



# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Meeting Agenda Board of Aldermen



---

Tuesday, April 16, 2019

7:00 PM

Board Chambers - Room 110

---

### 7:00-7:05

#### A. POETRY READING, RESOLUTIONS, PROCLAMATIONS & ACKNOWLEDGEMENTS

### 7:05-7:10

#### B. ANNOUNCEMENT OF UPCOMING MEETINGS

### 7:10-7:15

#### C. REQUESTS FROM VISITORS AND SPEAKERS FROM THE FLOOR

### 7:15-7:20

#### D. CONSENT AGENDA

1. [19-142](#) Approval of March 26, 2019 Meeting Minutes
2. [19-97](#) Authorization to Renew Lease Agreement for Community School for People Under Six  
**PURPOSE:** Community School for People Under Six (CSPU6) has expressed interest in renewing their lease agreement for the Town's property on Hargraves Street in Carrboro. The Board of Aldermen is requested to adopt the attached resolution authorizing the Town Manager to execute the lease agreement.  
**Attachments:** [Attachment A - Resolution](#)  
[Attachment B - Draft CSPUS - Lease Agreement 2019v3](#)  
[Attachment C -CSPU6 2019 Update](#)
3. [19-141](#) Request-to-Set a Public Hearing on a Land Use Ordinance Amendment Regarding Buildings for Civic Assembly in Village Mixed-Use Developments  
**PURPOSE:** The purpose of this agenda item is for the Board of Aldermen to consider setting a public hearing on a text amendment to the Land Use Ordinance regarding buildings for civic assembly in village mixed-use developments.

**Attachments:** [Attachment A - Resolution](#)  
[Attachment B - Text Amendment Request](#)

## E. OTHER MATTERS

### 7:20-7:40

1. [19-140](#) Request to Make Appointments to the Economic Sustainability Commission  
**PURPOSE:** The purpose of this agenda item is for the Board of Aldermen to make appointments to the Economic Sustainability Commission

**Attachments:** [Attachment A - Appointment Resolution](#)  
[Attachment B - 2019 Economic Sustainability Commission Information Matrix](#)  
[Attachment C - Chair Forms and Applications](#)

### 7:40-8:00

2. [19-137](#) Consideration of a Funding Request from the Orange County Veterans Memorial Committee

**PURPOSE:** The purpose of this agenda item is to consider a funding request of \$25,000 to support the construction of the Orange County Veterans Memorial.

**Attachments:** [Attachment A - Resolution](#)  
[Attachment B - Request and Project Information](#)

### 8:00-8:20

3. [19-139](#) Tourism Development Authority's Annual Report to the Board of Aldermen  
**PURPOSE:** The purpose of this agenda item is to update the Board on the activities of the TDA this past year and to gather input for the upcoming FY 2019-20 budget process.

**Attachments:** [Attachment 1 - CTDAReport 2018-19](#)

### 8:20-8:40

4. [19-143](#) Review and Acceptance of the 2019 Annual Report on the Schools Adequate Public Facilities Ordinance (SAPFO) from the Technical Advisory Committee  
**PURPOSE:** The Orange County Board of County Commissioners has referred the 2019 report for review. The Board of Commissioners has requested comments from partner local governments by April 22nd. A resolution that accepts the report

has been attached. The Board may choose to attach comments if desired.

**Attachments:** [Attachment A - Resolution](#)  
[Attachment B - Letter and Executive Summary](#)  
[Attachment C - Draft-SAPFOTAC-Report](#)  
[Attachment D - LUO Sec 15-88-15-88.7 and MOU](#)  
[Attachment E - Memo on CAPS](#)

### **8:40-9:00**

**5. [19-144](#)**

Discussion and Request to set a Public Hearing on Land Use Ordinance Amendments Related to Stormwater Management

**PURPOSE:** The purpose of this agenda item is for the Board of Aldermen to discuss options related to post-development rate of discharge stormwater requirements and consider setting a public hearing on an ordinance amending stormwater volume control provisions.

**Attachments:** [Attachment A - Resolution](#)  
[Attachment B - NOAA Atlas 14 Carrboro](#)  
[Attachment C - Lopez-Cantu and Samaras , Environ. Res. Lett. 13 \(2018\) 074006](#)  
[Attachment D - LUO Amendment - Volume Control 4-11-2019](#)  
[Attachment E - Section 15-263 Stormwater Volume](#)

**F. MATTERS BY BOARD MEMBERS**

**G. CLOSED SESSION PURSUANT TO NCGS 143-318.11 (A) (3) - Attorney-Client P Privilege**



# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number:**19-142

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

Approval of March 26, 2019 Meeting Minutes





# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number: 19-97**

---

**Agenda Date:** 4/16/2019

**File Type:** Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

### **TITLE:**

Authorization to Renew Lease Agreement for Community School for People Under Six

**PURPOSE:** Community School for People Under Six (CSPU6) has expressed interest in renewing their lease agreement for the Town's property on Hargraves Street in Carrboro. The Board of Aldermen is requested to adopt the attached resolution authorizing the Town Manager to execute the lease agreement.

**DEPARTMENT:** Manager's Office, Town Attorney

**CONTACT INFORMATION:** Rebecca Buzzard, 919-918-7438, Bob Hornik, 919-929-3905

**INFORMATION:** The Community School for People Under Six's mission is "to provide high quality early care and education for all children, specifically low and middle income families; while providing advanced educational opportunities for teachers." <http://cspu6.org/>  
An update on their activities can be found in Attachment C.

The current lease will expire in August 2019 and staff has been working with the applicant to negotiate a lease renewal. The proposed lease has been reviewed by the Town Attorney. N.C. G.S. 160A-272 requires Board approval of contracts leasing or renting town property. The proposed lease with CSPU6 is for ten years. An additional requirement for such leases is that the Town provide public notice of the intent to enter into such a lease agreement. A notice was published March 10th, 2019 in The Durham Herald Sun.

**FISCAL & STAFF IMPACT:** The contract stipulates an annual payment to the Town of \$1.00 per year for ten years.

**RECOMMENDATION:** Town staff recommends that the Board adopt the attached resolution authorizing the Town Manager to execute a renewal lease agreement with CSPU6.

**A RESOLUTION AUTHORIZING THE TOWN MANAGER TO EXECUTE  
A RENEWAL LEASE AGREEMENT WITH THE  
COMMUNITY SCHOOL FOR PEOPLE UNDER SIX**

WHEREAS, the Town of Carrboro entered into a lease agreement on August 18, 2009 with the Community School for People under Six; and

WHEREAS, the Community School for People under Six, located at 102 Hargraves Street in Carrboro, has a mission “to provide high quality early care and education for all children, specifically low and middle income families;” and

WHEREAS, the Town of Carrboro leased Town-owned facilities on Hargraves Street in Carrboro to the Community School for People under Six for a period of ten years and a rate of \$1.00 per year; and

WHEREAS, this lease agreement is scheduled to end August 18, 2019, and Town staff has been working to negotiate a lease which has been reviewed by the Town Attorney; and

WHEREAS, N.C. G.S. 160A-272 requires the Town provide 30-day public notice of the intent to enter into a lease agreement, and the Town issued a public notice on March 10, 2019 in The Durham Herald Sun; and

WHEREAS, N.C. G.S. 160A-272 requires Board of Aldermen approval of contracts leasing or renting town property; and

WHEREAS, the Town of Carrboro proposes to renew its lease with the Community School for People under Six for a period of ten years at a rate of \$1.00 per year;

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF ALDERMEN OF THE TOWN OF CARRBORO:**

Section 1. Authorizes the Town Manager to execute a renewal lease agreement with the Community School for People under Six.

Section 2. This resolution shall become effective upon adoption.

NORTH CAROLINA  
ORANGE COUNTY

**LEASE AGREEMENT**

THIS LEASE AGREEMENT, made and entered into the \_\_\_\_ day of \_\_\_\_\_, 2019 by and between the TOWN OF CARRBORO, a North Carolina Municipal Corporation, 301 W. Main Street, Carrboro, North Carolina, 27510, hereinafter referred to as the "Town" and the COMMUNITY SCHOOL FOR PEOPLE UNDER SIX, 102 Hargraves Street, Carrboro, North Carolina, 27510, hereinafter referred to as "CSPU6."

**WITNESSETH:**

WHEREAS the Town acquired a modular unit for three (3) classrooms and other facilities, hereinafter referred to as "Facilities," at a site owned by the Town on Hargraves Street in Carrboro, North Carolina, hereinafter referred to as "Leased Premises;" and

WHEREAS, the Town has agreed to allow CSPU6 to use the Leased Premises pursuant to this Lease Agreement;

NOW, THEREFORE, in consideration of the mutual covenants and agreements set forth herein, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

**1. Lease of Premises**

The Town hereby leases to CSPU6 that certain property owned by the Town located at 102 Hargraves Street, Carrboro, North Carolina 27510, for the purpose of using an existing modular unit for three (3) classrooms and other facilities (the "Facilities"), upon the Leased Premises. CSPU6 accepts the Leased Premises and the Facilities in "as is" condition.

Attached hereto as Exhibit "A" and incorporated herein by reference is a schematic plan of the Facilities (hereinafter referred to as the "Floor Plan").

**2. Rent**

The Town agrees to rent the Leased Premises to CSPU6 for the sum of One Dollar (\$1.00) per year.

**3. Term of Lease**

The term of this Lease shall be for ten years (10), commencing on August 18, 2019 and ending on August 18, 2029, unless terminated sooner in accordance with the provisions below. CSPU6 reserves the right to terminate this Lease upon at least sixty (60) days notice to the Town.

Oral notice of termination or oral discussion of same has no validity under this Lease. ALL NOTICES MUST BE WRITTEN.

#### **4. Surrender of Lease Premises**

At the expiration of the Lease term, or upon earlier termination as allowed, CSPU6 shall surrender the Leased Premises in as good condition as it was in at the beginning of the Lease term, reasonable wear and tear and damages by the elements excepted.

#### **5. Duties of CSPU6**

- a. CSPU6 shall provide all routine janitorial services at its own expense for the Facilities. Provision for contract janitorial service shall include worker's compensation insurance, general liability insurance and employee bonds.
- b. CSPU6 shall provide for the Facilities and at its expense for its own use the following utilities: gas, water, sanitary sewer, solid waste collection (including recycling), electricity, telephone and cable service, if desired. CSPU6 shall also be responsible for the maintenance and upkeep of its equipment and personal property located upon the Leased Premises and outside of the Facilities, i.e., playground and playground equipment.
- c. CSPU6 shall be responsible for the cost of all routine maintenance and repairs to both the interior and exterior of the Facilities, including public water and sanitary sewer lines to the extent such routine maintenance and repairs is not the responsibility of OWASA or any other public utility. CSPU6 reserves the right to bill the Town for extraordinary maintenance resulting from the activities and/or neglect of Town employees.
- d. CSPU6 shall ensure that the Leased Premises are maintained and operated in a safe and sanitary manner. CSPU6 shall leave the Facilities in a safe and sanitary condition following CSPU6's use of said Facilities. CSPU6 shall also be responsible for proper safekeeping and security of the Facilities.
- e. CSPU shall comply with all applicable statutes, regulations and codes relating to occupancy by a certain number of persons, building code provisions for kitchens, fire regulations, and provisions governing food preparation and handling. CSPU6 shall take reasonable precautions to prevent damage to the Leased Premises and/or Facilities from fire or other causes and to prevent bodily and personal injury.
- f. CSPU6 shall seek the Town's prior written approval before making any structural changes the Leased Premises and/or Facilities. The Town shall inform CSPU6 of any intended structural changes to be made to the Leased Premises and/or Facilities prior to making said changes.

#### **6. Duties of the Town**

- a. The Town shall provide all routine grounds maintenance for the Leased Premises at its own expense, including the parking lot and basketball courts, except that portion of the Leased Premises upon which CSPU6 maintains its equipment and personal property outside of the Facilities, i.e., playground and playground equipment -which area and equipment shall be maintained by CSPU6. Provision for contract

grounds maintenance service shall include worker's compensation insurance, general liability insurance and employee bonds.

## **7. Insurance**

To the extent permitted by law, CSPU6 shall provide at its expense liability insurance, for bodily injury, personal injury, contractual liability and property damage, naming the Town as an additional insured, covering its activities on the Leased Premises and/or Facilities, and any other insurance required by law or the Town, which insurance policy shall name the Town as an "additional insured". Copies of said insurance policies or Certificates of Insurance shall be filed in the Town Purchasing Office. Said insurance shall provide that the Town shall be given at least thirty (30) days prior written notice before the policy may be altered, amended, canceled, or terminated or allowed to lapse.

To the extent permitted by law, the Town shall provide at its expense liability insurance, for bodily injury, personal injury, contractual liability and property damage, naming CSPU6 as an additional insured, covering its activities on the Leased Premises and/or Facilities, and any other insurance required by law or CSPU6. Copies of said insurance policies or Certificates of Insurance shall be filed at the CSPU6 Director's office at 102 Hargraves Street, Carrboro, North Carolina. Said insurance shall provide that CSPU6 shall be given at least thirty (30) days prior written notice before the policy may be altered, amended, canceled, or terminated or allowed to lapse.

## **8. Waiver of Subrogation**

The Town agrees to maintain fire, extended coverage, and vandalism and malicious mischief insurance on the Leased Premises and on personal property of the Town contained therein to the extent of its full insurable value. CSPU6 shall do the same with respect to its property located in or on the Leased Premises. CSPU6 hereby mutually releases and discharges the Town from all claims or liabilities arising from or caused by fire or other casualty covered by its insurance on the Leased Premises, or property in or on the Leased Premises. The Town hereby mutually releases and discharges CSPU6 from all claims or liabilities arising from or caused by fire or other casualty covered in its insurance on the Leased Premises, or property in or on the Leased Premises.

## **9. Sublease or Assignment**

This Lease Agreement may not be assigned or transferred, nor may any of the Leased Premises and/or Facilities be sublet, without the prior written approval of both parties.

## **10. Alterations, Repairs**

The Town reserves the right to approve and/or make alterations, renovations, or repairs to the Leased Premises. CSPU6 may make alterations, renovations, or repairs to the Facilities but only with the Town's written approval, and such approval shall not be unreasonably withheld.

## **11. Right of Inspection**

The Town reserves the right to enter the Leased Premises and inspect the Leased Premises, or to repair and maintain the Leased Premises, upon reasonable notice.

**12. Personal Injury or Property Damage**

CSPU6 shall, to the extent allowed by law, indemnify and hold harmless and defend the Town, its agents and employees from any claims, cost, expense, liability, action, or judgment including attorney's fees arising out of or related to any personal injury, death or property damage with respect to its use of the Leased Premises for operation of the CSPU6 program for preschoolers, except to the extent same are caused by the negligence or misconduct of the Town.

**13. Amendment of Lease**

This Lease may be modified or amended by written agreement of the parties.

**14. Damage to Leased Premises**

In the event the Leased Premises and/or Facilities shall be damaged so as to render it untenable, this Lease Agreement shall terminate.

**15. Default**

In the event CSPU6 shall default under any of its obligations and fails to remedy default within reasonable time after notice from the Town, the Town may declare this Lease terminated and reenter Leased Premises to take possession and terminate the Lease. In the event the Town shall default under any of its obligations and fails to remedy default within reasonable time after notice from CSPU6, CSPU6 may declare this Lease terminated and reenter the Facilities to take possession and terminate the Lease.

**16. Notice**

Any notice or written communication related to this Lease shall be deemed effective if mailed or delivered to:

1. For the Town:

David Andrews, Town Manager  
Town of Carrboro  
301 W. Main Street  
Carrboro, NC 27510

2. For CSPU6:

Anna McClain, Director  
CSPU6  
102 Hargraves Street  
Carrboro, NC 27510

with copies to:

Annette Stone, Director  
Economic & Community Development  
Town of Carrboro  
301 W. Main Street  
Carrboro, NC 27510

or such other place as the parties may be directed.

IN WITNESS WHEREOF, the parties hereunto cause this Lease Agreement to be executed in their respective names.

This the \_\_\_ day of \_\_\_\_\_, 2019.

TOWN OF CARRBORO  
A Municipal Corporation

COMMUNITYSCHOOL FOR  
PEOPLE UNDER 6

By: \_\_\_\_\_  
Town Manager

\_\_\_\_\_  
Director, CSPU6

Attest: \_\_\_\_\_  
Town Clerk

Attest: \_\_\_\_\_

**COMMUNITY SCHOOL FOR PEOPLE UNDER SIX  
2019 UPDATE**

Community School for People under Six (CSPU6) is a 5-star North Carolina licensed child care center. Formerly displaced from 400 Caldwell Street, Chapel Hill with the construction of the then new Northside Elementary School, CSPU6 leased its current location at 102 Hargraves Street, Carrboro from the Town of Carrboro on August 18, 2009 after the building owned by the Chapel Hill/Carrboro Schools was given to the Town of Carrboro for the purpose of CSPU6 having a new home for the staff, children and their families.

Community School has faced economic strains through the past 10 years with the unexpected move, renovation cost and economic crises facing the early childhood field. However, we have kept our heads high and worked to serve our diverse population of children and their families to assure that they have access to high quality early care and education. Our current budget is \$562,496.56.

CSPU6 is licensed for 65 children; however, we maintain the National Association for the Education of Young Children staff/child ratios at 1:3 for infants; 1:4 for toddlers; 1:7 for 2/3-year-olds and 1:8 for 4/5-year-olds. Our current enrollment includes: 33 children in these age categories. We serve 51% subsidized by Department of Social Services, Child Care Services and the NC Pre-kindergarten Program and 49% are Fee Paying Families. This has changed in the past 2-3 years, as the number of subsidized families enrolled has reduced as families enrolled moved from subsidized to nonsubsidized funding due to a slight increase in income that makes them ineligible for subsidized child care; but still struggling. A total of 45% of families reside in Carrboro, NC.

Our staff total nine—8 teachers and the director whose education is certified by the NC Institute for Child Development Professionals. A total of 100% of lead teachers have bachelor's degrees in Early Childhood Education or a related field. Most of the staff have been with the child care center for 15-26 years. The director, Anna Mercer-McLean, has been with the center since December 1991---27 years. She has been an advocate for high quality early education for children and for teachers and continues to support these efforts.

Community School currently pays \$100 per month to the Town of Carrboro to cover a portion of the cost for replacement of the old heating and air condition system that stopped working one week after the renovation in 2010. A temporary system was used for one year and then the current system was replaced by the Town in 2011 with much appreciation. CSPU6 pays for insurance, all utilities for the facility, as well as maintains lawn inside the fencing and any repairs to the building or equipment.

Community School for People under Six wishes to thank the Town of Carrboro for its continued support and we would appreciate the extension of the lease agreement to continue to serve the children and families in Orange County and surrounding areas. Thank you!





# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number:**19-141

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

### **TITLE:**

Request-to-Set a Public Hearing on a Land Use Ordinance Amendment Regarding Buildings for Civic Assembly in Village Mixed-Use Developments

**PURPOSE:** The purpose of this agenda item is for the Board of Aldermen to consider setting a public hearing on a text amendment to the Land Use Ordinance regarding buildings for civic assembly in village mixed-use developments.

**DEPARTMENT:** Planning

**CONTACT INFORMATION:** Christina Moon - 919-918-7325, [cmoon@townofcarrboro.org](mailto:cmoon@townofcarrboro.org); Patricia McGuire - 919-918-7327; [pmcguire@townofcarrboro.org](mailto:pmcguire@townofcarrboro.org)

**INFORMATION:** Article XI of the Land Use Ordinance contains the provisions relating to the design and development requirements of village mixed use developments. Section 15-141.2 indicates that one of the objectives of such a development is the “provision of buildings for civic assembly or for other common purposes that act as visual landmarks and symbols of identity within the community.” Eric Chupp of Capkov Ventures has submitted a text amendment request to modify this provision (*Attachment B*).

The Board of Aldermen must receive public comments before adopting amendments to the Land Use Ordinance. Orange County and Planning Board review are also needed. The attached resolution also identifies the Appearance Commission and the Northern Transition Area Advisory Commission as reviewers of the draft ordinance.

**FISCAL & STAFF IMPACT:** Public hearings involve staff and public notice costs associated with advisory board and Board of Aldermen review.

**RECOMMENDATION:** Staff recommends that the Board of Aldermen consider the attached resolution (*Attachment A*) directing staff to prepare a draft ordinance in response to the request, setting a public hearing date of May 28 and referring the proposed amendment to Orange County and the Planning Board.

A RESOLUTION SETTING A PUBLIC HEARING ON A LAND USE ORDINANCE  
AMENDMENT REGARDING BUILDINGS FOR CIVIC ASSEMBLY IN VILLAGE MIXED-  
USE DEVELOPMENTS

WHEREAS, the Board of Aldermen seeks to provide ample opportunities for the public to comment on proposed amendments to the Land Use Ordinance;

NOW, THEREFORE BE IT RESOLVED that the Board of Aldermen directs the staff to prepare a draft ordinance responding to the request from Eric Chupp of Capkov Ventures;

BE IT FURTHER RESOLVED that the Board of Aldermen sets a public hearing on May 28, 2019, to consider adopting “a Land Use Ordinance Amendment Regarding Buildings for Civic Assembly in Village Mixed-Use Developments.”

