor Air Quality (5 points)
  - Waste Reduction and Recycling (1 point)

- If the REScheck +15% method of energy compliance is selected, the home must include a minimum of 52 additional points from the categories listed below. The additional points must include minimum point totals for:
  - Landscape Conservation and Stormwater Management (3 points)
  - Energy Efficiency (10 points)
  - Materials Selection (6 points)
  - Indoor Air Quality (5 points)
  - Waste Reduction and Recycling (1 point)

Each item is valued at (1), (2), (3), (4), or (5) points. Please check all that apply and note the point totals on the line provided.

### SECTION A: SITING AND LAND USE

- 1. (1) Home built on an infill lot in an existing established neighborhood.
- 2. (3) Home Built in a brownfield (land re-use) development.
- 3. (1) Home located within 0.5 miles of a bus stop, bike route, or transit stop.
- 4. (1) Home located within 0.5 miles of shopping/offices/ retail.
- 5. (1) Home located within 0.5 miles of a school.
- 6. (1) Home located in a Traditional Neighborhood Development (TND).
- 7. (1) Home located in a conservation minded or low impact development.
- 8. (1) No garage.
- 9. (1) Patio, porch or deck located on south side of house to create sunny, wind sheltered outdoor space.
- 10. (1) Screened porch is provided to create an unconditioned, sheltered outdoor space.
- 11. (1) Home located in a Green Tier or LEED-ND certified development.
- 12. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

SECTION A Subtotal \_\_\_\_\_

### SECTION B: LANDSCAPE CONSERVATION AND STORMWATER MANAGEMENT

(At least 3 points required for all homes)

- 1. (1) Use of redundant straw bale and silt fencing in areas with steep slopes (greater than 12% grade) or areas of concentrated runoff flow.
- 2. (1) Protect on-site storm sewer inlets with straw bales, silt fencing or equivalent measures.
- 3. (1) Save and reuse all site topsoil.
- 4. (1) Trees and natural features on site protected during construction.
- 5. (1) Home placement saves east and south lot areas for outdoor use.
- 6. (1) Chip and reuse site-cleared wood and brush as mulch.
- 7. (1) Wash out concrete trucks in slab or pavement sub-base areas.  
List Location \_\_\_\_\_
- 8. (1) Balance cut and fill to eliminate earth removal from site.
- 9. (2) Replant or donate live trees from the site.
- 10. (2) Site disturbance limited to within 20 feet of structures and paved areas.
- 11. (1) Permeable materials such as brick pavers, flagstones, porous paving or limestone fines for 40% of all walkways, patios and driveways.
- 12. (1) Grass that uses less water such as blue gamma, fescue, or 'no-mow,' min. 75% of turf areas.  
List type/supplier \_\_\_\_\_
- 13. (1) Native landscape planting min. 20% of non-paved areas.  
List landscape contractor \_\_\_\_\_
- 14. (2) Native landscape planting min. 40% of non-paved areas.  
List landscape contractor \_\_\_\_\_
- 15. (3) Native landscape planting min. 60% of non-paved areas.  
List landscape contractor \_\_\_\_\_
- 16. (1) Rainwater recovery from roof for watering, min. 50 gal. storage capacity.
- 17. (3) Provide infiltration system for rooftop run off (e.g. rain gardens, drain tile, bioswales, ponds, etc.).
- 18. (1) Edible landscape planting/plan for food garden.

- 19. (1) Provide a list of native, non-invasive plants to homeowners.
- 20. (1) Limit turf grass other than 'no mow' mixes or prairies to 25% of landscaped area.
- 21. (2) No turf grass other than 'no mow' mixes or prairies.
- 22. (1) Provide information to homeowners on how to minimize fertilizer and pesticide use.
- 23. (1) Installed irrigation system includes a soil moisture or rain sensor or is a drip type system.
- 24. (1) Installed irrigation system is zoned separately for turf and bedding areas.
- 25. (2) Restore damaged ecosystem such as existing prairies or wetlands.
- 26. (1) Participate in a wildlife conservation program.
- 27. (4) Installed vegetated or "green" roof system minimum 100 sq. ft.
- 28. (1) Establish and maintain a single stabilized construction entrance.
- 29. (1) Provide on-site supervision and coordination during site clearing, grading, trenching, paving, and installation of utilities to ensure that green building measures are implemented.
- 30. (1) Use of recycled materials in lieu of silt fencing.
- 31. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**SECTION B Subtotal** \_\_\_\_\_

**SECTION C ENERGY EFFICIENCY**

(At least 10 points required for all homes)

**SITE DESIGN**

- 1. (2) Home oriented with long dimension facing within 15 degrees of south.
- 2. (1) Home massing respects solar access of adjacent properties.
- 3. (1) Garage sited between house and prevailing winter winds to act as a buffer (garage to the north or west of house).
- 4. (1) New deciduous tree(s) provided on south side or evergreens on west side of house such that when mature they will shade the house. Native species, min. 2.5" caliper @ 8" high.
- 5. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**INSULATION AND AIR SEALING**

- 6. (1) Energy heels of 7" or more on trusses.
- 7. (1) Advanced sealing package in addition to basic sealing practices (sealing at top and bottom plates, corners and between cavities at penetrations).
- 8. (2) Blower door test with 0.15 CFM/sq.ft. or less - determined at completion of home.
- 9. (3) Blower door test with 0.10 CFM/sq.ft. or less - determined at completion of home.
- 10. (1) Sill plate sealed with caulk (sill plate to foundation and rim to sill plate).
- 11. (1) Gaps between can light housings and drywall caulked.
- 12. (1) Gaps between exhaust fan housings and drywall caulked.
- 13. (1) All penetrations to the exterior are sealed both inside and outside
- 14. (2) Can lights in insulated ceilings are sealed and insulated.
- 15. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**GLAZING**

- 16. (1) Windows throughout are ENERGY STAR qualified or have a U value  $\leq 0.35$  (NFRC label).  
List manufacturer \_\_\_\_\_
- 17. (2) Windows throughout have a U value  $\leq 0.26$  (NFRC label).  
List manufacturer \_\_\_\_\_
- 18. (1) Windows throughout have an air leakage rating  $\leq 0.06$  cfm/ft.  
List manufacturer \_\_\_\_\_
- 19. (1) 25% of windows fitted with insulated window coverings.
- 20. (1) No metal frame windows in house, including basements, unless thermally broken.
- 21. (1) East facing glass NFRC label solar heat gain coefficient (SHGC) less than 0.40.  
List manufacturer \_\_\_\_\_
- 22. (1) West facing glass NFRC label solar heat gain coefficient (SHGC) less than 0.40.  
List manufacturer \_\_\_\_\_
- 23. (2) South facing glass shaded by exterior shading in May, June and July at 12 noon.
- 24. (1) Use clerestory windows for natural lighting.

- 25. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**MECHANICAL SYSTEMS**

- 26. (1) Install a 90%-94% efficiency furnace (ENERGY STAR label encouraged).  
List manufacturer & model # \_\_\_\_\_
- 27. (2) Install a 95% or higher efficiency furnace (ENERGY STAR label encouraged).  
List manufacturer & model # \_\_\_\_\_
- 28. (1) Furnace located to minimize length of total duct runs.
- 29. (1) Install a 92% or higher efficiency condensing boiler.
- 30. (2) Furnace is equipped with an electronically commutated motor (ECMs) - (variable speed motor).  
List manufacturer & model # \_\_\_\_\_
- 31. (1) High efficiency air conditioner or heat pump (ENERGY STAR qualified, SEER 14+ or COP 4.5+) if A/C provided.  
List manufacturer & model # \_\_\_\_\_
- 32. (2) No ductwork located in unconditioned space or exterior walls.
- 33. (1) Ductwork in unconditioned space or exterior walls insulated (R-13/min).
- 34. (1) Duct design complies with Manual D or equivalent.
- 35. (2) HVAC supplies and returns are fully ducted (no use of building cavities).
- 36. (1) All ductwork joints sealed (mastic or aluminum tape).
- 37. (2) Airflow for each duct run measured and balanced to within 15% of design value.
- 38. (1) High efficiency whole house fan installed with R-38 min. insulated cover.
- 39. (1) Two properly supported ceiling fans installed (ENERGY STAR label encouraged).
- 40. (1) Ceiling fan pre-wires provided in habitable rooms (min. 2 pre-wires not including bedrooms).
- 41. (2) Heat Recovery Ventilator (HRV) installed.  
List manufacturer \_\_\_\_\_
- 42. (3) Energy Recovery Ventilator (ERV) installed.  
List contractor \_\_\_\_\_