BE IT FURTHER RESOLVED that the draft ordinance is referred to Orange County and the Town of Carrboro Planning Board for consideration and recommendation prior to the specified public hearing date.

BE IT FURTHER RESOLVED that the draft ordinance is also referred to the following Town of Carrboro advisory boards and commissions.

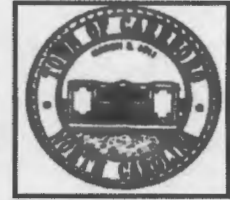
- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Appearance Commission              | <input type="checkbox"/> Recreation and Parks Commission                        |
| <input type="checkbox"/> Transportation Advisory Board                 | <input checked="" type="checkbox"/> Northern Transition Area Advisory Committee |
| <input type="checkbox"/> Environmental Advisory Board                  | <input type="checkbox"/> _____  |
| <input checked="" type="checkbox"/> Economic Sustainability Commission | <input type="checkbox"/> _____  |

This is the 16<sup>th</sup> day of April in the year 2019.

Rec'd  
4/1/15  
PJ

# TOWN OF CARRBORO

## LAND USE ORDINANCE AMENDMENT REQUEST



To the Board of Aldermen, the Planning Board, and the Appearance Commission, as appropriate, of the Town of Carrboro:

I (we), the undersigned do hereby respectfully make application and petition the Board of Aldermen to amend the Land Use Ordinance. In support of this application, the following facts are shown:

1) The Land Use Ordinance, at present, would allow (description/quote, page and number of section in question):

*See Attached*

2) The proposed amendment to the Land Use Ordinance would allow (describe briefly intended change):

*See Attached*

3) State the reasons for the proposed amendment:

*See Attached*

SIGNATURE: *E B Chapp* *Eric B. Chapp for Capkov Ventures*  
*applicant* *(print)* *llc.*

ADDRESS: 258 East Wilmore Ave, Carrboro, NC 27510

TELEPHONE NUMBER: (919) 260-7262

# Capkov Ventures

Developing Homes And Communities Since 1954, In Chapel Hill Since 1972.



a Kovens Company

Tina Moon  
Planning/ Zoning Administrator  
Town of Carrboro  
301 West Main Street, Second Floor  
Carrboro, North Carolina 27510

Dear Ms. Moon,

Please accept this as a formal application from Capkov Ventures Inc. for a "Land Use Ordinance Amendment Request". I have filled out and executed the appropriate application form and attached it hereto.

Answers to Questions 1 – 3.

- 1) The Land Use Ordinance, at present, would allow (description/ quote, page and number of section in question):
  - a. The current Land Use Ordinance, Section 15-141.2(a)(7), page #14, reads that a Village Mixed Use community must achieve the objective by the "Provision of buildings for civic assembly or for other common purposes that act as visual landmarks and symbols of identity within the community."
  - b. The current Land Use Ordinance specifically references and allows Civic Uses to be placed in the Storefront Use Areas and the Townhouse Use areas.
- 2) The proposed amendment to the Land Use Ordinance would allow (describe briefly intended change):
  - a. The proposed amendment would revise Section 15-141.2(a)(7) to read that a Village Mixed Use Community must achieve the objective by the "Provision of buildings **or**

**PO Box 16815 • Chapel Hill, NC 27516 • (919) 942-8005**

**structures** for civic assembly or for other common purposes that act as visual landmarks and symbols of identity within the community”. Adding the words “**or structures**” would recognize the fact that places for civic assembly are often not enclosed in a building in the technical sense as described in the paragraph below responding to question number (3).

- b. Adding Section 15-176.2(e)(5) to the Land Use Ordinance would specifically reference and allow the option of placing Civic Uses in homeowners association owned Common Space. The new sub-section (5) would read “Open Space owned by homeowners associations as Common Space may include Civic Uses for gathering or assembly as defined in Section 15-141.2(a)(7). Civic Uses shall be restricted to Common Space appropriate for gatherings or assembly.”.
- 3) State the reason for the proposed amendment:

Answer: Capkov Ventures Inc. has spent the last 15 years developing the Winmore community off Homestead Road in Carrboro. It was the Town’s first, and to date the only, community to be built under the Village Mixed Use provisions within the Carrboro Land Use Ordinance. As you might imagine, when you develop an entirely new category of community development in a Land Use Ordinance you can expect to have a few glitches. We have discovered many things in developing the Winmore community that we might have planned better had we known then what we know today. Despite a few bumps along the way, not the least of which being the “Great Recession”, I can stand back looking at Winmore and be proud of the community that has been built.

For the Winmore community the amendment will allow a twelve-unit condominium building to be constructed on the Civic Use lot that which has remained vacant for the last 13 years. The last lot in Winmore. We have followed every avenue we could think of to find a user for the lot to no avail. The lot is in a wonderful location within the community, across from the live work units, adjacent to existing town homes, and high on East Winmore Avenue. The problem is that there was never any parking allocated to the lot that would support any of the Civic Uses allowed. The vacant lot adds nothing to the community, leaves an unfinished look, and contributes only a fraction of what it should as a developed lot. The 12-unit condominium building would be consistent with the surrounding uses, be a significant visual improvement to the community, allow the community to maximize the allowable density by providing more homes, and add to Carrboro’s and Orange Counties tax base. The architecture of the proposed building will require Town approval.

In addition to the benefit the amendment would provide to the Winmore community the amendment to the Village Mixed Use provisions in the Carrboro Land Use Ordinance would benefit the wider community and future Village Mixed Use communities by allowing more flexibility for the Board of Aldermen to approve civic oriented uses on community common area, and the types of civic uses which could be provided. One of the things that we learned in developing communities over the last 30 years is that home owners associations have limited resources, and they are generally insufficient to bear the burden of maintaining a

building as the Carrboro Land Use Ordinance currently requires of a Civic Use (Section 15-141.2(a)(7)). This is certainly the case with Winmore. However, civic gathering spots could be integrated into the community on common space where no land value is assigned making Civic Uses financially feasible for communities. Examples of civic gathering places that are not necessarily "Buildings" in the technical sense are numerous. I think of the pit area on UNC campus behind the library where U.S Representative Price has spoken, amphitheatres that are generally associated with the US or North Carolina Parks System, the Forest Theater, and the roof of the downtown parking garage in Chapel Hill where summer movies are show. All wonderful Civic meeting places that don't require heating, air conditioning, electricity, cleaning, routine and long-term maintenance, not to mention the initial construction cost. We believe that amending the Carrboro Land Use Ordinance to allow Civic Uses on community common space, and to broaden the definition of Civic Uses to include structures other than "Buildings" will give the Board of Aldermen the flexibility to approve these types of alternative Civic Uses. We ask for your support in approving this Carrboro Land Use Ordinance Text Amendment.

Best Regards, Eric Chupp



4/1/2019

Director of Development  
Capkov Ventures Inc.  
(919) 260-7262  
[ericbchupp@bellsouth.net](mailto:ericbchupp@bellsouth.net)





# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number:**19-140

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

### **TITLE:**

Request to Make Appointments to the Economic Sustainability Commission

**PURPOSE:** The purpose of this agenda item is for the Board of Aldermen to make appointments to the Economic Sustainability Commission

**DEPARTMENT:** Town Clerk

**CONTACT INFORMATION:** Cathy Dorando, 919-918-7309

**INFORMATION:** The Carrboro Economic Sustainability Commission five seats available for appointment; three expiring terms and two vacant seats.

In total, seven applications were received from David Jessee, John Moracco, Jim Porto, Bill Thompson, Rasam Toolee, Terri Turner, and Mark Vandegrift.

Each chair shall contact each applicant and invite them to at least one meeting of their board so they may understand the responsibilities of the board and the necessary time commitment. (Chairs should contact Town staff in the event of a language barrier.) The chairs shall also talk with the applicants about their interest in serving on the advisory board. Board chairs may meet personally with applicants if a meeting of their board is not anticipated within 30 days following receipt of the applicant's request for appointment. This would be in lieu of having the applicant attend a meeting of that board or commission. If applicants do not attend a meeting after two phone calls or emails, then the Chair shall notify the Town Clerk of that fact and said application will be removed from further consideration.

The chair of each board shall submit a Recommendation Form/Application Review Form to the Town Clerk within one week of the applicant's attendance at a meeting. If a meeting is not planned, the chair shall provide a Recommendation Form/Application Review to the Town Clerk within one week of a conversation with the applicant.

Copies of all applications and recommendation forms received shall be forwarded to the Mayor and Board of Aldermen.

Robert 'Bob' Saunders is the current chair of the Economic Sustainability Commission and provided the attached chair forms.

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

Ballots will be provided for the Board of Aldermen during the meeting.

**FISCAL & STAFF IMPACT:** N/A

**RECOMMENDATION:** It is recommended that the Board adopt the resolution.



A RESOLUTION MAKING APPOINTMENTS TO THE ECONOMIC SUSTAINABILITY  
COMMISSION

Section 1: The Board of Aldermen hereby makes the following appointments:

<b>Seat Designation</b>	<b>Appointee</b>	<b>Term Expiration</b>
RESIDENT		2/2022
BUSINESS OWNER		2/2022
BUSINESS OWNER		2/2022
BUSINESS OWNER		2/2022
DOWNTOWN RESIDENT		2/2021

The current makeup of the Economic Sustainability Commission is:

NAME	ELECTED/ APPOINTE D	TERM EXPIRATION	DOB	RACE	SEX	OCCUPATION
David Darr	4/3/2018	2/1/2021	1/20/1978	white	male	Scientist/administrator
David Gange	3/7/2017	2/1/2020 Resident	8/23/1975	White	Male	Architect
Tanya Jisa	4/3/2018	2/1/2021 At-Large	10/20/1967	Caucasian	F	Social Worker
Bob Saunders, Chair	2/9/2010 2/16/2016	2/1/2019 Resident	3/3/1959	white	male	lawyer
Bill Thompson	2/16/2016	2/1/2019 Business Owner	1/7/1967	w	male	Real Estate Consultant
VACANT		2/1/2019 Business Owner				
Jim Porto	4/10/2018	2/1/2019 Downtown Resident	2/8/2019	White	M	Retired
VACANT		2/2021 Business Owner				
Robert Hash	2/16/16 (partial term)	2/1/2020 At Large	11/10/1984	White	Male	Student
Dan Mayer		Arts Committee Liaison				

Applicant summary information (full detail available in application):

FIRST	LAST	ADDRESS	DOB	RACE	SEX	OCCUPATION
David	Jessee	1543 Pathway Drive	1/20/1966	Caucasian	Male	Landlord
Jack	Moracco	213 Cobblestone Drive	5/20/1969	White	Male	Homemaker
Rasam	Tooloe	102 Painted Turtle Ln.	5/4/1972	Mixed	M	Director of Sales
Terri	Turner	1208 Spruce Street	5/29/1971	White	Female	Real Estate Broker
Mark	Vandergrift	202 Wyndham Drive	12/9/1976	Caucasian	Male	VP Product Management

## Catherine Dorando

---

**From:** noreply@civicplus.com  
**Sent:** Friday, March 29, 2019 11:59 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Chair Recommendation Form

### Advisory Board Chair Recommendation Form

Advisory Board Name	ESC
Your Name	Bob Saunders
Applicant Name	David Jessee
Outstanding Qualifications	Carrboro business owner and former ESC member
How applicant compliments current board composition:	business perspective and continuity
Other comments:	<i>Field not completed.</i>
Applicant Name	Terri Turner
Outstanding Qualifications	Carrboro realtor and former ESC member
Other Comments:	<i>Field not completed.</i>
Applicant Name	Jim Porto
Outstanding Qualifications:	current ESC member and former elected official
Other Comments:	active ESC member
Applicant Name	Mark Vandegrift
Outstanding Qualifications:	IT business background and current Parks and Recreation member
Other Comments:	<i>Field not completed.</i>
Applicant Name	Jack Moracco
Outstanding Qualifications:	former history teacher and stay at home dad

**Catherine Dorando**

---

**From:** noreply@civicplus.com  
**Sent:** Friday, March 29, 2019 11:53 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Chair Applicant Summary and Contact Form

### Advisory Board Chair Applicant Summary and Contact Form

Advisory Board Name:	ESC
Your Name	Bob Saunders
Your Seat Title	chair
Applicant Name:	Jack Moracoo
Date of last contact with applicant	2/13/2019
Summary of Qualifications:	former history teacher and stay at home father
Advisory Board Chair reconfirmed applicant's interest in serving by phone or email:	Yes
If no, briefly explain	<i>Field not completed.</i>
Applicant attended advisory board meeting prior to BOA review:	Yes
If yes, date of advisory board meeting:	2/13/2019
Applicant has demonstrated a clear understanding of the time commitment, roles, and responsibilities of serving on the advisory board:	Yes
If no, briefly explain:	<i>Field not completed.</i>
In addition to your comments above, please	Occupation, experience or special skills, Other



## Catherine Dorando

---

**From:** noreply@civicplus.com  
**Sent:** Friday, March 29, 2019 11:50 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Chair Applicant Summary and Contact Form

### Advisory Board Chair Applicant Summary and Contact Form

Advisory Board Name:	ESC
Your Name	Bob Saunders
Your Seat Title	Chair
Applicant Name:	Mark Vandergrift
Date of last contact with applicant	2/13/2019
Summary of Qualifications:	IT work experience and current member of Parks and Rec
Advisory Board Chair reconfirmed applicant's interest in serving by phone or email:	Yes
If no, briefly explain	<i>Field not completed.</i>
Applicant attended advisory board meeting prior to BOA review:	Yes
If yes, date of advisory board meeting:	2/13/2019
Applicant has demonstrated a clear understanding of the time commitment, roles, and responsibilities of serving on the advisory board:	Yes
If no, briefly explain:	<i>Field not completed.</i>
In addition to your comments above, please	Occupation, experience or special skills, Previous public service or community involvement

## Catherine Dorando

---

**From:** noreply@civicplus.com  
**Sent:** Friday, March 29, 2019 11:42 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Chair Applicant Summary and Contact Form

### Advisory Board Chair Applicant Summary and Contact Form

Advisory Board Name:	ESC
Your Name	Bob Saunders
Your Seat Title	Chair
Applicant Name:	Jim Porto
Date of last contact with applicant	3/26/2019
Summary of Qualifications:	current board member -- active in ESC meetings -- former elected official
Advisory Board Chair reconfirmed applicant's interest in serving by phone or email:	Yes
If no, briefly explain	<i>Field not completed.</i>
Applicant attended advisory board meeting prior to BOA review:	Yes
If yes, date of advisory board meeting:	2/13/2019
Applicant has demonstrated a clear understanding of the time commitment, roles, and responsibilities of serving on the advisory board:	Yes
If no, briefly explain:	<i>Field not completed.</i>
In addition to your comments above, please	Occupation, experience or special skills, Previous public service or community involvement

## Catherine Dorando

---

**From:** noreply@civicplus.com  
**Sent:** Friday, March 29, 2019 11:38 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Chair Applicant Summary and Contact Form

### Advisory Board Chair Applicant Summary and Contact Form

Advisory Board Name:	ESC
Your Name	Bob Saunders
Your Seat Title	Chair
Applicant Name:	Terri Turner
Date of last contact with applicant	3/28/2019
Summary of Qualifications:	Carrboro realtor and former ESC member
Advisory Board Chair reconfirmed applicant's interest in serving by phone or email:	Yes
If no, briefly explain	<i>Field not completed.</i>
Applicant attended advisory board meeting prior to BOA review:	No
If yes, date of advisory board meeting:	<i>Field not completed.</i>
Applicant has demonstrated a clear understanding of the time commitment, roles, and responsibilities of serving on the advisory board:	Yes
If no, briefly explain:	<i>Field not completed.</i>
In addition to your comments above, please	Gender diversity, Occupation, experience or special skills, Previous public service or community involvement



**Catherine Dorando**

---

**From:** noreply@civicplus.com  
**Sent:** Friday, March 29, 2019 11:35 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Chair Applicant Summary and Contact Form

**Advisory Board Chair Applicant Summary and Contact Form**

Advisory Board Name:	ESC
Your Name	Bob Saunders
Your Seat Title	Chair
Applicant Name:	David Jessee
Date of last contact with applicant	1/22/2019
Summary of Qualifications:	Carrboro Business owner and former ESC member
Advisory Board Chair reconfirmed applicant's interest in serving by phone or email:	Yes
If no, briefly explain	<i>Field not completed.</i>
Applicant attended advisory board meeting prior to BOA review:	No
If yes, date of advisory board meeting:	<i>Field not completed.</i>
Applicant has demonstrated a clear understanding of the time commitment, roles, and responsibilities of serving on the advisory board:	Yes
If no, briefly explain:	<i>Field not completed.</i>
In addition to your comments above, please	Occupation, experience or special skills, Previous public service or community involvement

Sent 1/22

**Catherine Dorando**

---

**From:** noreply@civicplus.com  
**Sent:** Tuesday, January 22, 2019 11:41 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Application

Advisory Board Application

First Name	David
Last Name	Jessee
Date	1/22/2019
Address1	1543 Pathway Drive
Address2	<i>Field not completed.</i>
City	Carrboro
State	NC
Zip	27510
Is this address located within the corporate limits of the Town of Carrboro?	Yes
Is this address located within the Town's ETJ, Planning Jurisdiction, or Northern Transition Area?	Planning Jurisdiction
Telephone	9195486408
Email Address	<a href="mailto:davidjessee@mindspring.com">davidjessee@mindspring.com</a>
Date of Birth	1/20/1966
Race	Caucasian
Sex	male
Occupation	Landlord
Are you a registered	Yes

Orange County Voter?

Length of Residence in Orange County	7 years
Length of Residence in the Town of Carrboro	7 years
I wish to be considered for appointment to the following committee/board(s) (Select no more than two (2)):	Economic Sustainability Commission
Other (advisory board not listed):	Economic Sustainability Commission
Advisory Board Preference	Economic Sustainability Commission
*Employer/Self Employed	Self employed
Number of Years Employed	15
* Provide examples of how you are involved in the promotion of travel and tourism in the Town of Carrboro.	<i>Field not completed.</i>
Community Activities/Organizational Memberships	Formerly served on ESC. In town business owner. CBA member, Chapel Hill/Carrboro Chamber of Commerce member
Experience to Aid You in Working on Advisory Boards	Previous experience on ESC, developer of property in Carrboro and Chapel Hill
Reasons You Wish to be Appointed	Ready to serve again on this board.
Have you ever served on any Town of Carrboro Committee or Board?	Yes
If yes, which one(s)?	ESC
Are you currently serving	No

on a Town Board or  
Committee?

---

If yes, are you applying for a third consecutive term? No

---

If yes, please describe how you meet one, or more, of the following exceptions noted below. no

---

Email not displaying correctly? [View it in your browser.](#)



Sent 1/24

**Catherine Dorando**

---

**From:** noreply@civicplus.com  
**Sent:** Wednesday, January 23, 2019 10:28 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Application

Advisory Board Application

First Name	John ("Jack")
Last Name	Moracco
Date	1/23/2019
Address1	213 COBBLESTONE DR.
Address2	<i>Field not completed.</i>
City	CHAPEL HILL
State	NC
Zip	27516
Is this address located within the corporate limits of the Town of Carrboro?	Yes
Is this address located within the Town's ETJ, Planning Jurisdiction, or Northern Transition Area?	No
Telephone	9194521056
Email Address	<a href="mailto:moraccoj@gmail.com">moraccoj@gmail.com</a>
Date of Birth	5/20/1969
Race	white
Sex	male
Occupation	homemaker
Are you a registered	Yes

Orange County Voter?

Length of Residence in Orange County	13 years
Length of Residence in the Town of Carrboro	13 years
I wish to be considered for appointment to the following committee/board(s) (Select no more than two (2)):	Economic Sustainability Commission
Other (advisory board not listed):	<i>Field not completed.</i>
Advisory Board Preference	Economic Sustainability Commission
*Employer/Self Employed	self
Number of Years Employed	17
* Provide examples of how you are involved in the promotion of travel and tourism in the Town of Carrboro.	<i>Field not completed.</i>
Community Activities/Organizational Memberships	I have had two kids come through Chapel Hill schools for the last 13 years. I have spent the bulk of my time raising them and participating in their activities, such as Triangle Soccer, YMCA programs, NCFC soccer, and Carrboro Rec baseball.
Experience to Aid You in Working on Advisory Boards	I have experience teaching history and political science in the Durham County Public Schools prior to becoming a stay-at-home dad. I have a great deal of academic knowledge about history and politics.
Reasons You Wish to be Appointed	I wish to apply my knowledge of the town and my history teaching experience to aid decision-making about the economic future of Carrboro. I believe in sustainable growth and could be an asset to this committee.
Have you ever served on any Town of Carrboro	No

Committee or Board?