- 43. (3) Geothermal heat pump. (ENERGY STAR labeled encouraged).  
List contractor \_\_\_\_\_
- 44. (1-5) Zoned HVAC system (1 point per additional zone).
- 45. (4) No air conditioning.
- 46. (1) Whole house electricity monitoring system installed.
- 47. (1) Document proper sizing of HVAC system using Manual J or equivalent.
- 48. (1) High efficiency fireplace such as direct vent gas, Rumford, or masonry heater or no fireplace installed.
- 49. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**APPLIANCES**

- 50. (1) Provide gas rough-in for appliances.
- 51. (1) Appliances performing in top 10% of the Energy Guide rating (score one point for each appliance).  
 \_\_\_ dishwasher \_\_\_ refrigerator  
 \_\_\_ washing machine \_\_\_ microwave  
 Other: list \_\_\_\_\_
- 52. (1) Provide exterior clothesline.
- 53. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**LIGHTING AND ELECTRICAL SYSTEMS**

- 54. (1) Light-colored interior walls, ceiling and soffit. Mid tone to light color flooring/carpet (min. 75%).
- 55. (1) Install ENERGY STAR qualified light fixtures (min 4 fixtures).
- 56. (1) Furnish five compact fluorescent light bulbs to homeowner. (ENERGY STAR labeled encouraged).
- 57. (1) Compact or linear fluorescent lighting in place of incandescent down-lights.
- 58. (1) Install lighting dimmers, timers, or motion detectors (min. 4 fixtures).
- 59. (1) Motion detector activators or photocells/ timers on all exterior lighting.
- 60. (1) Solar powered walkway or outdoor area lighting (min. 6 fixtures).
- 61. (1) Solar tubes for interior daylighting.
- 62. (5) Solar electric (photovoltaic) system installed (5 pts per kW of generation capacity).  
Generation capacity \_\_\_\_\_



- 63. (2) Provide at least 400 sq.ft. of roof area that is within 15 degrees of south and tilting between 20 and 70 degrees from the horizontal for a future solar electric system. The roof area should be less than 5% shaded over an annual basis. Also install a conduit from the attic to the utility panel that is clearly labeled "future solar electric system wiring" for easy identification at a later date.
- 64. (3) No can lights in insulated ceiling.
- 65. (3) Home has an ENERGY STAR Advanced Lighting Package (ALP).
- 66. (2) LEDs used in lieu of CFLs or incandescents for general, task or accent lighting
- 67. (5) Fuel cell installed for electricity generation (5 pts per 5 kW of generation capacity).
- 68. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

### INTEGRATED CLIMATIC DESIGN

- 69. (4) Passive solar heating design package (includes orientation, south glazing/ floor area ratio, orientation specific low-e tuning, summer shading, and thermal mass design).
- 70. (4) Passive cooling design package (includes orientation, summer shading, thermal mass, attic ventilation, additional ceiling fans, heat recovery ventilation and natural ventilation design).
- 71. (5) Project is LEED certified
- 72. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

SECTION C Subtotal

30

### SECTION D: MATERIALS SELECTION

(At least 6 points required for all homes)

#### EXTERIOR

- 1. (1) Design house features to reduce materials consumption (e.g. patios in place of decks).
- 2. (1) Masonry and stone salvaged.  
List source \_\_\_\_\_
- 3. (1) Masonry and stone regionally produced (within 500 miles).  
List supplier \_\_\_\_\_
- 4. (1) Decks, site furnishings and/or other outdoor structures constructed with sustainable, low-toxicity materials: re-used wood, certified sustainable yield wood, or recycled plastic/ wood fiber composites.  
List product \_\_\_\_\_

- 5. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

#### BELOW GRADE

- 6. (1) Recycled fly ash concrete (min. 15% flyash content).  
List contractor \_\_\_\_\_
- 7. (2) Cast-in-place insulating concrete forms.
- 8. (3) Insulated pre-cast concrete foundation systems.
- 9. (2) Cast in place footing forms with integral drainage features.  
List product \_\_\_\_\_
- 10. (1) Reusable foundation forms used to reduce waste (e.g. metal rather than site built wood forms).
- 11. (1) Low toxicity form release agents used on concrete form work. *Sonnborn 'Cast-off'*  
List product \_\_\_\_\_
- 12. (1) Non-asphalt based damp proofing.  
List product \_\_\_\_\_
- 13. (1) Water based waterproofing systems.  
List product \_\_\_\_\_
- 14. (2) Frost protected shallow foundation.
- 15. (1) Reusable foundation bracing not constructed of framing lumber used.
- 16. (1) House built on 3'9" foundation walls (90% of foundation walls).
- 17. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

#### STRUCTURAL FRAME

- 18. (1) Provide weather protection for stored materials.
- 19. (1) No use of 2x10 or greater dimension solid lumber in floors or roof systems.
- 20. (1) Use prefabricated insulated headers.
- 21. (1) Engineered wood "I" joists or truss joists used for floors.
- 22. (1) Trusses or "I" joists used for roofs.
- 23. (1) Engineered lumber products for beams, joists or headers.
- 24. (1) Finger-jointed studs, engineered stud material, or plate materials.

- 25. (4 points possible) Optimum Value Engineering (O.V.E) advanced framing package (e.g. 24" O.C. studs, 3 stud corners, etc.) as developed by the NAHB. For every three strategies selected receive 1 pt:
  - frame greater than 16" centers,
  - single top plate,
  - optimized header sizes,
  - 2'-0" framing module,
  - centralized cutting areas,
  - detailed job-site framing plans,
  - two stud corners,
  - ladder backing/ drywall clips,
  - header hangers,
  - reduced cripples/ jacks,
  - optimized sheathing,
  - reduced waste factor
- 26. (3) Use of reused timber or framing lumber (min. 25% lumber usage).
- 27. (2) Use of energy efficient 2x4 exterior wall system.
- 28. (2) Use of panelized construction.
- 29. (4) Use of alternative building systems with significant environmental performance features such as SIPS, ICFs, Fasswall, Autoclaved Aerated Concrete.  
List system \_\_\_\_\_
- 30. (5) Other climate appropriate natural building system such as strawbale.  
List system \_\_\_\_\_
- 31. (2) Structural wood that is regionally grown, milled, and produced (at least 50% of wood used).
- 32. (3) Structural wood from (FSC, Smart Wood or equivalent) certified sustainably managed forests (at least 50% of wood used).
- 33. (1) Advanced rim joist insulation (prefabricated insulated rim joist, spray foam insulation, or other similar technique).
- 34. (1) Recycled content steel framing with adequate thermal break used instead of wood
- 35. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**ENVELOPE, WALLS AND CEILING**

- 36. (1) Large roof overhangs to extend life of siding finishes: 24" horizontal projection min.
- 37. (1) Use of non-sealed insulating glazing or sash designs that allow for insulated glazing unit replacement without requiring sash replacement.
- 38. (1) Fiber-cement or wood composite siding (min. 50% of siding used).
- 39. (2) Recycled content sheathing (min. 50% pre- or post-consumer recycled content).  
List product \_\_\_\_\_

- 40. (1) Recycled content siding (min. 50% pre-consumer).  
List product \_\_\_\_\_
- 41. (2) Recycled content siding (min. 50% post-consumer).  
List product \_\_\_\_\_
- 42. (1) Recycled content fascia, soffit, or trim (min. 50% pre-consumer).  
List product \_\_\_\_\_
- 43. (2) Recycled content fascia, soffit, or trim (min. 50% post-consumer).  
List product \_\_\_\_\_
- 44. (1) Metal siding with long-life factory finish. (min. 25% of siding used)
- 45. (1) Natural cementitious stucco.
- 46. (2) Continuous drainage plane behind siding.
- 47. (3) Vented rain screen behind siding.
- 48. (2) Drywall with at least 90% recycled-content gypsum.  
List product \_\_\_\_\_
- 49. (1) High strength 1/2-inch drywall substituted for 5/8 drywall on ceilings.  
List product \_\_\_\_\_
- 50. (3) Plywood, OSB or other sheathing from (FSC, Smart Wood or equivalent) certified sustainably managed forests (at least 50% of sheathing used).
- 51. (2) No vinyl siding, soffit, fascia, trim, or windows.
- 52. (1) Factory finished wood, fiber cement, or composite siding.
- 53. (1) Siding and exterior trim primed on all sides.
- 54. (1) Brick or stone siding on 75% or more of the home's exterior.
- 55. (1) Flexible, self adhering rubber flashing installed around all windows and integrated with drainage plane.
- 56. (1) Insulated sheathing used.
- 57. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**INSULATION**

- 58. (1) Recycled content insulation (min. 25% recycled content and min. 50% of insulation).  
List product \_\_\_\_\_
- 59. (2) Blown/sprayed-in insulation used at walls.
- 60. (3) Natural insulation (cotton, bio-based foam, etc) used (min. 50% of insulation).
- 61. (1) Below slab insulation installed.