---

If yes, which one(s)? *Field not completed.*

---

Are you currently serving on a Town Board or Committee? No

---

If yes, are you applying for a third consecutive term? No

---

If yes, please describe how you meet one, or more, of the following exceptions noted below. N/A

---

Email not displaying correctly? [View it in your browser.](#)

Sent 2/11

## Catherine Dorando

---

**From:** noreply@civicplus.com  
**Sent:** Friday, February 08, 2019 12:44 PM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Application

### Advisory Board Application

First Name	Jim
Last Name	Porto
Date	2/8/2019
Address1	107 Watters Rd
Address2	<i>Field not completed.</i>
City	Carrboro
State	North Carolina
Zip	27510
Is this address located within the corporate limits of the Town of Carrboro?	Yes
Is this address located within the Town's ETJ, Planning Jurisdiction, or Northern Transition Area?	Planning Jurisdiction
Telephone	9199676949
Email Address	<a href="mailto:jim_porto@communityCAPS.org">jim_porto@communityCAPS.org</a>
Date of Birth	2/8/2019
Race	White
Sex	M
Occupation	Retired
Are you a registered	Yes



Orange County Voter?

Length of Residence in Orange County 43 yrs

Length of Residence in the Town of Carrboro 43 yrs

I wish to be considered for appointment to the following committee/board(s) (Select no more than two (2)):  
Economic Sustainability Commission

Other (advisory board not listed): *Field not completed.*

Advisory Board Preference Economic Sustainability Commission

\*Employer/Self Employed Retired

Number of Years Employed 3 years

\* Provide examples of how you are involved in the promotion of travel and tourism in the Town of Carrboro. *Field not completed.*

Community Activities/Organizational Memberships Current ESC Board member SECU Advisory Committee Sierra Club

Experience to Aid You in Working on Advisory Boards Taught financial management, School of Public Health Ran distance education program in health care administration.

Reasons You Wish to be Appointed To serve the community.

Have you ever served on any Town of Carrboro Committee or Board? Yes

If yes, which one(s)? Appearance Commission, ESC.

Are you currently serving Yes

on a Town Board or  
Committee?

---

If yes, are you applying  
for a third consecutive  
term?

No

---

If yes, please describe  
how you meet one, or  
more, of the following  
exceptions noted below.

Not sure why this box popped up...it might be an bug. I have  
not served two full terms, only one unexpired one. I checked a  
YES in the first question and a NO in the second.

---

Email not displaying correctly? [View it in your browser.](#)

**Catherine Dorando**

---

**From:** noreply@civicplus.com  
**Sent:** Thursday, December 06, 2018 12:07 PM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Application

**Advisory Board Application**

First Name	Bill
Last Name	Thompson
Date	12/6/2018
Address1	212 Laurel Ave.
Address2	<i>Field not completed.</i>
City	Carrboro
State	NC
Zip	27510
Is this address located within the corporate limits of the Town of Carrboro?	Yes
Is this address located within the Town's ETJ, Planning Jurisdiction, or Northern Transition Area?	Planning Jurisdiction
Telephone	9198865250
Email Address	<a href="mailto:bill@billtrealty.com">bill@billtrealty.com</a>
Date of Birth	1/7/1967
Race	w
Sex	male
Occupation	Real Estate Consultant
Are you a registered	Yes



Orange County Voter?

Length of Residence in Orange County 10 years

Length of Residence in the Town of Carrboro 10 years

I wish to be considered for appointment to the following committee/board(s) (Select no more than two (2)):  
Economic Sustainability Commission, Planning Board

Other (advisory board not listed): *Field not completed.*

Advisory Board Preference ESC

\*Employer/Self Employed Self

Number of Years Employed 5

\* Provide examples of how you are involved in the promotion of travel and tourism in the Town of Carrboro.  
I recommend Carrboro to my clients who are relocating to the area.

Community Activities/Organizational Memberships  
I have been on the parks and recreation, and the ESC boards in the past. I belong to the realtor's association. I have volunteered in the past with habitat for humanity type organizations and as a Guardian Ad Litem.

Experience to Aid You in Working on Advisory Boards  
I have been on the parks and recreation, and the ESC boards in the past. I have experience in real estate, structural engineering, law enforcement, construction, small business owner with employees,

Reasons You Wish to be Appointed  
I want to contribute to my community and want the town to continue to shine!

Have you ever served on any Town of Carrboro Committee or Board?  
Yes

If yes, which one(s)? ESC, Parks and Rec.

---

Are you currently serving on a Town Board or Committee? Yes

---

If yes, are you applying for a third consecutive term? No

---

If yes, please describe how you meet one, or more, of the following exceptions noted below. NA

---

Email not displaying correctly? [View it in your browser.](#)

## Catherine Dorando

---

**From:** noreply@civicplus.com  
**Sent:** Thursday, November 15, 2018 12:19 PM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Application

### Advisory Board Application

First Name	Rasam
Last Name	Toolee
Date	11/15/2018
Address1	102 Painted Turtle Ln
Address2	<i>Field not completed.</i>
City	Chapel Hill
State	NC
Zip	27516
Is this address located within the corporate limits of the Town of Carrboro?	Yes
Is this address located within the Town's ETJ, Planning Jurisdiction, or Northern Transition Area?	ETJ
Telephone	9253526100
Email Address	<a href="mailto:2rasam@gmail.com">2rasam@gmail.com</a>
Date of Birth	5/4/1972
Race	Mixed
Sex	M
Occupation	Director of Sales
Are you a registered	Yes

Orange County Voter?

Length of Residence in Orange County 4 months

Length of Residence in the Town of Carrboro 4 months

I wish to be considered for appointment to the following committee/board(s) (Do Not Select More Than Two): Economic Sustainability Commission, Planning Board

Other (advisory board not listed): *Field not completed.*

Advisory Board Preference Planning board

\*Employer/Self Employed Microsoft

Number of Years Employed 4

\* Provide examples of how you are involved in the promotion of travel and tourism in the Town of Carrboro. *Field not completed.*

Community Activities/Organizational Memberships NA

Experience to Aid You in Working on Advisory Boards Plannih and economic advisory functions in my professional career

Reasons You Wish to be Appointed I think it's important to be involved and contribute to the local community

Have you ever served on any Town of Carrboro Committee or Board? No

If yes, which one(s)? *Field not completed.*

Are you currently serving No



on a Town Board or  
Committee?

---

If yes, are you applying  
for a third consecutive  
term? No

---

If yes, please describe  
how you meet one, or  
more, of the following  
exceptions noted below.  
\*Members of the Board  
of Adjustment,  
Environmental Advisory  
Board, Human Services  
Advisory Commission,  
and Transportation  
Advisory Board may be  
reappointed to successive  
terms without limitation  
(Sections 15-29(c), 15-  
45(c) 3-7(d), 3-24(c))

---

Email not displaying correctly? [View it in your browser.](#)



**Catherine Dorando**

---

**From:** noreply@civicplus.com  
**Sent:** Wednesday, February 06, 2019 9:04 PM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Application

Advisory Board Application

First Name	Terri
Last Name	Turner
Date	2/6/2019
Address1	1208 Spruce Street
Address2	<i>Field not completed.</i>
City	Durhan
State	NC
Zip	27701
Is this address located within the corporate limits of the Town of Carrboro?	No
Is this address located within the Town's ETJ, Planning Jurisdiction, or Northern Transition Area?	No
Telephone	9199232345
Email Address	<a href="mailto:terri@weaverstreetrealty.com">terri@weaverstreetrealty.com</a>
Date of Birth	5/29/1971
Race	white
Sex	female
Occupation	Real Estate Broker
Are you a registered	No

Orange County Voter?	
Length of Residence in Orange County	n/a
Length of Residence in the Town of Carrboro	n/a
I wish to be considered for appointment to the following committee/board(s) (Select no more than two (2)):	Economic Sustainability Commission
Other (advisory board not listed):	<i>Field not completed.</i>
Advisory Board Preference	ESC
*Employer/Self Employed	Weaver Street Realty
Number of Years Employed	18
* Provide examples of how you are involved in the promotion of travel and tourism in the Town of Carrboro.	<i>Field not completed.</i>
Community Activities/Organizational Memberships	member of the The Chamber's Government Affairs Committee owner at Weaver Street Realty
Experience to Aid You in Working on Advisory Boards	CFO of Weaver Street Realty High level of interest in promoting business growth in Carrboro Former member of the ESC and former Chair of the ESC
Reasons You Wish to be Appointed	While no longer a Carrboro resident, I am one of the owners of a long standing Carrboro business, Weaver Street Realty. I am committed to Carrboro remaining a vibrant town with a variety of businesses including retail, light industrial, office, or part of the artistic and gig-economy.
Have you ever served on any Town of Carrboro Committee or Board?	Yes

If yes, which one(s)?	Economic Sustainability Commission
Are you currently serving on a Town Board or Committee?	No
If yes, are you applying for a third consecutive term?	No
If yes, please describe how you meet one, or more, of the following exceptions noted below.	n/a

Email not displaying correctly? [View it in your browser.](#)

## Catherine Dorando

---

**From:** noreply@civicplus.com  
**Sent:** Tuesday, January 08, 2019 8:33 AM  
**To:** Catherine Dorando  
**Subject:** Online Form Submittal: Advisory Board Application

### Advisory Board Application

First Name	Mark
Last Name	Vandegrift
Date	1/8/2019
Address1	202 Wyndham drive
Address2	<i>Field not completed.</i>
City	Chapel hill
State	NC
Zip	27516-4625
Is this address located within the corporate limits of the Town of Carrboro?	Yes
Is this address located within the Town's ETJ, Planning Jurisdiction, or Northern Transition Area?	No
Telephone	9196076178
Email Address	<a href="mailto:markvandegrift@gmail.com">markvandegrift@gmail.com</a>
Date of Birth	12/9/1976
Race	Caucasian
Sex	Male
Occupation	VP Product Management
Are you a registered	Yes



Orange County Voter?

Length of Residence in Orange County 4.5 years

Length of Residence in the Town of Carrboro 4.5 years

I wish to be considered for appointment to the following committee/board(s) (Select no more than two (2)):  
Board of Adjustment, Economic Sustainability Commission

Other (advisory board not listed): *Field not completed.*

Advisory Board Preference Economic Sustainability Commission

\*Employer/Self Employed ChannelAdvisor Corporation

Number of Years Employed 17

\* Provide examples of how you are involved in the promotion of travel and tourism in the Town of Carrboro. N/A

Community Activities/Organizational Memberships Current: Recreation and Parks Commission Past: Volunteer coach for Recreation and Parks basketball league

Experience to Aid You in Working on Advisory Boards Serving on the Recreation and Parks Commission as well as 20 years business experience.

Reasons You Wish to be Appointed Give back to the town of Carrboro.

Have you ever served on any Town of Carrboro Committee or Board? Yes

If yes, which one(s)? Recreation and Parks Commission

Are you currently serving Yes

on a Town Board or  
Committee?

---

If yes, are you applying  
for a third consecutive  
term? No

---

If yes, please describe  
how you meet one, or  
more, of the following  
exceptions noted below. N/A

---

Email not displaying correctly? [View it in your browser.](#)



# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number:**19-137

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

### **TITLE:**

Consideration of a Funding Request from the Orange County Veterans Memorial Committee

**PURPOSE:** The purpose of this agenda item is to consider a funding request of \$25,000 to support the construction of the Orange County Veterans Memorial.

**DEPARTMENT:** Town Manager's Office

**CONTACT INFORMATION:** David Andrews, Town Manager, 919-918-7315,  
dandrews@townofcarrboro.org

**INFORMATION:** On January 8, 2019, Orange County Veterans Memorial Committee Co-Chairs, Jim Merritt and Bruce Runberg, presented their request for funding the memorial to the Town of Carrboro Board of Aldermen.

[http://carrboro.granicus.com/MediaPlayer.php?view\\_id=2&clip\\_id=222](http://carrboro.granicus.com/MediaPlayer.php?view_id=2&clip_id=222)

The Board requested that staff look into the funding proportionality equation and that the Orange County Veterans Memorial Committee consider monument language that is educational and forward thinking. Alderperson Barbara Foushee became an active member of their Committee after this meeting.

In an email dated April 1, 2019, Mr. Merritt and Mr. Runberg contacted the Board of Aldermen to formally request \$25,000 in support of the project and provided additional information (Attachment B). In correspondence with staff, they noted that their funding request is based on a combination of jurisdiction population size and past support, to date. They have requested \$50,000 from Chapel Hill (they also provided about \$15,000 for the original design), and \$25,000 from Orange County (they provided the 3 acre site, \$15,000, and part time staff support of 3 county employees over a 2 year period). They will also request funding from Hillsborough.

**FISCAL & STAFF IMPACT:** The Town has not included provisions in the current budget to provide \$25,000 for the memorial. However, on March 12, 2019, the Board of Alderman approved the use of the closed Special Revenue Fund, Business Loan Fund (BLF), to support non-profit capital requests.

[http://carrboro.granicus.com/MediaPlayer.php?view\\_id=2&clip\\_id=231](http://carrboro.granicus.com/MediaPlayer.php?view_id=2&clip_id=231)

---

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

Currently, \$32,000 remains in this fund. Once this balance is expended, the fund will not be replenished. There is no staff impact.

**RECOMMENDATION:** Staff recommends the Board of Aldermen consider utilizing the closed Business Loan Fund to fund the \$25,000 request to support the construction of the Orange County Veterans Memorial. If the Board chooses to do so, a resolution is attached.



**A RESOLUTION CONCERNING A REQUEST FOR FUNDS TO SUPPORT THE  
SECOND PHASE OF THE ORANGE COUNTY VETERANS MEMORIAL**

WHEREAS, the Town of Carrboro Board of Aldermen received a presentation from the Orange County Veterans Memorial Committee on January 8, 2019; and

WHEREAS, the Orange County Veterans Memorial is located within Orange County's Southern Government Services Campus on 2501 Homestead Road in Chapel Hill; and

WHEREAS, the Orange County Veterans Memorial honors the memory of all service men and women from all military branches, including residents of Carrboro who have served in those branches; and

WHEREAS, the Orange County Veterans Memorial is designed to provide a place for people to reflect and thank those who have served and are serving; and

WHEREAS, the Orange County Veterans Memorial Committee requests the Town of Carrboro Board of Aldermen fund the next phase of construction of the Orange County Veterans Memorial at the level of \$25,000; and

WHEREAS, on March 12, 2019 the Board of Aldermen approved the use of the closed Special Revenue Fund, the Business Loan Fund, to fund nonprofit capital projects;

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF ALDERMEN OF THE TOWN OF CARRBORO:**

Section 1: The Board of Aldermen approves the funding request of \$25,000 for the second phase of the Orange County Veterans Memorial.

Section 2: The Board of Aldermen approves the use of funds from the closed Business Loan Fund to fund this request.

Section 3: This resolution shall become effective upon adoption.

-----Original Message-----

From: Bruce Runberg [<mailto:brunberg17@gmail.com>]

Sent: Monday, April 01, 2019 4:04 PM

To: boa

Cc: Catherine Dorando; David Andrews; <[jimmerritt@nc.rr.com](mailto:jimmerritt@nc.rr.com)>; Lee Heavlin; David Chandler

Subject: Orange County Veterans Memorial Funding Request

Dear Board Members,

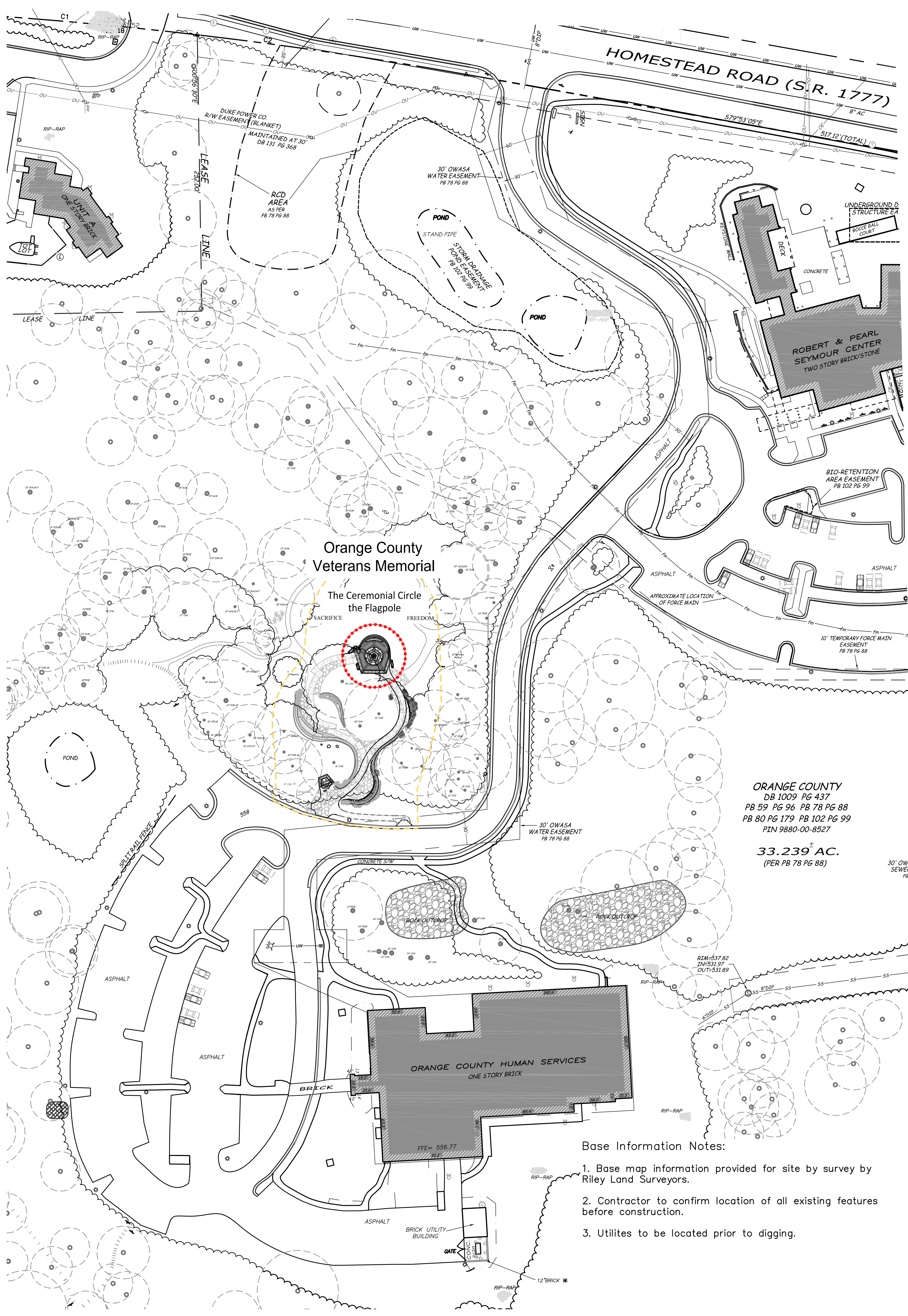
Jim Merritt and I are Co-Chairs of the Veterans Memorial, We came before you on 8 January 2019 and requested your support in providing \$25k to this important project. We left several of our brochures with you and the Manager. And your Barbara Foushee is now an active member of our Committee. We believe the project was well received!

We understand you are in the midst of budget discussions. By this email, we formally request the donation of \$25k to our extremely worthwhile project. The Memorial is currently open with paths, a temporary flagpole, and a temporary kiosk, constructed under our first phase. It is located in a beautiful 3 acre site full of oaks near the Seymour Senior Center off Homestead Road. It will be a place of beauty, reflection, historical information, education; open to everyone. I have attached a copy of our design by David Swanson for the 2nd phase. There will be 2 or 3 more phases to complete the work. We are also requesting funds from other local Towns and the County, based on proportional size. We are making good headway there. I would add that there are over 6,000 veterans in Orange County we can serve.

Many thanks for your consideration of this request.