- 62. (1) Exterior foundation walls insulated with min. 1" of foam insulation.
- 63. (2) Exterior foundation walls insulated with min. 2" of foam insulation.
- 64. (1) Variable permeance or "smart" vapor retarder installed.
- 65. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**ROOF**

- 66. (1) Recycled content roofing material (min. 25% recycled content).  
List product \_\_\_\_\_
- 67. (2) Minimum 40-year roofing material including asphalt, concrete, slate, clay, composition, metal, rubber or fiberglass.
- 68. (3) Minimum 50-year roofing material including asphalt, concrete, slate, clay, composition, metal, rubber or fiberglass.
- 69. (3) Plywood, OSB, or other roof decking from (FSC, Smartwood or equivalent) certified sustainably managed forests (at least 50% of decking used).
- 70. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**SUB-FLOOR**

- 71. (1) Recycled content underlayment (100% of underlayment used).  
List product \_\_\_\_\_
- 72. (3) Plywood or other subfloor from (FSC, Smart Wood or equivalent) certified sustainably managed forests.
- 73. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**FINISH FLOOR**

- 74. (1) Bamboo flooring (min. 100 sq.ft).
- 75. (1) Cork flooring (min. 100 sq. ft.).
- 76. (2) Flooring made from reclaimed (recycled) wood (min. 50% of wood flooring).
- 77. (2) Recycled content ceramic tile (min. 50% of tile used).
- 78. (2) Salvaged stone or masonry flooring.
- 79. (1) Recycled content carpet pad (100% of pad used).
- 80. (1) Recycled content carpet — tacked not glued (min. 50% of carpet used).

- 81. (2) Carpet provided by a company that agrees to take it back for recycling at the end of its useful life.
- 82. (3) Flooring from (FSC, Smart Wood or equivalent) certified sustainably managed forests (min. 50% of wood flooring).
- 83. (2) No vinyl flooring or base trim.
- 84. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**DOORS, CABINETS AND TRIM**

- 85. (1) Recycled content doors or MDF.  
List manufacturer \_\_\_\_\_
- 86. (1) Domestically grown interior wood panel doors.
- 87. (1) Finger jointed trim or MDF (min. 75% of trim stock).
- 88. (1) Domestic hardwood trim (min. 75% of trim stock).
- 89. (1) Recycled content countertops (e.g. Environ, Richlite).
- 90. (1) Concrete, regionally produced, or regionally quarried countertops.
- 91. (2) Use of reused hardwood trim, cabinets, and/or doors (min. 25% of stock).
- 92. (3) Hardwood trim from (FSC, Smart Wood or equivalent) certified sustainably managed forests (min. 50% of wood trim).
- 93. (3) Finish grade plywood from (FSC, Smart Wood or equivalent) certified sustainably managed forests (min. 50% of finish plywood).
- 94. (2) Wheat or strawboard materials used in place of particleboard.
- 95. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**SECTION D Subtotal**

31

**SECTION E: INDOOR AIR QUALITY**

- (At least 5 points required for all homes)
- 1. (1) Take measures to avoid air pollution or IAQ problems due to construction dust.
  - 2. (2) Garage physically separated from house.
  - 3. Measures taken to reduce carbon monoxide infiltration using one of the following four methods (maximum of one point).
    - \_\_\_ continuous air barrier separation
    - \_\_\_ weather-sealed door
    - \_\_\_ exhaust fan in garage on timer or wired to door opener
    - \_\_\_ garage ventilated to neutral pressure

- 4. (1) Foundation drainage system tied to sealed sump pit for potential radon mitigation.
- 5. (1) Locked, vented chemical storage cabinet provided outside of living space.
- 6. (1) Operable windows on two walls for rooms with two exterior wall surfaces.
- 7. (1) High efficiency media air cleaner such as April Aire 2200/2250/2400.
- 8. (1) Furnace and /or duct mounted electronic air cleaner such as April Aire 5000.
- 9. (1) Furnace and /or duct mounted HEPA filter.
- 10. (1) All ductwork joints sealed with water based, low V.O.C. mastic (< 30g/l) or metalized tape.
- 11. (2) Hydronic heating system (serving min. 75% of conditioned space).
- 12. (1) Central vacuum system vented to the exterior (excludes garage).
- 13. (1) ENERGY STAR qualified residential ventilating (bath) fans used.  
List manufacturer & model # \_\_\_\_\_
- 14. (4) House meets American Lung Association Health House standards.
- 15. (1) Automatic tub/shower room fan controls such as timers or humidistats.
- 16. (1) Bath fans installed with smooth ducting and short, straight runs.
- 17. (1) Spring loaded, weather stripped fan dampers installed.
- 18. (2) Whole house dehumidification system installed.
- 19. (1) Free-standing, high efficiency, high capacity dehumidifier with built-in heater.
- 20. (1) Use non-toxic cleaners.
- 21. (1) Ventilate the home after each new finish is applied.
- 22. (1) Clean ducts and furnace thoroughly just before the homeowner moves in.
- 23. (1) Washed stone installed under basement slab for potential radon mitigation.
- 24. (1) Rough-in venting provided for potential radon mitigation.
- 25. (1) UV light in supply duct.
- 26. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**IAQ MATERIALS**

- 27. (2) Formaldehyde-free insulation.
- 28. (1) GreenGuard or equivalent certified low formaldehyde insulation.

- 29. (1) Batt insulation that is encapsulated or otherwise non-irritating.
- 30. (2) Non-toxic spray foam insulation.
- 31. (1) Urea formaldehyde-free sub-floor and underlayment material.  
List product \_\_\_\_\_
- 32. (2) Use of hard surface floors such as wood, concrete, tile or linoleum (min. 50% of floor area).
- 33. (3) Use of hard surface floors such as wood, concrete, tile or linoleum (min. 90% of floor area).
- 34. (2) Natural linoleum with low toxic adhesives and backing in place of all vinyl flooring.
- 35. (2) Natural material carpet (wool, sisal, etc) - tacked not glued (100% of carpet used).
- 36. (1) Natural material carpet padding (natural rubber, wool, 100% of padding used).
- 37. (1) Carpet and Rug Institute Green Label IAQ label on all carpet used.
- 38. (2) Carpet and Rug Institute Green Label +Plus IAQ label on all carpet used.
- 39. (1) Hardboard content doors with MDI or non-toxic binders.  
List supplier/product \_\_\_\_\_
- 40. (1) All cabinets, shelves, and countertops made with formaldehyde free materials: solid wood, formaldehyde free particleboard or MDF (medium density fiberboard), metal with natural or baked enamel factory finish.  
List supplier/product \_\_\_\_\_
- 41. (1) All exposed particleboard containing formaldehyde sealed with non-toxic sealer.
- 42. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**IAQ FINISHES AND ADHESIVES**

- 43. Low V.O.C paints (<150 g/l) used throughout.  
**One point each:**  
 \_\_\_ interior primer,  
 \_\_\_ interior finish,  
 \_\_\_ exterior primer,  
 \_\_\_ exterior finish  
 List supplier/product \_\_\_\_\_
- 44. Non-toxic zero V.O.C. paints used throughout (AFM Safecoat or equivalent). **Two points each:**  
 \_\_\_ interior primer,  
 \_\_\_ interior finish,  
 \_\_\_ exterior primer,  
 \_\_\_ exterior finish  
 List supplier/product \_\_\_\_\_

- 45. Water based, "low V.O.C." adhesives used throughout.  
**One point each:**  
 construction adhesive,  
 cove base adhesive,  
 PVC adhesive,  
 thinset mortar,  
 other  
 List supplier/product \_\_\_\_\_

- 46. (1) Water-based urethane finishes on wood floors.
- 47. (1) Water-based finishes on woodwork.
- 48. (1) Supply workers with V.O.C. safe masks if using high V.O.C. materials.
- 49. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**SECTION E Subtotal** 7

**SECTION F: PLUMBING AND WATER CONSERVATION**

- 1. (1) Front loading, horizontal axis clothes washer.
- 2. (1) Select bathroom faucets with GPM less than code or install low-flow aerators.
- 3. (1) Select kitchen faucets with GPM less than code or install low-flow aerators.
- 4. (1) Select showerheads with GPM less than code or install low-flow aerators.
- 5. (1) Manifold plumbing system with PEX tubing.
- 6. (2) Composting toilet.
- 7. (2) Rough-in for future greywater recovery system.
- 8. (4) Greywater recovery system installed.
- 9. (1) No garbage disposal.
- 10. (2) No PVC piping for drains, wastes and vents.
- 11. (1) All showers are equipped with only one showerhead.
- 12. (1) Dual flush or ultra low flow toilet with GPF less than code.
- 13. (1) Passive or loop hot water delivery system installed at the farthest location from hot water heater (lines must be insulated).
- 14. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**WATER HEATING**

- 15. (3) Gas water heater with energy factor of more than .62 for direct vented.  
List manufacturer & model # \_\_\_\_\_
- 16. (3) High efficiency central domestic hot water heating system.