Jim Merritt and Bruce Runberg, Co-Chairs of the Orange County Veterans Memorial



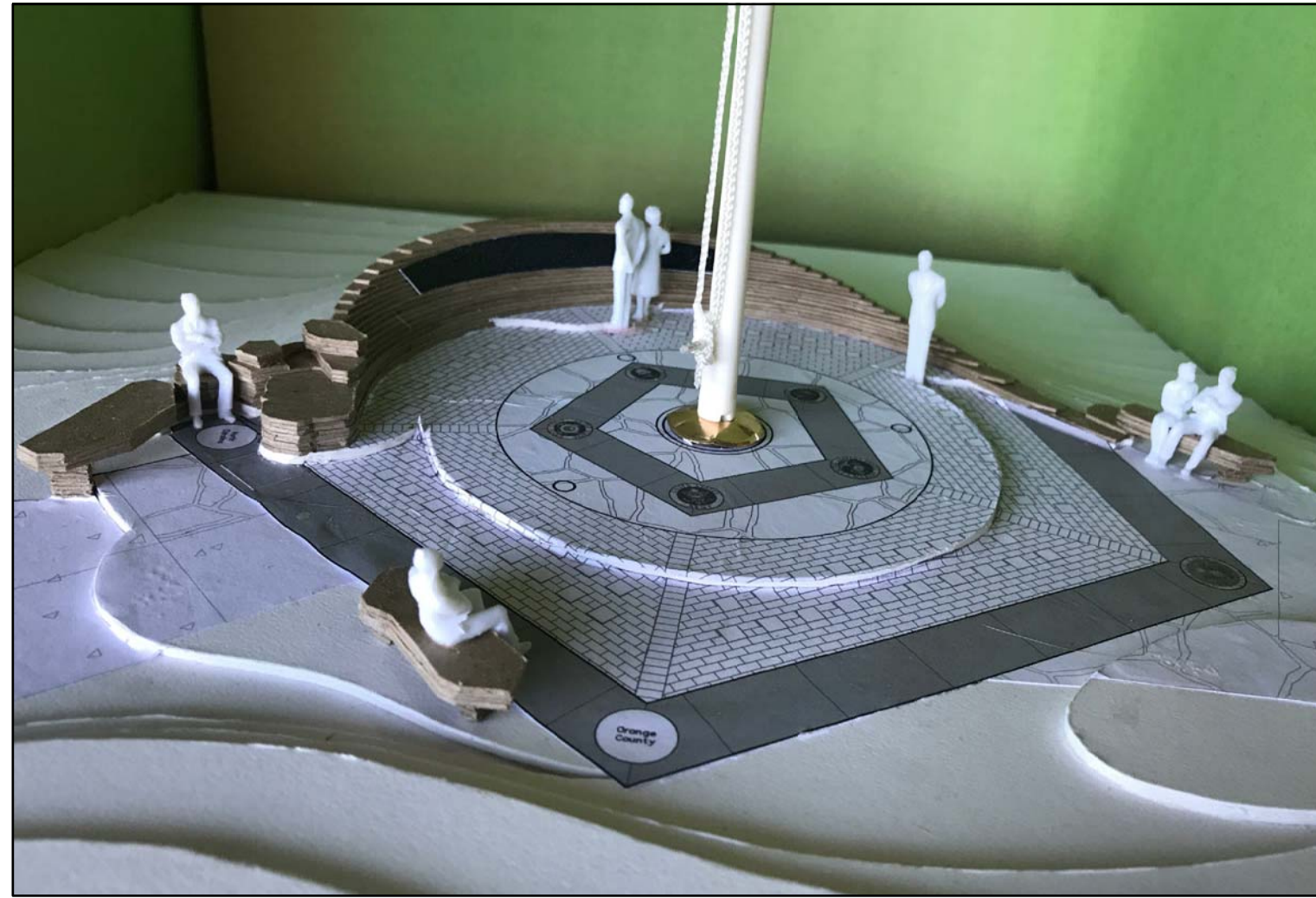


Base Information Notes:

1. Base map information provided for site by survey by Riley Land Surveyors.
2. Contractor to confirm location of all existing features before construction.
3. Utilities to be located prior to digging.



Veterans Memorial showing views with future buildout



Veterans Memorial Model (by Dan Hassell)

LIST OF DRAWINGS

L - 1.0	Cover Site Context Project Summary
L - 1.1	Existing Conditions (1"=10' scale)
L - 2.0	Site Plan (1"=10' scale)
L - 2.1	Grading Plan Erosion Control (1"=10' scale)
L - 3.0	Detail Ceremonial Circle Plan Details
L - 3.1	Details

GENERAL NOTES:

- Pre-Construction:
1. Location of staging area will be identified during the pre-bid conference. The existing parking area off Southern Human Service Center Drive will be used for access and construction parking for the site during the time period outlined in Note 4. Other times will be the responsibility of the contractor to determine access to site and construction parking and staging of materials.
  2. PROPOSED SCHEDULE: Contractor shall bring in all necessary construction materials between XX and XX.
  3. Contractor shall verify all existing conditions and dimensions in the field.
  4. Contractor to coordinate with Orange County Southern Human Services and Utility Locating Service to verify locations of underground utilities and easements.

GENERALIZED SCOPE OF PROJECT

BASE BID: By Contractor

Pre-Construction:

- Install construction management signs (By Contractor)
- Install Tree Protection Fencing (By Contractor)
- Provide Silt Fencing during Construction. (By Contractor)

New Construction:

- Construct Memorial Stone Wall and associated boulder rocks. (By Contractor)
- Grading and drainage work to swale around the ceremonial circle. Extend existing drain pipe and make drainage improvements and catch basin as indicated.
- Install stone paving and concrete pavers (including donor pavers).
- Install bluestone border and medallions as shown.
- Install Flagpole and associated hardscape.
- Install Landscape Lighting to uplight flagpole.
- Clean job site of construction materials upon completion of Hardscape Improvements. (By Contractor)

BY OTHERS - Orange County (OWNER):

- Remove selected trees (dead or dying or in way of construction). Thin and prune and tree management for existing trees to remain.
- Provide electrical stub to site from existing meters and electric transformer at Southern Human Services site.
- Provide site furnishings (site benches as shown, signage and trash containers).

SWANSON  
and ASSOCIATES P.A.  
LANDSCAPE ARCHITECTURE  
100 E. Carr Street  
Carrboro, NC 27510  
Ph: (919) 929-9000  
info@swansonlandscapearchitecture.com

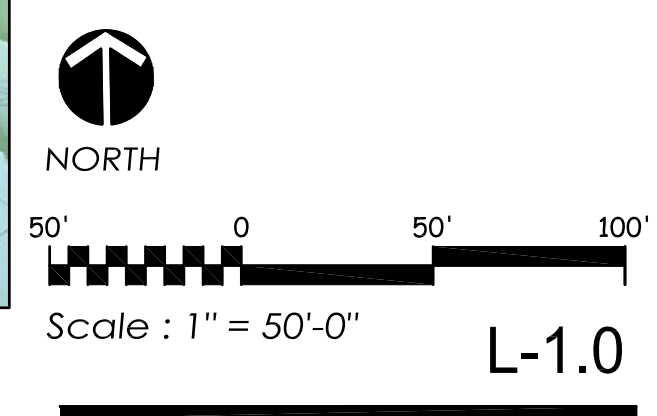
Danny W. Hassell, LTC  
(ref), U.S. Army  
ArcLand Designs, L.L.C.

# Orange County Veterans Memorial

Orange County Southern Human Services Center

Homestead Road  
Chapel Hill, NC

April 20, 2018

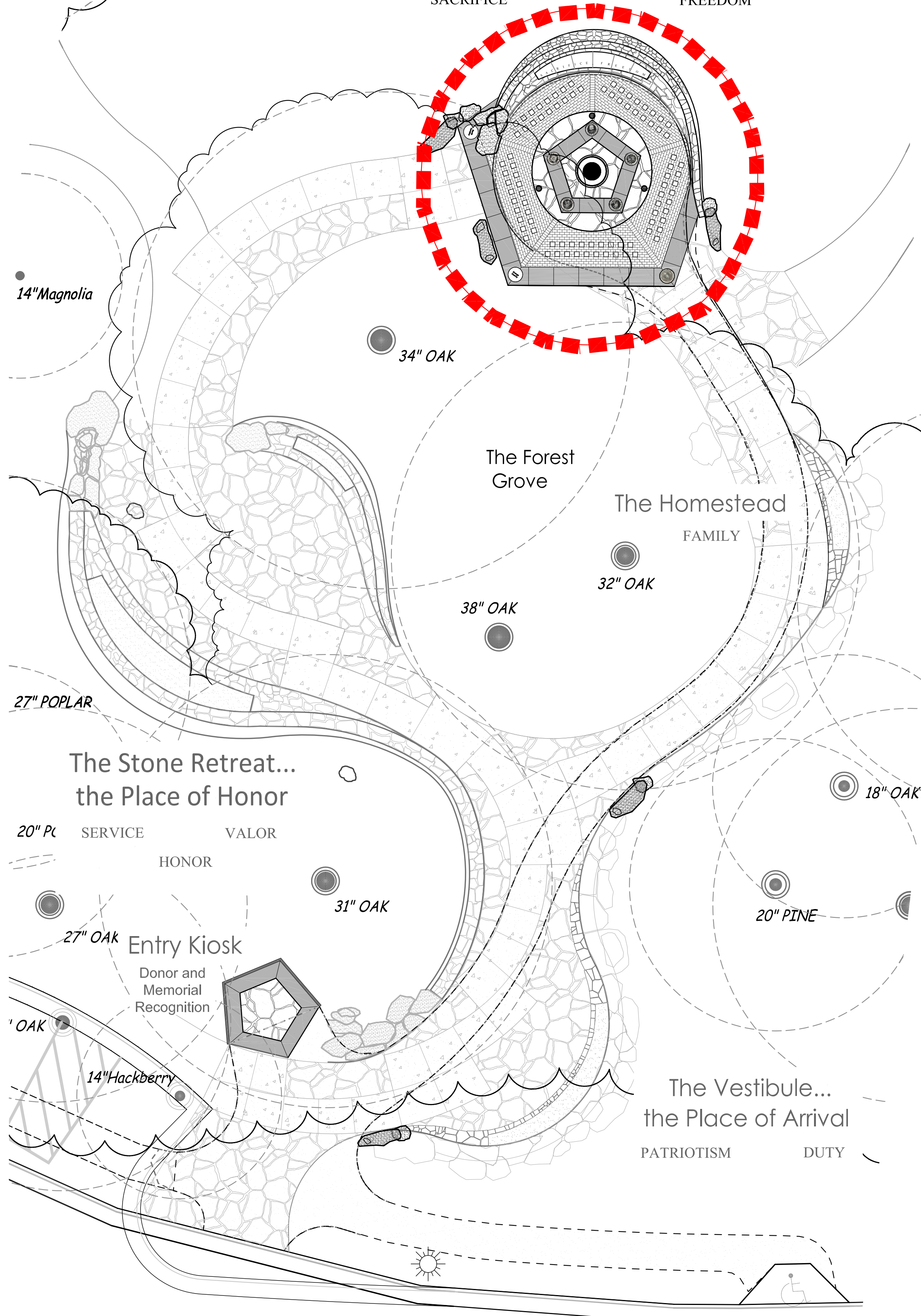




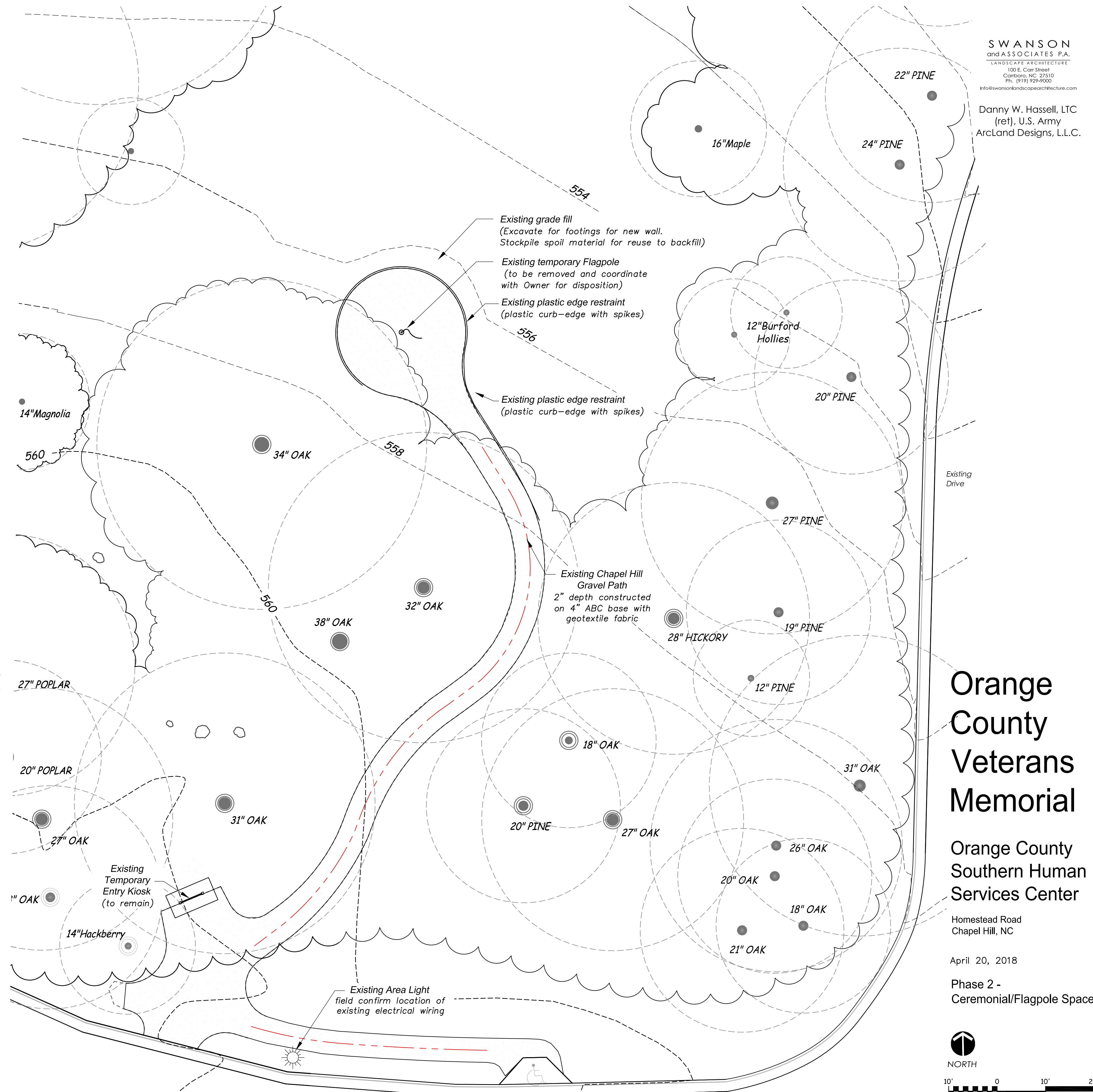
# Orange County Veterans Memorial

## The Ceremonial Circle the Flagpole

SACRIFICE FREEDOM



Site Plan showing Phase 2 with Future Buildout



Existing Conditions as of Spring, 2018

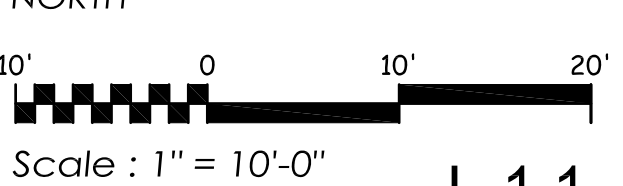
# Orange County Veterans Memorial

Orange County Southern Human Services Center

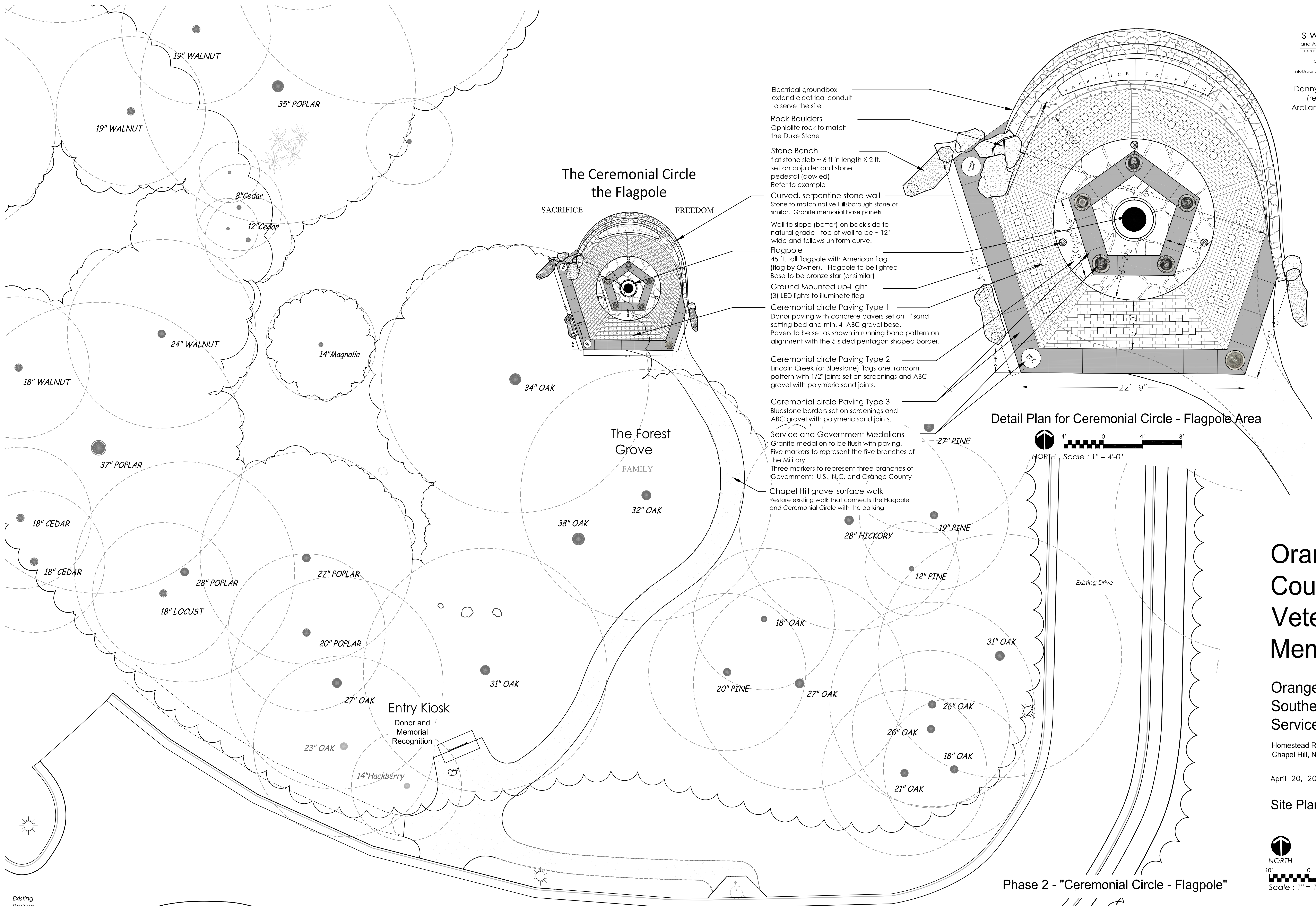
Homestead Road  
Chapel Hill, NC

April 20, 2018

Phase 2 -  
Ceremonial/Flagpole Space







Electrical groundbox  
extend electrical conduit  
to serve the site

Rock Boulders  
Ophiolite rock to match  
the Duke Stone

Stone Bench  
flat stone slab ~ 6 ft in length X 2 ft.  
set on boulder and stone  
pedestal (dowled)  
Refer to example

Curved, serpentine stone wall  
Stone to match native Hillsborough stone or  
similar. Granite memorial base panels

Wall to slope (batter) on back side to  
natural grade - top of wall to be ~ 12'  
wide and follows uniform curve.

Flagpole  
45 ft. tall flagpole with American flag  
(flag by Owner). Flagpole to be lighted  
Base to be bronze star (or similar)

Ground Mounted up-Light  
(3) LED lights to illuminate flag

Ceremonial circle Paving Type 1  
Donor paving with concrete pavers set on 1" sand  
setting bed and min. 4" ABC gravel base.  
Pavers to be set as shown in running bond pattern on  
alignment with the 5-sided pentagon shaped border.

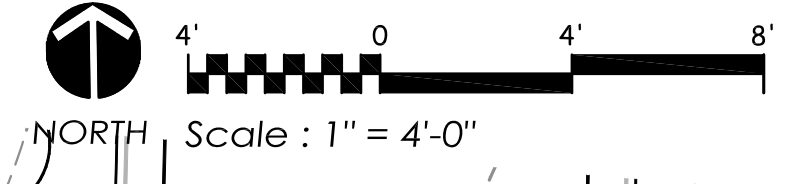
Ceremonial circle Paving Type 2  
Lincoln Creek (or Bluestone) flagstone, random  
pattern with 1/2" joints set on screenings and ABC  
gravel with polymeric sand joints.

Ceremonial circle Paving Type 3  
Bluestone borders set on screenings and  
ABC gravel with polymeric sand joints.