- 17. (2) No use of electric domestic hot water heating equipment.
- 18. (1) Water heater within 20 pipe feet of dishwasher and clothes washer.
- 19. (1) All other fixtures within 20 pipe feet of water heater or provide heat trap.
- 20. (2) Insulate all hot water lines to minimum R-4.
- 21. (1) Insulate hot and cold water pipes 3 feet from the hot water heater.
- 22. (3) On-demand (tankless) hot water delivery system.  
List manufacturer & model # \_\_\_\_\_
- 23. (1) Water heater heat pump.  
List manufacturer & model # \_\_\_\_\_
- 24. (3) Drain water heat recovery unit installed.
- 25. (2) Combined high efficiency domestic hot water/ space heating system.
- 26. (2) Provide south roof area for future solar domestic hot water heating system (min. 300 sq. ft. within 15 degrees of south with the panels 20-60 degrees from the horizontal) and plumbing rough-in for solar water heating system (separate cold water supply plumbed to roof and hot water return plumbed to water heater).
- 27. (4) Active solar domestic hot water heating system installed (Min. 50% of water heating load).
- 28. (1) Water heater timer installed.
- 29. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

**SECTION F Subtotal** 17

**SECTION G: WASTE REDUCTION, RECYCLING AND DISPOSAL**

(At least 1 point for all homes in addition to items required by state law)

- 1. (1) Posted job site recycling plan.
  - 2. Recycle or reuse job site waste, **1 point for each material:**
    - glass, aluminum cans and plastic bottles (required by state law, no point)
    - cardboard (required by state law, no point)
      - \_\_\_ asphalt roofing (75% landfill diversion)
      - \_\_\_ wood scraps (75% landfill diversion)
      - \_\_\_ pallets (75% landfill diversion)
      - \_\_\_ metal (75% landfill diversion)
      - \_\_\_ gypsum wall board (75% landfill diversion)
      - \_\_\_ brick and block (75% landfill diversion)
      - \_\_\_ other
- List: \_\_\_\_\_

7-8

- 3. (1) Obtain products from suppliers that use recyclable or reusable packaging or arrange to take back their packaging.  
List supplier(s) \_\_\_\_\_
- 4. (1) Reuse or recycle asphalt or concrete rubble.
- 5. (2) Require subcontractors (contract language) to participate in waste reduction and recycling efforts.
- 6. (1) Dispose of non-recyclable hazardous wastes at legally permitted facility.  
List waste: \_\_\_\_\_
- 7. (1) Install garage recycling center for homeowner use.
- 8. (1) Built-in kitchen recycling center to include two or more bins.
- 9. (1) Provide kitchen scrap compost bin.
- 10. (2) Track and prominently post waste reduction results on site.
- 11. (1) On site grinding of wood construction debris.
- 12. (1) Document substantial design strategies to reduce waste from construction.
- 13. (2) Design for disassembly, reuse, and recyclability.
- 14. (1) Donate excess materials to a non-profit organization or charity.
- 15. (5) Disassemble existing buildings and reuse or recycle the building materials (deconstruction) instead of demolishing. (at least 75% landfill diversion).
- 16. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

SECTION G Subtotal 4

### SECTION H: BUILDER OPERATIONS

- 1. (1) At least 80% of homes built to Green Built Home standards annually.
- 2. (1) At least one recent action taken to visibly market Green Built Home program.  
List action, location, and date \_\_\_\_\_
- 3. (1) Conduct homebuyer orientation during final walk-through (point out Green Built features, how to maintain them, operate them, etc).
- 4. (1) At least one recent training event conducted for realtors or sales staff.
- 5. (3) Provide homebuyer with guaranteed energy bills at least 25% below the average of that for a typical new home of the same square footage and features.
- 6. (1) Builder attendance at one recent green building related educational event.  
List event, sponsor, and date: \_\_\_\_\_