Service and Government Medallions  
Granite medallion to be flush with paving.  
Five markers to represent the five branches of  
the Military  
Three markers to represent three branches of  
Government; U.S., N.C. and Orange County

Chapel Hill gravel surface walk  
Restore existing walk that connects the Flagpole  
and Ceremonial Circle with the parking

Detail Plan for Ceremonial Circle - Flagpole Area



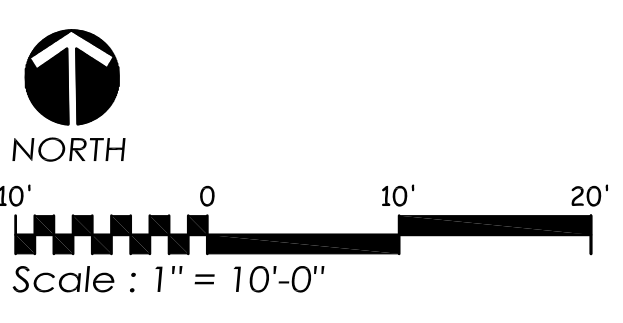
# Orange County Veterans Memorial

Orange County  
Southern Human  
Services Center

Homestead Road  
Chapel Hill, NC

April 20, 2018

Site Plan



Phase 2 - "Ceremonial Circle - Flagpole"



**Site Work Guidelines**

The tree protection fencing and silt fencing should be installed prior to deconstruction, demolition and the grading operations and continue until all major construction and utility work has been completed.

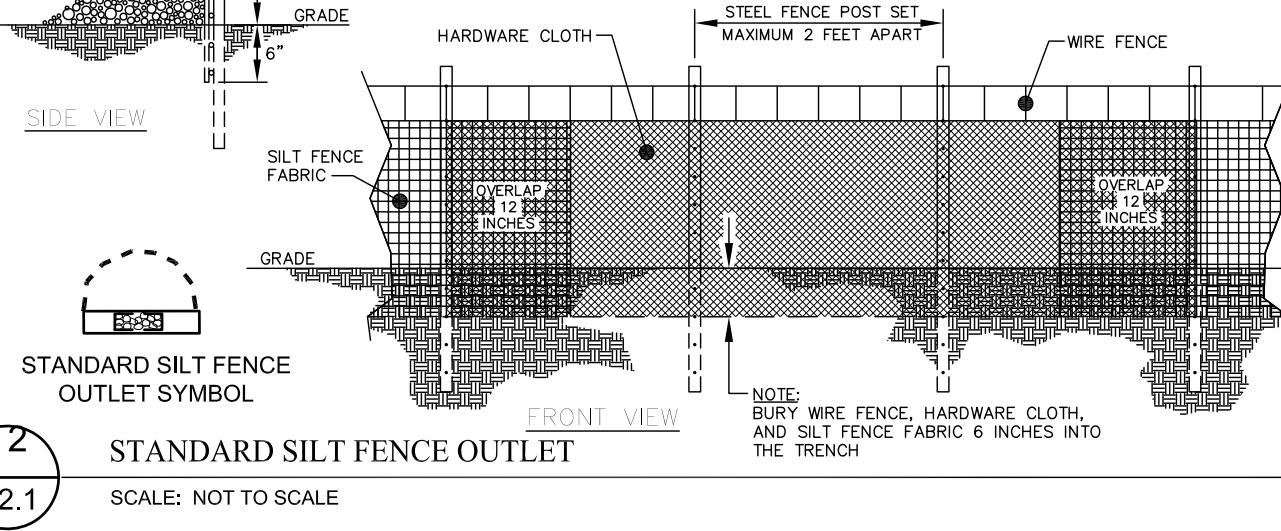
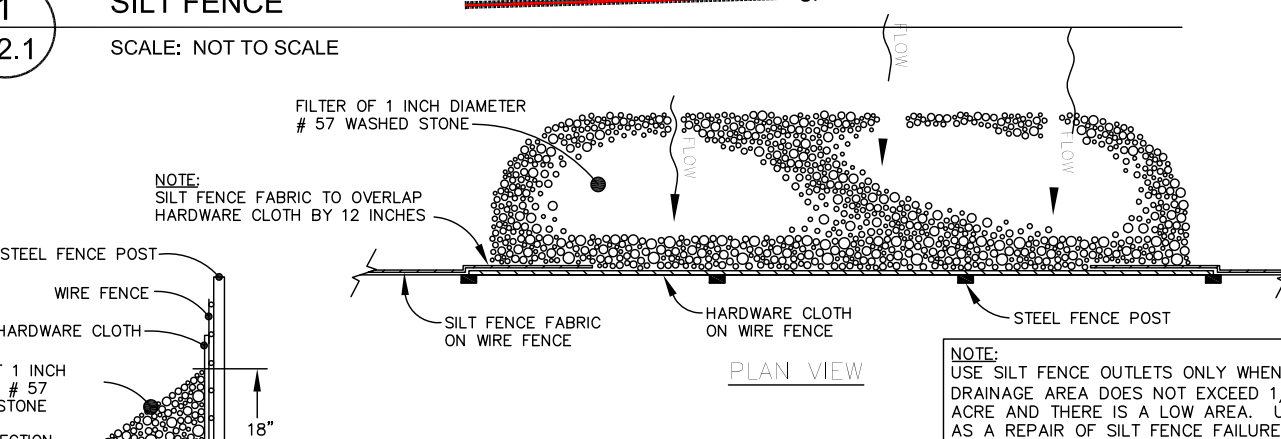
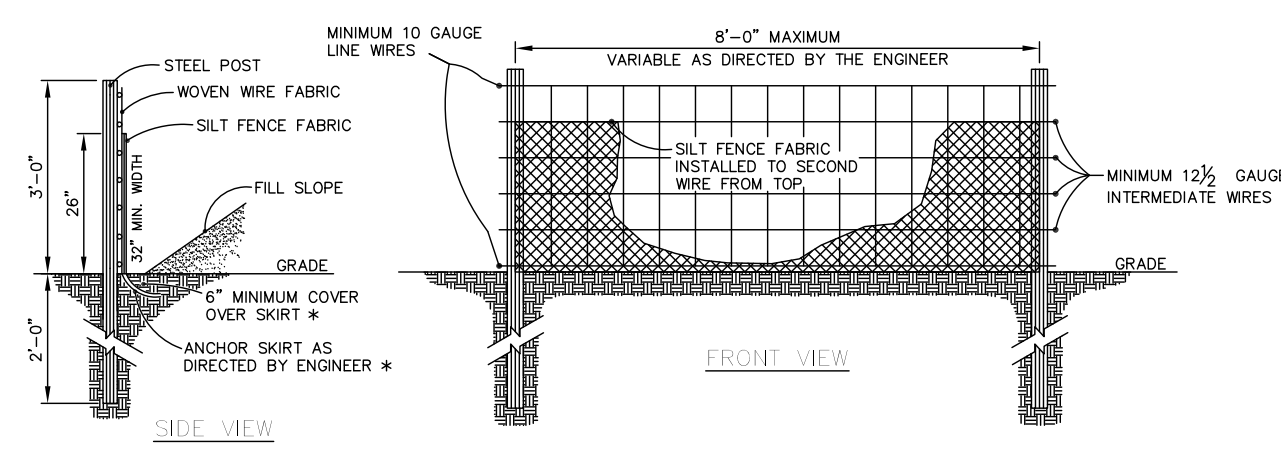
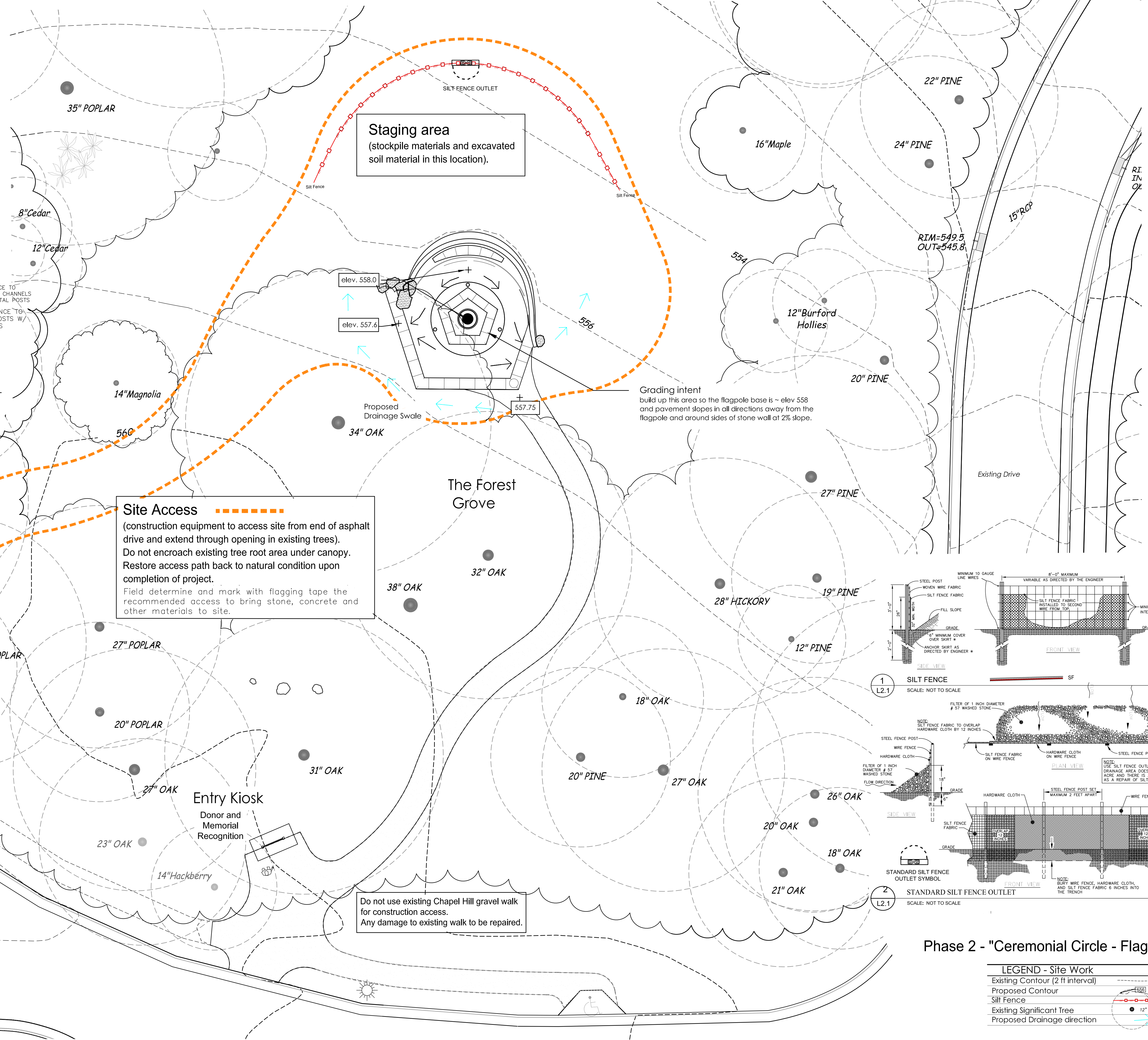
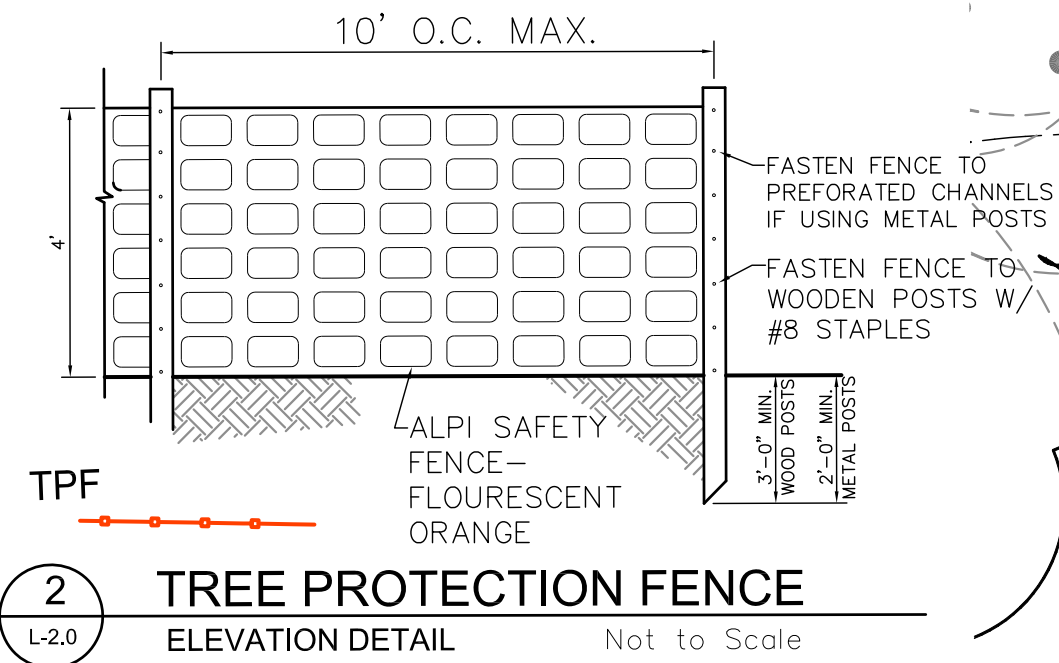
Contact appropriate utility companies and protect existing utility connections.

**Tree Protection Notes**

- Any tree roots exposed by construction shall be severed cleanly with a pruning tool.
- Do not dispose of any chemicals or remove soil outside the limit of work.
- When installing new landscape plants, do not drive equipment upon or disturb the soil within the critical root zone of existing trees.
- A preconstruction conference must be held before any site work begins.

**Construction Sequence**

- Obtain appropriate permits.
- Hold preconstruction conference.
- Erect tree protection fencing—flagging before substantial work with any equipment an/or utility work. Install soil and erosion control measures.



**Phase 2 - "Ceremonial Circle - Flagpole"**

**LEGEND - Site Work**

- Existing Contour (2 ft interval)
- Proposed Contour
- Silt Fence
- Existing Significant Tree
- Proposed Drainage direction

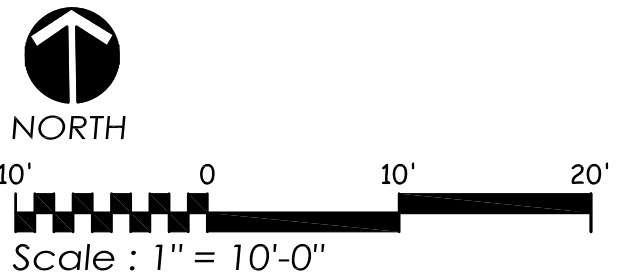
# Orange County Veterans Memorial

## Orange County Southern Human Services Center

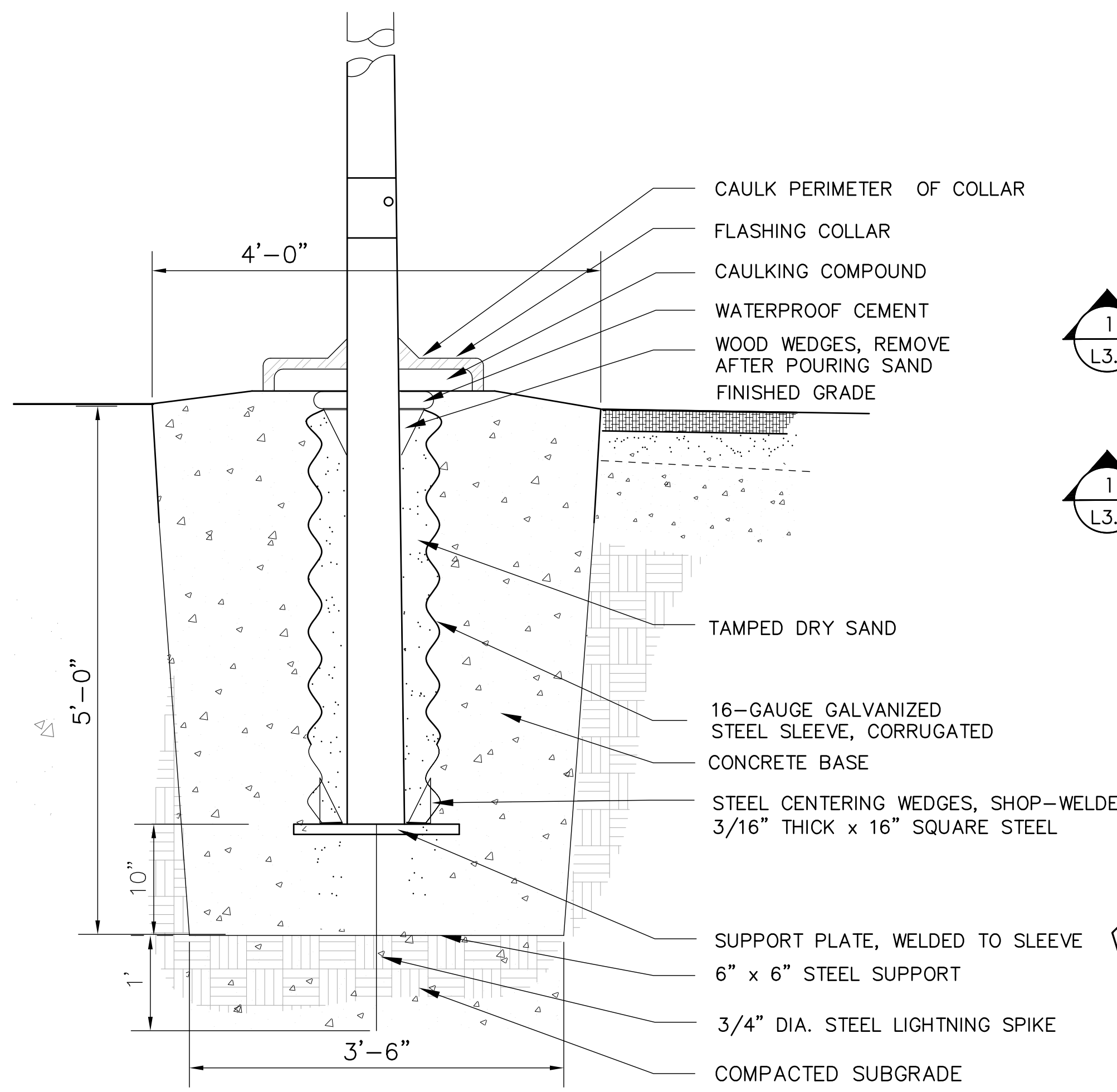
Homestead Road  
Chapel Hill, NC

April 20, 2018

### Grading Plan Site Access Plan



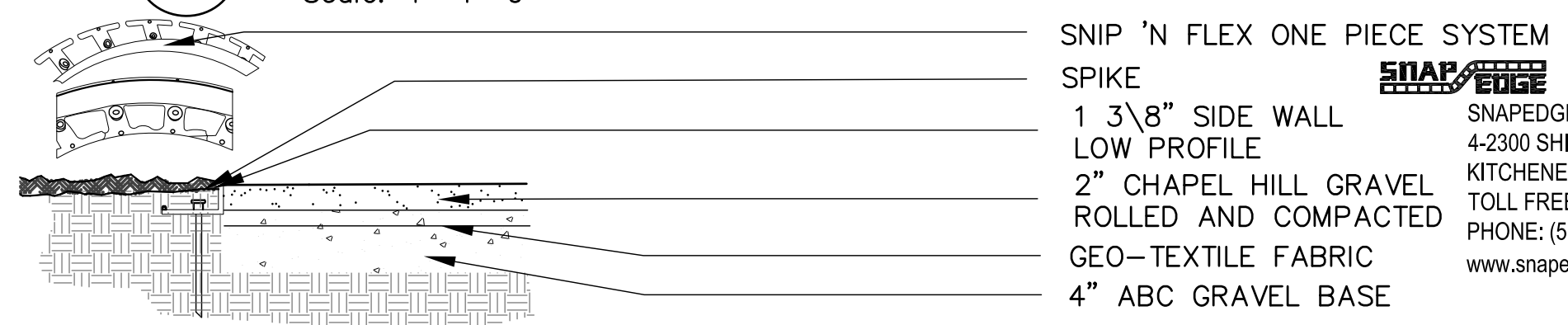




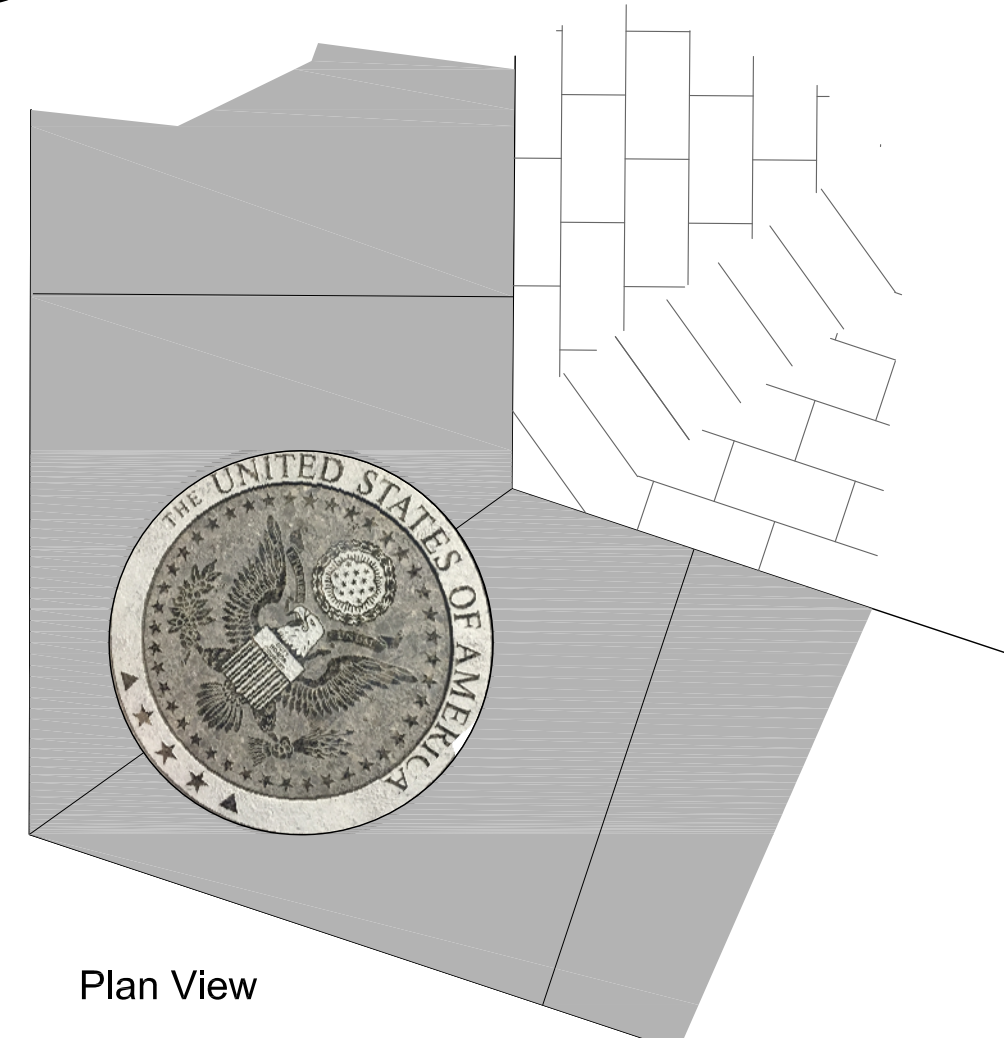
- 1 L3.0 Flagstone Paving
- Bluestone Full Range (alt. Lincoln Creek) Irregular/Random 2" thickness paver with 1/2" joint
- 1 L3.0 Flagpole
- 45 ft. height Flagpole
- Flagpole Footing 4' dia. X 5' depth

- 2 L3.1 Grey Granite Panels
- Template for panel to taken
- Panels to be 1.25" thick.

1 L3.0 Flagpole Footing  
Scale: 1"=1'-0"



2 L3.0 Gravel Walk and Edging  
Scale: 1"=1'-0"



- 4 L3.0 Stone Benches
- ~6" thick stone bench to be doweled into bench support. Bench to be 16" height (typ).
- 3 L3.0 Ground Mounted Uplights
- (3) LED lights to illuminate the flag.
- 3 L3.0 Bluestone Edging Border
- 2" thick set on concrete slab base - Flame finish
- 2'-6" X 3'-5 1/8" (typ). 1/2" joint
- 3 L3.0 Concrete Paver (Donor Pavers)
- Set pavers on 2" sand setting bed with min. 4" ABC gravel base. Set pavers with handtight joints in running bond pattern as shown. Allow spacing for 8X8 Donor Pavers. Paver Divider equal as shown on intersection of pentagram.

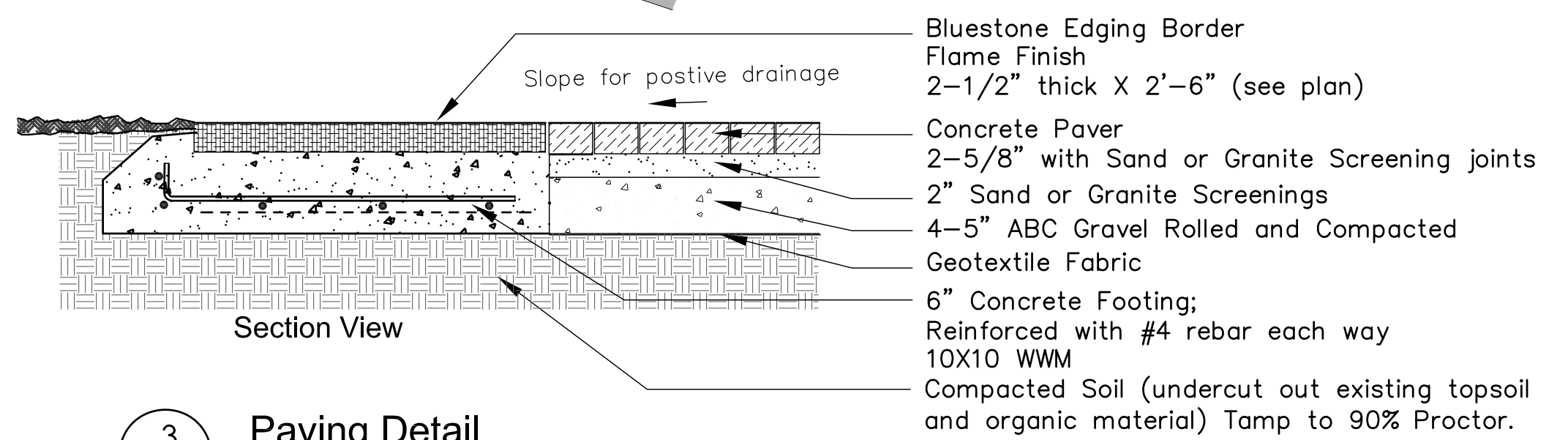
# Orange County Veterans Memorial

Orange County Southern Human Services Center

Homestead Road  
Chapel Hill, NC

April 20, 2018

Detail Plan

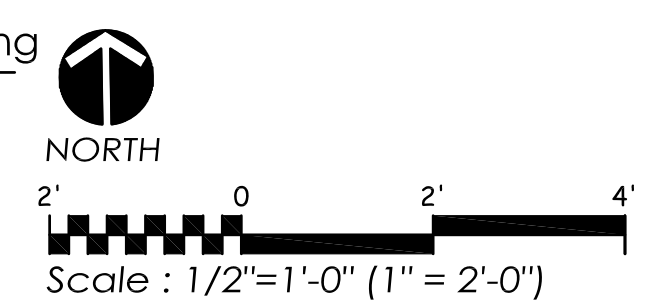


3 L3.0 Paving Detail  
Scale: 1"=1'-0"



4 L3.0 Stone Bench Precedent Example  
Scale: n.t.s.

- 3 L3.0 Granite Medallion
- flush with border paver
- 2 ft. dia. X 2" thick.
- Allow for 3/8" joint
- 3 L3.0 Chapel Hill Gravel Paving
- 2" depth over 4" ABC base with Snap Edge to contain the gravel



L-3.0





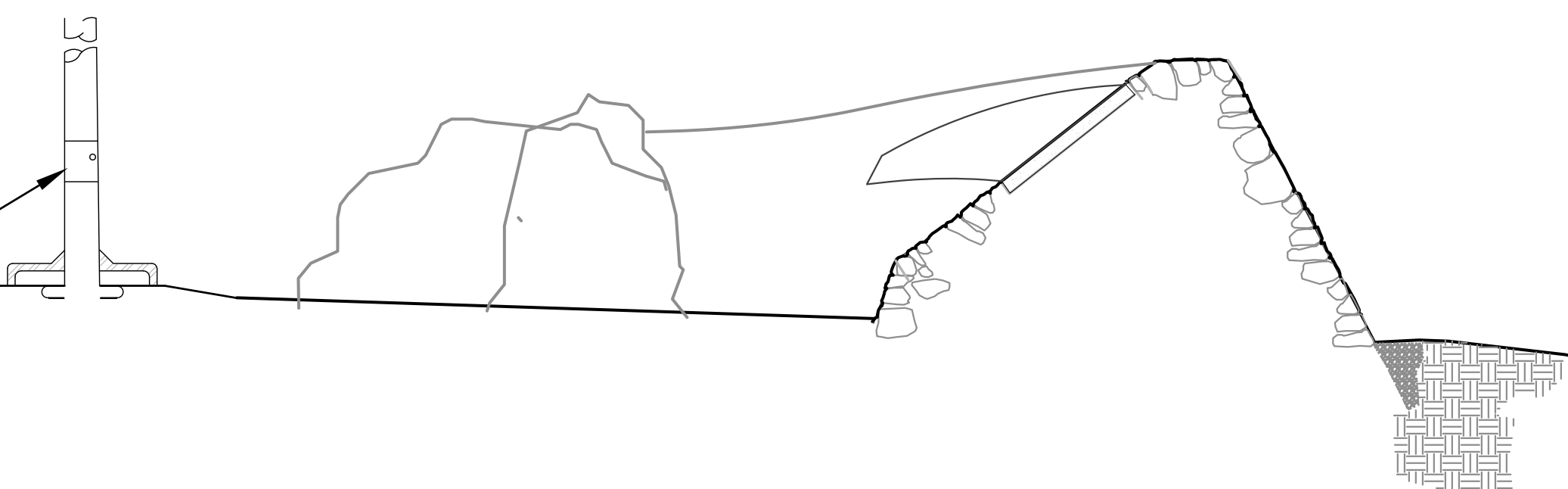
Flagpole Base (precedent example)

**Flagpole**  
min. 50 ft. tall flagpole mounted per manufacturer recommendation. Pole to have internal halyard with both American and N.C. flags. Flagpole to be lighted Base to be bronze star (or similar)

**Ceremonial circle**  
Donor paving to be 4x8 concrete paver blocks and 8x8 Donor Pavers. Concrete pavers to be set on min. 4" ABC base with 2" sand setting bed/screenings with hand-tight joints

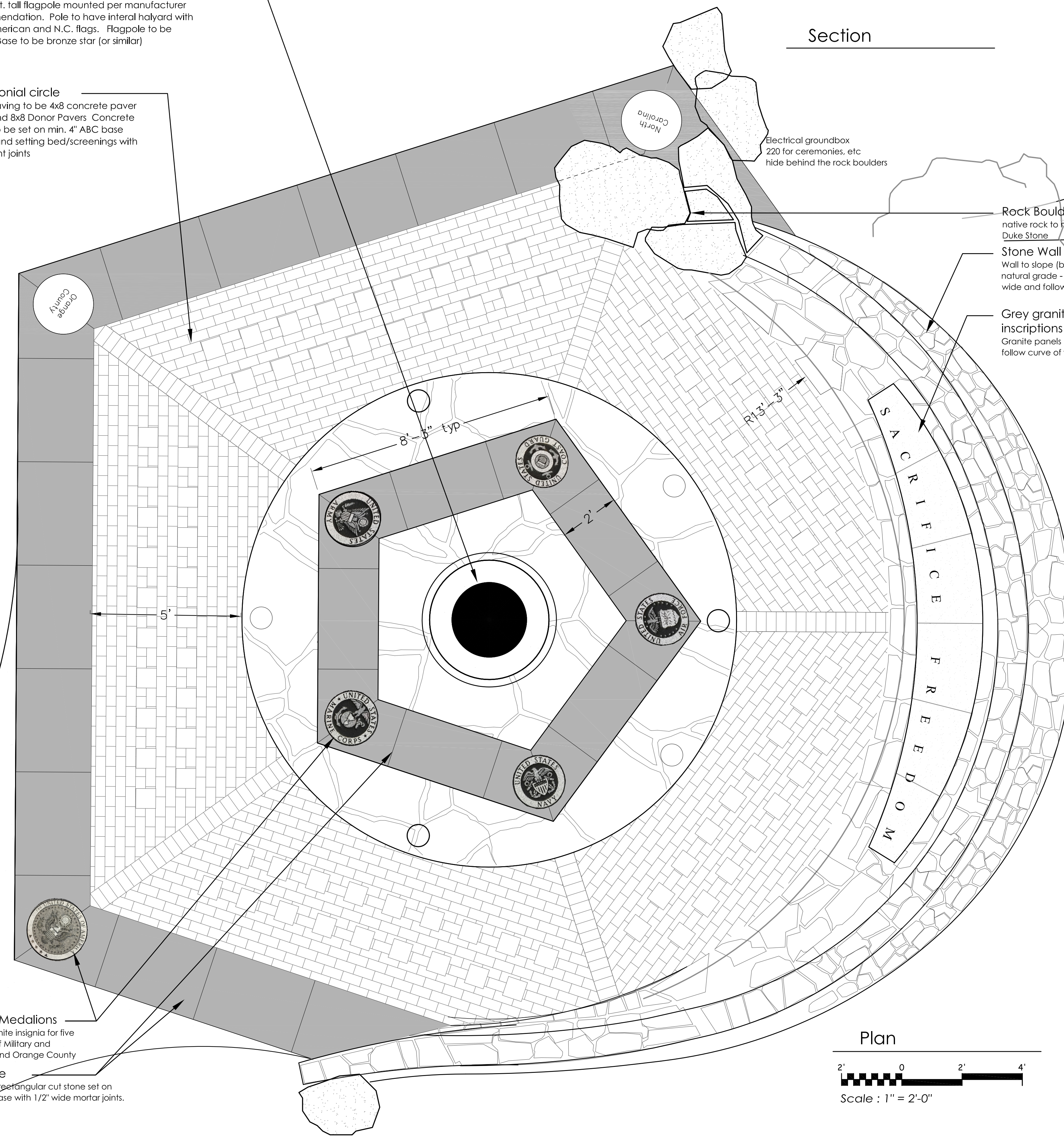
**Granite Medallions**  
2" thick granite insignia for five branches of Military and U.S., N.C. and Orange County

**Bluestone**  
1-1/2" thick rectangular cut stone set on concrete base with 1/2" wide mortar joints.

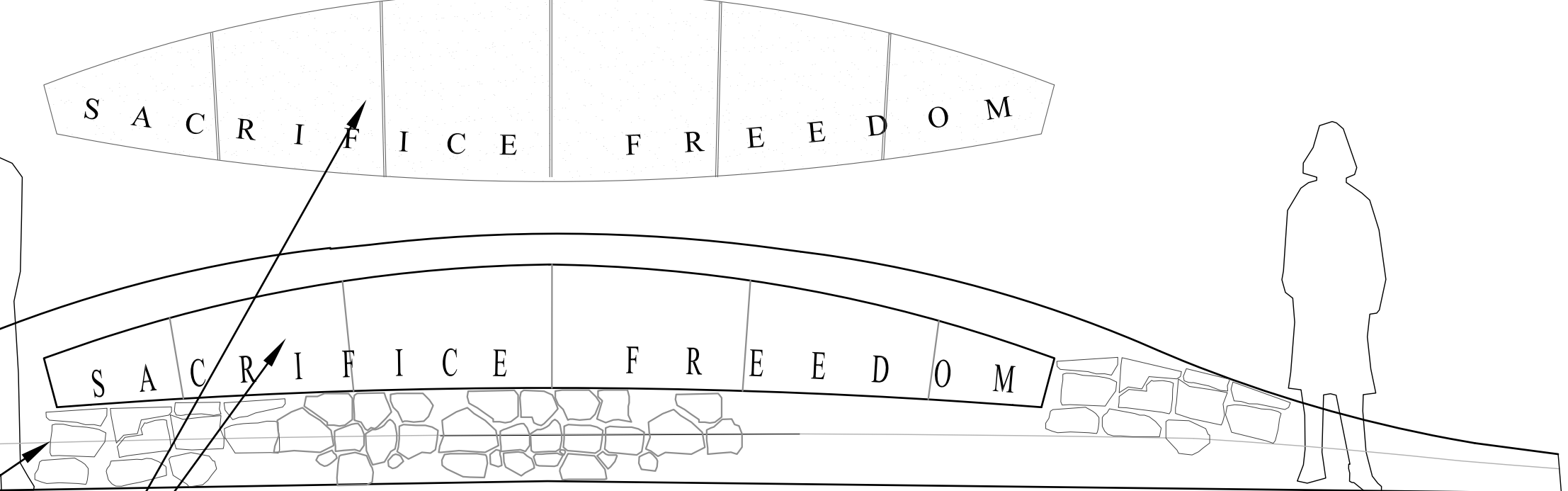


Precedent Example of stone work  
Duke stone coursing and inset hidden joints with fully mortared cap.

Section



Plan  
Scale: 1" = 2'-0"

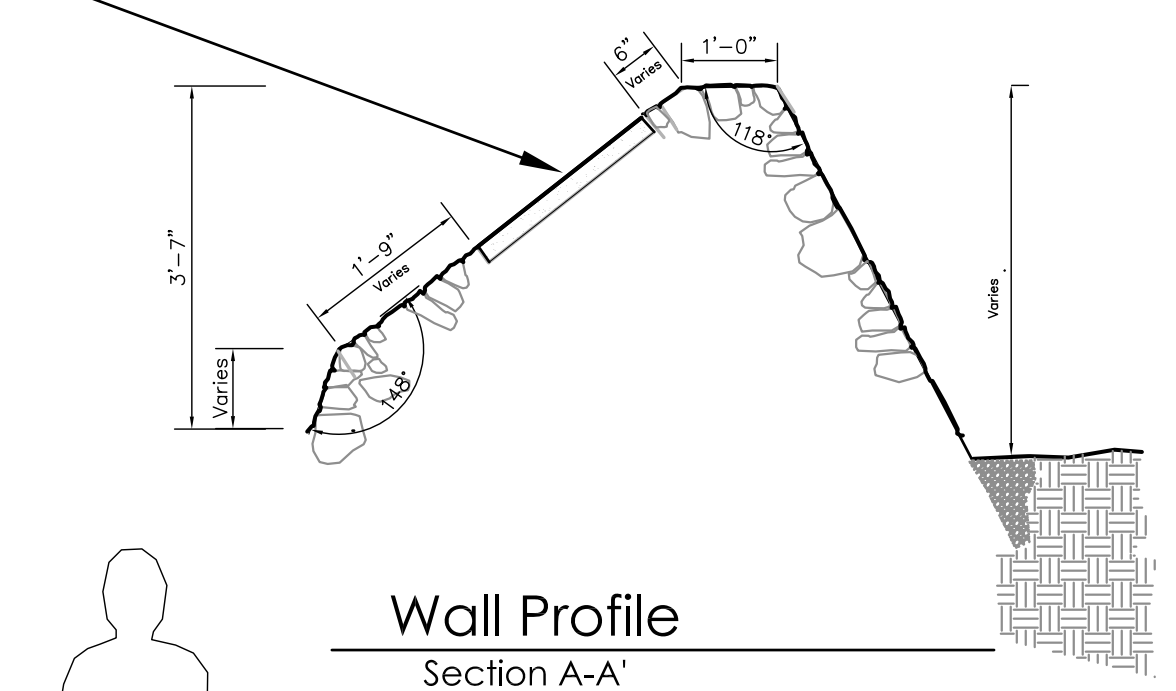


1 Wall Elevation  
Scale: 1" = 1'-0"

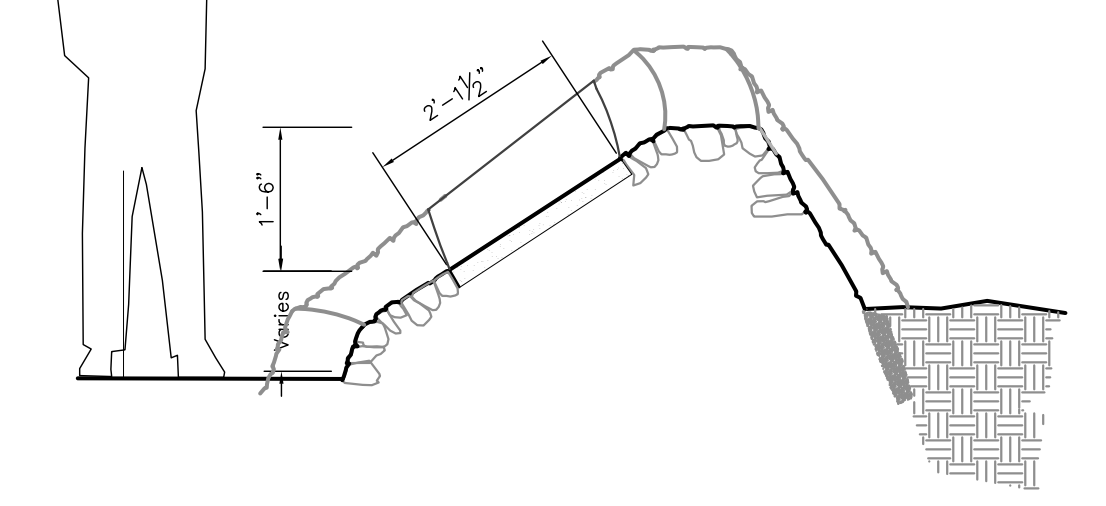
**Rock Boulder**  
native rock to match the Duke Stone

**Stone Wall**  
Wall to slope (batter) on back side to natural grade - top of wall to be ~ 12" wide and follows uniform curve.