- 7. (1-3) Builders own idea for innovation, education, and encouraging homeowners to take care of their home in an environmentally friendly way (Ex. Provide homeowners with environmentally friendly cleaning products).  
List idea: \_\_\_\_\_
- 8. (1) Establish a "Green Team." Identify employees and/or subcontractors, their roles and how they relate to various phases of green development and building.
- 9. (1) Create and implement an integrated design process to increase communication between the owner, design team, general contractor, subcontractors, the city's building department and other stakeholders.
- 10. (1) Provide homeowner with information and enrollment materials for the local utility's renewable energy program.
- 11. (2) Provide the buyer with the first year enrollment costs of 100% of electricity provided by the local utility's renewable energy program.
- 12. (1-5) Use suppliers whose operations and business practices include environmental management system concepts (the product, plant, or company must be ISO 14001 or equivalent certified). 1 point per supplier, min. 50% of purchased material coming from each supplier.  
List supplier/product \_\_\_\_\_
- 13. (1) Use products that are Cradle to Cradle Certified. (1 point per product.)  
List products \_\_\_\_\_
- 14. (3) Builder's own operations and business practices include environmental management system concepts (the builder must be Green Tier, ISO 14001 or equivalent certified).
- 15. (5) Perform and review a life cycle assessment (LCA) to compare the environmental effects of building materials and home designs.
- 16. (3) Building systems commissioning conducted.
- 17. (1) Homeowner provided with an operations and maintenance manual.
- 18. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach \_\_\_\_\_

SECTION H Subtotal 4

### SECTION I: EFFICIENT USE OF SPACE

- 1. (1) Above Grade finished and conditioned space 2500-2250 sq.ft.
- 2. (2) Above Grade finished and conditioned space 2249-2000 sq.ft.
- 3. (3) Above Grade finished and conditioned space 1999-1750 sq.ft.

- 4. (4) Above Grade finished and conditioned space 1749-1500 sq.ft
- 5. (5) Above Grade finished and conditioned space <1500 sq.ft.
- 6. (1) Lot size less than 7,500 sq.ft.
- 7. (1) Provide an accessory dwelling unit (garage apartment, granny flat, etc.)
- 8. (2) Home designed for flexibility to allow for changing uses in the future (rough-ins for future bathrooms, finish flooring runs under partitions, reconfigurable spaces, etc.)
- 9. (2) Home utilizes incremental design techniques with documented provisions to expand to meet future growing needs (roof trusses designed for additions, room layouts configured for additions, etc.)
- 10. (1) Living space provided in a finished basement.
- 11. (1) Living space provided in a finished attic.
- 12. (1) Bonus room provided over garage.
- 13. (1) Home is a unit in a co-housing development.
- 14. (1) Home shares a common driveway with at least one other building.
- 15. (1-5) Utilize an approach not listed that meets the goals of this section.  
List approach: \_\_\_\_\_

SECTION I Subtotal 2

Basic Requirements subtotal 8

SECTION A Subtotal 0

SECTION B Subtotal 11

SECTION C Subtotal 30

SECTION D Subtotal 31

SECTION E Subtotal 8

SECTION F Subtotal 9

SECTION G Subtotal 4

SECTION H Subtotal 4

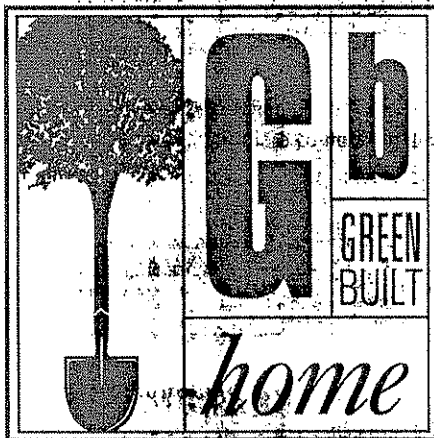
SECTION I Subtotal 2

TOTAL 107

I certify that the preceding information is complete and accurate and that all requirements for Green Built Home certification have been met or exceeded.

BUILDER'S SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_



WISCONSIN ENVIRONMENTAL INITIATIVE

16 N. Carroll St. Suite 840  
 Madison, WI 53703  
 Phone: 608-280-0360  
 Fax: 608-280-0361  
 E-mail: contact@greenbuilthome.org  
 Web site: www.greenbuilthome.org

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INITIATIVE



Green Built Home was founded in 1999 by Wisconsin Environmental Initiative  
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Green Built Home is administered throughout the state of Wisconsin  
and reaches thousands of homebuyers and builders through our collaborations with  
Builders Associations and other affiliated organizations.