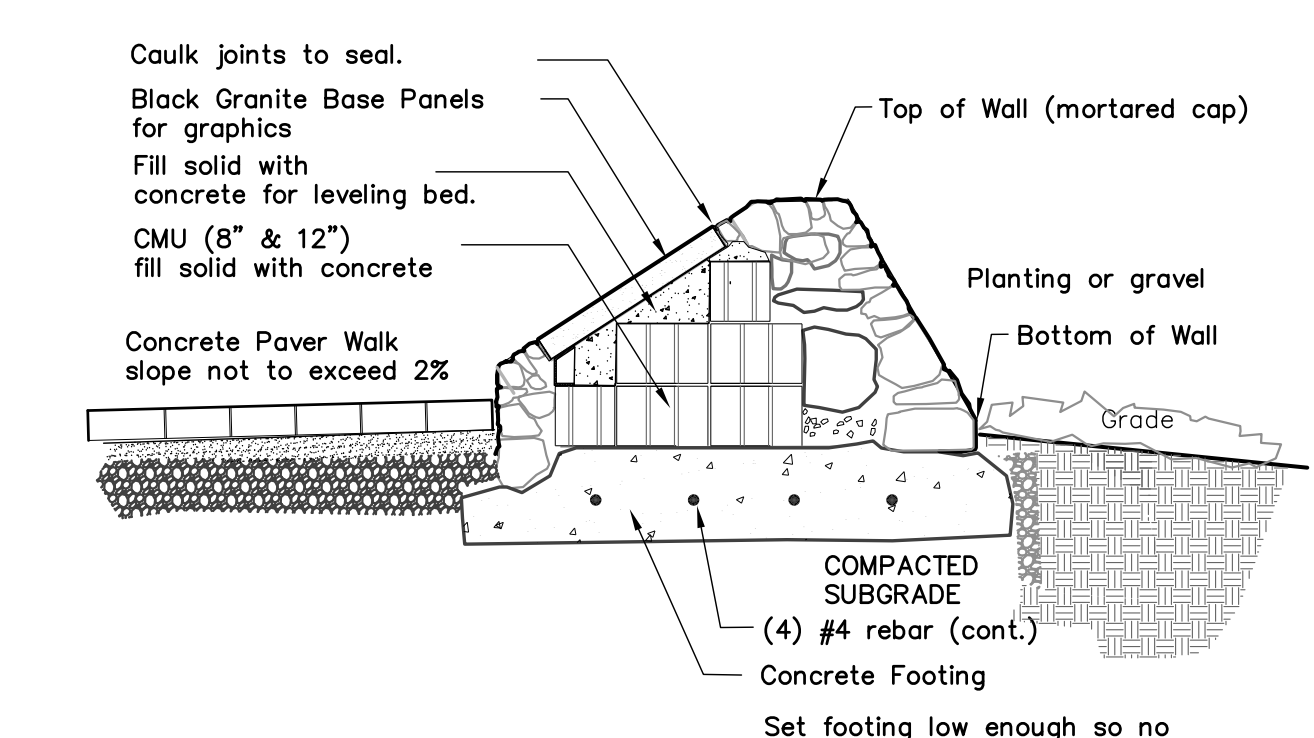
**Grey granite panel for inscriptions and quotes.**  
Granite panels to be in segments to follow curve of wall.



Wall Profile  
Section A-A'



Wall Profile  
Section B-B'



2 Wall Section  
Scale: 1" = 1'-0"

**General Notes:**

Stone to match the native Hillsborough 'Duke' Stone stone with flat surfaces. Coursing to be horizontal pattern. Refer to precedent example photos. Build mock-up and/or provide example wall for approval.

Stone wall cap to be set in mortar and sloped to shed water. Provide anchor rocks to 'tie' in the smaller rocks. Set internal portion of the wall with mortar with the dry laid look from the outside.

Flat surfaced faced rock. Maintain about 1/2" wide mortar joints. Use type 'S' mortar. Recess joints by ~ 1/2" and rub clean. Do not allow extra wide areas of mortar to show.

# Orange County Veterans Memorial

## Orange County Southern Human Services Center

Homestead Road  
Chapel Hill, NC

April 20, 2018

### Details





# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number:**19-139

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

**TITLE:**

Tourism Development Authority's Annual Report to the Board of Aldermen

**PURPOSE:** The purpose of this agenda item is to update the Board on the activities of the TDA this past year and to gather input for the upcoming FY 2019-20 budget process.

**DEPARTMENT:** Economic and Community Development

**CONTACT INFORMATION:** Annette Stone, AICP Economic and Community Development Director  
(919) 918-7319

**INFORMATION:** TDA Board members will be present to discuss accomplishments of the TDA in the FY 2018-19 budget year and provide the final audit for the fiscal year ending in 2018. In addition the TDA would like to gather feedback from the Board of Aldermen for the FY 2019-20 budget process.

**FISCAL & STAFF IMPACT:** Fiscal and staff impacts are presented in the attached report.

**RECOMMENDATION:** Staff recommends the Board receive the report.

# Carrboro Tourism Development Authority

2018-2019 Report





## Section 8A-4. Distribution and Use of Tax Revenues.

- The town shall, on a quarterly basis, remit the net proceeds of the occupancy tax to the Carrboro Tourism Development Authority (CTDA). The CTDA shall use at least two-thirds of the funds remitted to it under this section to promote travel and tourism in Carrboro and shall use the remainder for tourism-related expenditures.
- Promote travel and tourism. To advertise or market an area or activity, publish and distribute pamphlets and other materials, conduct market research, or engage in similar promotional activities that attract tourists or business travelers to the area. The term includes administrative expenses incurred in engaging in these activities.
- Tourism-related expenditures. Expenditures that, in the judgment of the CTDA, are designed to increase the use of lodging facilities, meeting facilities, and convention facilities in the town by attracting tourists or business travelers to the town. The term includes tourism-related capital expenditures.



# 300 East Main Parking Deck - \$45,000





# Carrboro Festivals and Events - \$32,200

- Carrboro Film Festival
- Poetry Festival
- Carrboro Music Festival
- Freight Train Blues



# Community Events - \$18,500

- ArtsCenter Concert Series \$ 6,500
- Terra Vita Food and Wine \$4,000
- Latino Festival \$5000
- Florafitti at \$500
- Bazaar Craft Market \$2500





# Wayfinding

Reimbursed Town  
\$53,000 for Wayfinding  
Design and Construction  
Details



# Hampton Inn and Suites

	Orange County 2017	Orange County 2018	Carrboro Hampton 2017	Carrboro Hampton 2018
Occupancy	68.2%	66%	76.36%	72.28%
Average Daily Rate	\$122.14	\$126.14	\$144.06	\$143.50

“The Triangle was our #1 feeder last year with almost 4000 room nights, followed by Charlotte, Washington, D.C., Atlanta and then the Triad.”

New hotel construction delayed until further notice



# Current Priorities

- Advertising strategies
  - Content creation
    - Videos
    - Feature stories
    - Photography
  - Regular social media post
  - Webpage
  - New Banners in the Downtown
  - Update Bus Wrap – Bus Advertising
  - Updating Historic Walking Tour
    - <https://nc-carrboro2.civicplus.com/DocumentCenter/View/845>





# Visitors Webpage

- [Visit Hillsborough](#)





# Recommended Funding for 2019-20

- Fully funding Town Signature Events \$91,900
- Continued support of the parking lease with East Main Sq. \$45,000
- Continued support for Community Events \$19,000
- Digital media advertising presence with new website, professional social media post, updating It's Carrboro Video! \$25,000
- Wayfinding Signage Implementation \$50,000





# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number:**19-143

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

### **TITLE:**

Review and Acceptance of the 2019 Annual Report on the Schools Adequate Public Facilities Ordinance (SAPFO) from the Technical Advisory Committee

**PURPOSE:** The Orange County Board of County Commissioners has referred the 2019 report for review. The Board of Commissioners has requested comments from partner local governments by April 22nd. A resolution that accepts the report has been attached. The Board may choose to attach comments if desired.

**DEPARTMENT:** Planning

**CONTACT INFORMATION:** Patricia McGuire - 919-918-7327; [pmcguire@townofcarrboro.org](mailto:pmcguire@townofcarrboro.org)  
<<mailto:pmcguire@townofcarrboro.org>>

**INFORMATION:** The letter from Chair Penny Rich, of the Board of County Commissioners requesting Board of Aldermen review of the 2019 Draft Annual Report on the Schools Adequate Public Facilities Ordinance (SAPFO) Technical Advisory Committee was received on March 25th. The transmittal included an executive summary of the report and copy of the BOCC's agenda abstract from March 19th (*Attachment B*). The full report is attached (*Attachment C*) and may also be found on Orange County's Planning Department website at the following link: <https://www.orangecountync.gov/departments/1722/Current-Interest-Projects>. Annual reporting requirements of the SAPFO are spelled out in Section 1D of the Memorandum of Understanding (MOU). The annual report addresses five areas for each of the two school systems, Level of Service, Building Capacity and Membership, Membership Date, Capital Improvement Planning, Student Membership Projection methodology, and Student Membership Projections. Excerpts from the report related to the Chapel Hill Carrboro City Schools are included below.

**Chapel Hill Carrboro City Schools (CHCCS) Summary Information.** The CHCCS school district does not exceed the adopted levels of service established in the SAPFO. Projections do not show a need for new additional capacity at the elementary, middle, or high school levels within the 10-year planning period. Work to renovate and expand existing CHCCS facilities continue. Within the district, the total number of students increased by 54 students as a result of 51 fewer elementary students, 100 more middle school students and 5 more high school students. The total school population in the 2018-19 school year is 12,336. Level of Service for the three school levels is summarized below:

**Elementary.** The student population does not exceed 105 percent LOS standard (current LOS is 96.6 percent). Projections do not show the need for an additional Chapel Hill/Carrboro Elementary School in the 10 year

projection period.

**Middle School.** The student population does not currently exceed 107 percent LOS standard (current LOS is 99.6 percent). Projections do not show the need for an additional Chapel Hill/Carrboro Middle School in the 10-year projection period.

**High School.** The student population does not currently exceed the 110 percent LOS standard (current LOS is 101.5 percent). Renovations underway at Chapel Hill High School will result in an increase in capacity of 105 seats for the 2020-2021 school year. The need for additional capacity at the high school level is not anticipated in the 10-year projection period.

**Student Projection Analysis.** Projected average annual growth rates at the elementary and middle school levels have decreased slightly, but remain positive. Future growth rates show decreasing rates of growth at the elementary, middle school and high school levels.

**Other Considerations.** 2017 legislation established new student class sizes for kindergarten to third grade. House Bill 90 includes a staggered implementation of the reduction, to be completed by 2021-2022, as follows:

School Year	Ratio of classrooms to # of students
2019-2020	1:19
2020 - 2021	1:18
2021-2022	1:17

These changes in classroom size are projected to result in capacity issues for the 2021-2022 school year. The Schools Joint Action Committee is meeting to consider options and incorporation of the changes into the student membership and building capacity projections. This year’s draft report notes the increase in multi-family residential projects in the district, especially in the Town of Chapel Hill. Proposed growth is not included in the SAPFO projection process until actual student enrollment occurs and certificates of adequate public facilities are required during the review process for new developments. Staff continue to monitor the growth and associated demand in relation to student membership rates. The report also includes information regarding charter schools and other alternative schooling arrangements as the schools are monitored in relation to effects on student enrollment in both districts. For funding purposes, the North Carolina Department of Public Instruction provides pupil information from such schools to Orange County. Information on charter schools related to Orange County Schools is provided on page 33 of the report.

The Adequate Public School Facilities provisions, Land Use Ordinance subsections 15-88 through 15-88.7, and the associated memorandum of understanding is provided as information (*Attachment D*). A memo providing the status of CAPS for approved residential developments is included as *Attachment E*.

**FISCAL & STAFF IMPACT:** None noted with the review and acceptance of this report.

**RECOMMENDATION:** Staff recommends that the Board of Aldermen adopt the attached resolution that accepts the report. The Board may choose to attach comments if desired.

**ATTACHMENT A**

The following resolution was introduced by Aldermen \_\_\_\_\_ and duly seconded by Aldermen \_\_\_\_\_.

**A RESOLUTION ACCEPTING THE SCHOOLS ADEQUATE PUBLIC FACILITIES TECHNICAL ADVSIORY COMMITTEE (SAPFOTAC) 2019 REPORT**

**WHEREAS**, the Town has had a longstanding interest in the success and excellence of the Chapel Hill – Carrboro City Schools; and

**WHEREAS**, the Town has participated in the development and implementation of the schools adequate public facilities ordinance provisions since 2003; and

**WHEREAS**, the annual technical advisory committee report has been prepared and distributed for review.

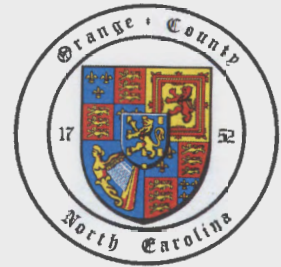
**NOW, THEREFORE BE IT RESOLVED** that the Board of Aldermen of the Town of Carrboro accepts the report.

This the 9th day of April in the year 2019.



PENNY RICH, CHAIR  
RENEE PRICE, VICE CHAIR  
JAMEZETTA BEDFORD  
MARK DOROSIN  
SALLY GREENE  
MARK MARCOPLOS  
EARL MCKEE

**Orange County Board of Commissioners**  
**Post Office Box 8181**  
**200 South Cameron Street**  
**Hillsborough, North Carolina 27278**



March 20, 2019

Pam Hemminger, Mayor  
Town of Chapel Hill  
405 Martin Luther King Jr. Blvd.  
Chapel Hill, NC 27514

Brenda Stephens, Chair  
Orange County Board of Education  
200 E. King Street  
Hillsborough, NC 27278

**Lydia Lavelle**, Mayor  
Town of Carrboro  
301 W. Main Street  
Carrboro, NC 27510

Joal Broun, Vice Chair  
Chapel Hill-Carrboro Board of Education  
750 Merritt Mill Road  
Chapel Hill, NC 27516

Tom Stevens, Mayor  
Town of Hillsborough  
P.O. Box 429  
Hillsborough, NC 27278

Subject: Schools Adequate Public Facilities Ordinance Technical Advisory Committee  
(SAPFOTAC) Annual Report

Dear Sir or Madam:

This letter is to update you on the status of the 2019 Annual SAPFOTAC Report. In accordance with the SAPFO Memoranda of Understanding (MOU), the Board of County Commissioners (BOCC) approved the November 15, 2018 actual membership and capacity numbers for Orange County Schools and Chapel Hill – Carrboro City Schools at its meeting on December 11, 2018.

The SAPFOTAC, comprised of representatives of both school systems and the Planning Directors of the County and Towns has produced the 2019 Annual Report. As per the SAPFO MOU, the annual technical report contains information on Level of Service, Building Capacity, Membership Date, Capital Investment Plan, Student Membership Projection Methodology, Student Membership Projections, Student Membership Growth Rate, Student/Housing Generation Rate, and the SAPFO Process. Enclosed for your use are copies of the 2019 Executive Summary and the March 19, 2019 BOCC meeting agenda item abstract when the BOCC received the draft report.

The full draft SAPFOTAC report is available on the Orange County Planning Department website in the Current Interest Projects section at the following link: <https://www.orangecountync.gov/1722/Current-Interest-Projects>.

The 2019 Annual SAPFOTAC Report is scheduled to be certified by the BOCC at a regular meeting in May 2019. Therefore, if you have any comments pertaining to the report, please forward them to Craig N. Benedict, Planning Director, no later than 5:00 p.m. on **April 22, 2019**. Mr. Benedict can be reached by phone at (919) 245-2592 or by e-mail at [cbenedict@orangecountync.gov](mailto:cbenedict@orangecountync.gov). Any comments received will be part of our agenda package in May.

Please share this information and the 2019 SAPFOTAC report with your respective boards.

Sincerely,



Penny Rich  
Chair

Enclosures

cc: Board of County Commissioners

Bonnie Hammersley, Orange County Manager  
Travis Myren, Deputy Orange County Manager  
Maurice Jones, Manager, Town of Chapel Hill  
David Andrews, Manager, Town of Carrboro  
Eric Peterson, Manager, Town of Hillsborough  
Pamela Baldwin, Superintendent, Chapel Hill-Carrboro City Schools  
Todd Wirt, Superintendent, Orange County Schools  
Patrick Abele, Assistant Superintendent for Support Services, Chapel Hill-Carrboro City Schools  
Catherine Mau, Coordinator for Student Enrollment, Chapel Hill-Carrboro City Schools  
Michelle Dodson, Student Assignment and Student Transfers, Orange County Schools  
Craig Benedict, Planning Director, Orange County  
Ben Hitchings, Planning and Development Services Director, Town of Chapel Hill  
Margaret Hauth, Planning Director, Town of Hillsborough  
Trish McGuire, Planning Director, Town of Carrboro

**ORANGE COUNTY  
BOARD OF COMMISSIONERS  
ACTION AGENDA ITEM ABSTRACT  
Meeting Date: March 19, 2019**

**Action Agenda  
Item No. 8-d**

**SUBJECT:** Schools Adequate Public Facilities Ordinance (SAPFO) – Receipt and Transmittal of 2019 Annual Technical Advisory Committee Report

---

**DEPARTMENT:** Planning and Inspections

---

**ATTACHMENT(S):**

1. SAPFO Partners Transmittal Letter
2. Draft 2019 SAPFOTAC Annual Report and Larger Scale Projection Worksheets

**INFORMATION CONTACT:**

Ashley Moncado, Planner II, 919-245-2589  
Craig Benedict, Director, 919-245-2575

---

**PURPOSE:** To receive the 2019 Annual Report of the SAPFO Technical Advisory Committee (SAPFOTAC) and transmit it to the SAPFO partners for comments before certification in May.

**NOTE:** The School Capacity Capital Investment Plan (CIP) Needs Analysis projects no new school capacity needs in the next 10 years for elementary, middle and high school levels for both Orange County Schools (OCS) and Chapel Hill-Carrboro City Schools (CHCCS).

**ADDITIONAL NOTE:** In 2018, the North Carolina General Assembly unveiled House Bill 90 which allows for a phasing-in process to address the decrease in class size averages over the next three school years. Based on House Bill 90, average class sizes for kindergarten to third grade will be phased-in as provided below:

2019 – 2020	1:19
2020 – 2021	1:18
2021 – 2022	1:17

**Reductions in class size averages are expected to create elementary school capacity issues for the 2021-2022 school year.** In order to address these impacts in time, the Schools Joint Action Committee (SJAC) continues to meet order to review impacts to both school districts, discuss options, and determine how to implement the school capacity changes into the SAPFO annual report and 10-year student membership and building capacity projections sheets.

**ADDITIONAL NOTE:** Charter and private schools are not included as part of the SAPFO Annual Report and, as a result, their membership and capacity numbers are not monitored or included in future projections. SAPFO projections are used for projecting only public school capacity needs. However, the SAPFO Technical Advisory Committee does monitor charter and private schools and their effect on student enrollment in both school districts. Charter and private schools numbers are not collected for SAPFO purposes; however, impacts due to enrollment at these schools are accounted for in SAPFO process with the annual reporting of student membership and growth rates contained in the 10-year student projections.

## **BACKGROUND:**

### **1. Annual Report**

Each year, since 2004, the SAPFOTAC Report is updated to reflect actual changing conditions of student membership and school capacity. This information is analyzed and used to project future school construction needs based on adopted level of service standards. There are two steps to the full report. The first part (Student Membership and Capacity) is certified in the fall and then this full report, in the following spring, is to keep the SAPFO system calibrated. At the December 11, 2018 Board of County Commissioners meeting, the Board approved the November 15, 2018 actual membership and capacity numbers (i.e. first part) for both Orange County Schools (OCS) and Chapel Hill-Carrboro City Schools (CHCCS). A draft of the full annual SAPFOTAC Report is complete and has been reviewed by the SAPFOTAC members.

### **2. SAPFOTAC**

The SAPFOTAC, comprised of representatives of both school systems, the Planning Directors of the County and Towns, and County Finance staff, is tasked to produce an annual report for the governing boards of each SAPFO partner outlining changes in actual membership, capacity, student projections, and their collective impacts on the Capital Investment Plan (CIP) and the future issuance of Certificates of Adequate Public Schools (CAPS). Orange County's Planning Staff compiles the report, holds a meeting discussing the various aspects, and then prepares a draft report, which is reviewed by the SAPFO Technical Advisory Committee.

### **3. Membership Data**

CHCCS total increased from the previous year: 54 students

(51) Elementary School  
100 Middle School  
5 High School

OCS total decreased from the previous year: 25 students

22 Elementary School  
49 Middle School  
(96) High School

( ) denotes decrease

### **4. Capacity Data**

There were no changes to school capacities this year in either school district. Mandated class size changes, discussed in a "Note" on the previous page, are expected to create capacity issues in the 2021-22 school year. Orange County Schools began a capacity reduction process last year in advance. It is suggested that both school districts implement in step to create consistency and timing protocol.

### **5. Capacity Information**

#### **SAPFO vs. DPI**

The SAPFO is a local ordinance, independent of State Department of Public Instruction (DPI) projections and rules regarding class size. The SAPFO, for instance, does not count temporary modular classrooms as fulfilling the capacity level of service outlined in the SAPFO interlocal Memorandum of Understanding (MOU). The MOU requires 'bricks and mortar' instead of temporary facilities and also requires its own set of future student projections to identify long-term capital school construction needs. However, the County did phase in the smaller class size mandates in previous years that decreased capacity.



Decisions will have to be made if new discussions at the state level create any class size changes that should or should not be reflected in the County's SAPFO. Future decisions would reflect the timing and impact of new state legislation.

This year, CHCCS and OCS did not exceed the adopted level of service standards established in the SAPFO, nor do projections show a potential need for additional capacity at the elementary, middle, and high school levels within the 10-year planning period.

## 6. Student Projection Analysis

### CHCCS

Student membership projections show a mix of increases and decreases at all levels within the 10-year planning period. Projections are shown on page 37 of the report.

### OCS

Student membership projections show a mix of increases and decreases at all levels within the 10-year planning period. Projections are shown on page 36 of the report.

The City of Mebane lies partially within Orange County and students within the Orange County portion of Mebane attend Orange County schools. However, Mebane is not a party to the SAPFO agreement and does not require that CAPS be issued prior to development approvals. Although the SAPFO system is not formally regulated in Mebane, students residing within the Orange County portion of Mebane are accounted for in the SAPFO process with the annual reporting of actual student membership and ensuing growth rates contained in the 10-year student projections.

## 7. School Capacity CIP Needs Analysis

### CHCCS

Projected needs:

Elementary School	Projections show no needs in the next 10 years
Middle School	Projections show no needs in the next 10 years
High School	Projections show no needs in the next 10 years

### OCS

Projected needs:

Elementary School	Projections show no needs in the next 10 years
Middle School	Projections show no needs in the next 10 years
High School	Projections show no needs in the next 10 years

NOTE: School capacity changes as part of a school renovation/upgrade project will be reviewed as necessary by the BOCC and school districts.

## 8. Student Generation Rates

The updated student generation rates were approved on May 19, 2015 and are shown in Attachment II.E.1 on page 43 of the report. Updated rates began to be used for CAPS issuances in the fall of 2015 and are based on an inventory of recently built units from January 1, 2004 to December 31, 2013.

## 9. Access to Full Report

The draft SAPFOTAC report will be posted on the Orange County Planning Department's web site. A letter and the Executive Summary of the report will be sent to all SAPFO partners after this BOCC meeting advising them of the availability of the draft report and inviting comment. It is anticipated the draft 2019 SAPFOTAC report will be brought back to the BOCC for certification at the May 21, 2019 regular meeting.

## 10. Additional Information

There are two primary parts to the SAPFO system. The first part, Certificate of Adequate Public Schools (CAPS), is the testing of the student generation rate (SGR) from development projects against available capacity within the schools. The second part, student projections and capacity needs assessment, is the tracking of historical enrollment and the projection of future student enrollment against existing capacity at a certain school level. This part is not directly related to a development project, but a current year outcome of how many children actually 'show up' in a school year. This includes new students that also come from existing housing stock.

The purpose of explaining these two parts of the SAPFO system is to illustrate how projects can be approved as part of the CAPS system when capacity is available yet aberration in actual enrollment can cause future year projections to accelerate capital needs dramatically. The 10-year student projections developed for the SAPFO Annual Report forecast future school needs based on current student membership numbers and historic growth rates derived by the five projection models.

The process accounting for students once they are actually enrolled in the school system emphasizes a delay that exists from the time a residential development is approved and developed to when students begin to enter the system. For example, the proposed residential growth that has occurred in the recent past within Mebane's jurisdiction has yet to be seen with OCS student membership numbers and fully entered into the historically based projection methods. Orange County staff will continue to work with the SAPFO Technical Advisory Committee and our planning partners to monitor future residential development throughout Orange County.

In summary, although the SAPFO Technical Advisory Committee report does not show immediate capital needs, the development approvals in both school districts will, after a normal lag, accelerate capital school needs and renovations based on localized student increases at specific schools. These local impacts will have to be analyzed by the school district to determine the best method to resolve new demands (i.e. redistricting, renovation, new school construction, etc.).

**FINANCIAL IMPACT:** Current student growth projections do not show capacity needs for additional schools in either the CHCCS District or OCS District during the 10-year projection period. The outcome of the School Joint Action Committee related to state legislation may project more immediate capital needs.

**SOCIAL JUSTICE IMPACT:** The following Orange County Social Justice Goal is applicable to this item:

- **GOAL: ENSURE ECONOMIC SELF-SUFFICIENCY**

The creation and preservation of infrastructure, policies, programs and funding necessary for residents to provide shelter, food, clothing and medical care for themselves and their dependents.

**RECOMMENDATION(S):** The Manager recommends the Board:

1. Receive the 2019 SAPFOTAC Annual Report; and
2. Authorize the Chair to sign the transmittal letter to SAPFO partners contained in Attachment 1.



## 2019 SAPFOTAC Executive Summary

### I. Base Memorandum of Understanding

#### A. Level of Service .....(No Change).....Pg. 1

	<i>Chapel Hill/Carrboro School District</i>	<i>Orange County School District</i>
<i>Elementary</i>	105%	105%
<i>Middle</i>	107%	107%
<i>High</i>	110%	110%

#### B. Building Capacity and Membership .....(Change).....Pg. 2

	<i>Chapel Hill/Carrboro School District</i>			<i>Orange County School District</i>		
	Capacity	Membership	Increase from Prior Year	Capacity	Membership	Increase from Prior Year
<i>Elementary</i>	5664	5471	(51)	3361	3205	22
<i>Middle</i>	2944	2933	100	2166	1779	49
<i>High</i>	3875	3932	5	2439	2349	(96)

#### C. Membership Date – November 15.....(No Change).....Pg.17

### II. Annual Update to SAPFO System

#### A. Capital Investment Plan (CIP) .....(No Change).....Pg. 18

#### B. Student Membership Projection Methodology .....(No Change).....Pg. 19 *The average of 3, 5, and 10 year history/cohort survival, linear and arithmetic projection models.*

#### C. Student Membership Projections .....(Change).....Pg. 29

### Analysis of 5 Years of Projections for 2018-19 School Year – Chapel Hill/Carrboro City Schools

(The first column for each year includes the student membership projection made for 2018-19 in that given year. The second column for each year includes the number of students the projection was off compared to actual membership. An "L" indicates the projection was low compared to the actual, whereas an "H" indicates the projection was high compared to the actual.)

	Actual 2018 Membership	Year Projection Made for 2018-19 Membership									
		2013-2014		2014-2015		2015-2016		2016-2017		2017-2018	
<b>Elementary</b>	5471	6021	H550	5795	H324	5622	H151	5655	H184	5509	H38
<b>Middle</b>	2933	3063	H130	3009	H76	2915	L18	2898	L35	2889	L44
<b>High</b>	3932	4011	H79	3920	L12	3842	L90	3846	L86	3915	L17

**Analysis of 5 Years of Projections for 2018-19 School Year – Orange County Schools**

(The first column for each year includes the student membership projection made for 2018-2019 in that given year. The second column for each year includes the number of students the projection was off compared to actual membership. An “L” indicates the projection was low compared to the actual, whereas an “H” indicates the projection was high compared to the actual.)

		Year Projection Made for 2018-19 Membership									
	Actual 2018 Membership	2013-14		2014-15		2015-16		2016-17		2017-18	
Elementary	3205	3668	H463	3226	H21	3319	H114	3235	H30	3161	L44
Middle	1779	1933	H154	1837	H58	1830	H51	1811	H32	1785	H6
High	2349	2534	H185	2547	H198	2517	H168	2439	H90	2396	H47

**D. Student Membership Growth Rate .....(Change).....Pg. 38**

Projected Average Annual Growth Rate Over Next 10 Years										
	Chapel Hill/Carrboro School District					Orange County School District				
Year Projection Made:	2014-15	2015-16	2016-17	2017-18	2018-19	2014-15	2015-16	2016-17	2017-18	2018-19
Elementary	1.11%	0.92%	0.91%	0.36%	0.56%	0.55%	0.80%	0.51%	0.58%	0.91%
Middle	1.15%	0.82%	0.95%	0.21%	0.19%	0.09%	0.67%	0.36%	0.13%	0.28%
High	1.22%	0.93%	0.72%	0%	0.16%	0.39%	0.56%	0.22%	-0.10%	0.21%

**E. Student / Housing Generation Rate .....(No Change).....Pg. 41**

**SCHOOL ADEQUATE PUBLIC FACILITIES ORDINANCE STATUS**

(based on future year Student Membership Projections)

**CHAPEL HILL/CARRBORO SCHOOL DISTRICT**

**Elementary School Level**

- A. Does not currently exceed 105% LOS standard (current LOS is 96.6%).
- B. The projected growth rate at this level is expected to decrease over the next 10 years, but remain positive (average ~0.56% per year compared to 0.67% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Elementary School in the 10-year projection period.

**Middle School Level**

- A. Does not currently exceed 107% LOS standard (current LOS is 99.6%).
- B. The projected growth rate at this level is expected to decrease over the next 10 years, but remain positive (average ~0.19% compared to an average of 0.78% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Middle School in the 10-year projection period.

**High School Level**

- A. Does not currently exceed the 110% LOS standard (current LOS is 101.5%).
- B. The projected growth rate at this level is expected to decrease over the next 10 years (average ~0.16% compared to 0.79% over the past 10 years).

- C. Similar to last year, projections are not showing a need to expand Carrboro High School from the initial capacity of 800 students to the ultimate capacity of 1,200 students in the 10-year projection period.

### **ORANGE COUNTY SCHOOL DISTRICT**

#### **Elementary School Level**

- A. Does not currently exceed 105% LOS standard (current LOS is 95.4%).
- B. The projected growth rate at this level is expected to increase and remain positive over the next 10 years (average ~0.91% compared to 0.11% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Elementary School in the 10-year projection period.

#### **Middle School Level**

- A. Does not currently exceed 107% LOS standard (current LOS is 82.1%).
- B. The projected growth rate at this level is expected to decrease, but remain positive over the next 10 years (average ~0.28% compared to 0.57% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Middle School in the 10-year projection period.

#### **High School Level**

- A. Does not currently exceed 110% LOS standard (current LOS is 96.3%).
- B. The projected growth rate at this level is expected to decrease, but remain positive over the next 10 years (average ~ 0.21% compared to 1.08% over the past 10 years).
- C. Similar to last year, projections are not showing a need to expand Cedar Ridge High School from the initial capacity of 1,000 students to 1,500 students in the 10-year projection period.

### **ADDITIONAL INFORMATION**

The Schools Adequate Public Facilities Ordinance (SAPFO) student projections illustrate when the adopted level of service capacities are forecasted to be met and/or exceeded in anticipation of CIP planning and the construction of a new school. Both school districts continue planning efforts to renovate and expand existing facilities to address school capacity needs in a more feasible way. Additional capacity resulting from school renovations and expansions will be added to the projection models in stages, once funding is approved, versus the addition of greater capacity when a new school is constructed and completed. The renovation and expansion to existing facilities may delay construction of new schools further into the future. This process will pose some challenges to SAPFO compared to the existing process which indicates in advance when a completely new school is needed. Decisions on the timing of reconstruction (i.e. capacity additions) funding would be directly linked to the SAPFO model at the appropriate time.

SAPFO student projections for this year are not showing a need for new school construction or expansion in the 10-year projection period for both school districts due to slowing student growth rates. However, planned residential development in the near future may increase student membership and accelerate school construction and expansion needs into the 10-year projection period. Although capacity and construction needs are not identified this year, both school districts face a large backlog of school capital maintenance and renovation projects that need to



be addressed. Given that student projections are not showing an immediate need for school construction in the 10-year period, this may provide the time for both school districts to commence and/or complete these projects in order to address ongoing needs.

### Changes in Average Class Size

In 2018, the North Carolina General Assembly unveiled House Bill 90 which allows for a phasing-in process to address the decrease in class size averages over the next three school years. Based on House Bill 90, average class sizes for kindergarten to third grade will face a decrease from 1:20 to 1:19 for the 2019-2020 school year, 1:19 to 1:18 for the 2020-2021 school year, and 1:18 to 1:17 for the 2021-2022 school year. Reductions in class size averages may create elementary school capacity issues for the 2021-2022 school year. In order to address these impacts in time, the Schools Joint Action Committee (SJAC) continues to meet order to review impacts to both school districts, discuss options, and determine how to implement the school capacity changes into the SAPFO annual report and 10-year student membership and building capacity projections sheets.

### Charter and Private Schools

Currently, there are two Charter Schools located in the Town of Hillsborough. Charter student membership for these two schools is as follows:

	Eno River Academy	The Expedition School
School Year	Number of Students	Number of Students
2017-18	542	326
2018-19	655 (+113)	355 (+29)

Charter and private schools are not included as part of the SAPFO Annual Report and, as a result, their membership and capacity numbers are not monitored or included in future projections. SAPFO projections are used for projecting only public school construction needs. However, the SAPFO Technical Advisory Committee does monitor charter and private schools and their effect on student enrollment in both school districts. If a charter or private school were to close and a spike were to be realized in school enrollment, the student projections would likely accelerate the need for additional capacity in future years, but likely still within an appropriate time for CIP planning. Charter Schools are also monitored by the Department of Public Institution (DPI) which provides pupil information, based on data received from Charter Schools located in Orange County, to the County for funding purposes. The County budgeted for charter schools as follows:

	Chapel Hill-Carrboro City Schools	Orange County Schools
Fiscal Year	Number of Students	Number of Students
2017-18	162	617
2018-19	155 (-7)	769 (+152)

Although charter and private schools numbers are not collected for SAPFO purposes, impacts due to enrollment at these schools are accounted for in SAPFO process with the annual reporting of student membership and growth rates contained in the 10-year student projections.



### Future Residential Development

Following the economic downturn, there has been an increase in approved and undeveloped residential projects in Orange County. Currently, there are over four thousand proposed single family and multifamily housing units approved, but undeveloped in the CHCCS district. In addition, there are over a thousand proposed residential units approved, but undeveloped in the OCS district. Proposed growth is not included in the SAPFO projection system until actual students begin enrollment. The Certificate of Adequate Public Schools (CAPS) test is conducted during the approval process at a certain stage. Once students are enrolled in a school year, through annual reporting of student membership numbers, 10-year student projections can be updated to display future capacity needs in time to efficiently plan for future school construction requests. Staff and the SAPFO Technical Advisory Committee continue to monitor and evaluate the demand and growth of residential development throughout Orange County as well as its effect on student membership rates.

Below is a list of larger residential projects and the potential number of students from these projects which may have impact to the schools in the short term. Please note, a CAPS has not been issued for The Meadows or Villas at Havenstone due to their location in the City of Mebane. The City of Mebane is not a party to the SAPFO agreement and therefore does not require that CAPS (Certificate of Adequate Public Schools) be issued prior to development approvals. As a result, the potential number of students is based on unit type and bedroom count estimates.

Residential Project	Jurisdiction	Proposed Total Units	Potential Number of Students
<b>Collins Ridge Phase 1</b>	Hillsborough	672	Elementary: 84 Middle: 45 High: 57
<b>Carraway Village</b>	Chapel Hill	400	Elementary: 28 Middle: 10 High: 14
<b>The Meadows</b>	Mebane	279	Elementary: 67 Middle: 35 High: 37
<b>Villas at Havenstone</b>	Mebane	68	Elementary: 4 Middle: 3 High: 4



**ORANGE COUNTY, NC**  
**SCHOOLS ADEQUATE PUBLIC**  
**FACILITIES ORDINANCE**

**PREPARED BY A STAFF COMMITTEE: PLANNING DIRECTORS,  
SCHOOL REPRESENTATIVES, TECHNICAL ADVISORY COMMITTEE  
(SAPFOTAC)**

**(PURSUANT TO PROVISIONS OF A MEMORANDUM OF  
UNDERSTANDING ADOPTED IN 2002 & 2003)  
(ORDINANCES ADOPTED IN JULY 2003)**

**Annual Report**  
**2019**

**(BASED ON NOVEMBER 2018 DATA)**

**CERTIFIED BY THE BOCC ON MAY X, 2019**

# Table of Contents

<b>2019 SAPFOTAC Executive Summary .....</b>	<b>i</b>
<b>Introduction.....</b>	<b>vi</b>
<b>Schools Adequate Public Facilities Ordinance Partners.....</b>	<b>vii</b>
<b>Planning Directors/School Representatives Technical Advisory Committee.....</b>	<b>viii</b>
<b>I. Base Memorandum of Understanding .....</b>	<b>1</b>
<b>A. Level of Service .....</b>	<b>1</b>
<b>B. Building Capacity and Membership .....</b>	<b>2</b>
Attachment I.B.1 Orange County School Capacity (Elementary, Middle, & High) (2017-18).....	5
Attachment I.B.2 Chapel Hill/Carrboro School Capacity (Elementary, Middle, & High) (2017-18).....	8
Attachment I.B.3 Orange County School Capacity (Elementary, Middle, & High) (2018-19).....	11
Attachment I.B.4 Chapel Hill/Carrboro School Capacity (Elementary, Middle, & High) (2018-19).....	14
<b>C. Membership Date.....</b>	<b>17</b>
<b>II. Annual Update to Schools Adequate Public Facilities Ordinance System .....</b>	<b>18</b>
<b>A. Capital Investment Plan (CIP) .....</b>	<b>18</b>
<b>B. Student Membership Projection Methodology .....</b>	<b>19</b>
Attachment II.B.I – Student Membership Projection Descriptions.....	20
Attachment II.B.2 – Student Membership Projection Models Performance Analysis (2017-18).....	21
Attachment II.B.3 – Student Membership Projection Models Performance Analysis (2018-19).....	25
<b>C. Student Membership Projections .....</b>	<b>29</b>
Attachment II.C.1 – Orange County Student Projections (Elementary, Middle, & High) (2017-18).....	34
Attachment II.C.2 – Chapel Hill/Carrboro Student Projections (Elementary, Middle, & High) (2017-18) .....	35
Attachment II.C.3 – Orange County Student Projections (Elementary, Middle, & High) (2018-19).....	36
Attachment II.C.4 – Chapel Hill/Carrboro Student Projections (Elementary, Middle, & High) (2018-19) .....	37
<b>D. Student Membership Growth Rate .....</b>	<b>38</b>
Attachment II.D.1 – Orange County and Chapel Hill/Carrboro Student Growth Rates (Chart dates from 2018-2028 based on 11/15/17 membership numbers) (2017-18) .....	39
Attachment II.D.2 – Orange County and Chapel Hill/Carrboro Student Growth Rates (Chart dates from 2019-2029 based on 11/15/18 membership numbers) (2018-19) .....	40
<b>E. Student / Housing Generation Rate .....</b>	<b>41</b>
Attachment II.E.1 – Current Student Generation Rates (2015) .....	43
<b>III. Flowchart of Schools Adequate Public Facilities Ordinance Process .....</b>	<b>44</b>
<b>A. Capital Investment Plan (CIP) (Process 1).....</b>	<b>44</b>
Attachment III.A.1 – Process 1 Capital Improvement Plan .....	45
<b>B. Schools Adequate Public Facilities Ordinance Certificate of Adequate Public Schools (CAPS)         Update (Process 2) .....</b>	<b>46</b>
Attachment III.B.1 – Process 2 Certificate of Adequate Public Schools (CAPS) Allocation.....	47

## 2019 SAPFOTAC Executive Summary

### I. Base Memorandum of Understanding

#### A. Level of Service .....(No Change).....Pg. 1

	<i>Chapel Hill/Carrboro School District</i>	<i>Orange County School District</i>
<i>Elementary</i>	105%	105%
<i>Middle</i>	107%	107%
<i>High</i>	110%	110%

#### B. Building Capacity and Membership .....(Change).....Pg. 2

	<i>Chapel Hill/Carrboro School District</i>			<i>Orange County School District</i>		
	Capacity	Membership	Increase from Prior Year	Capacity	Membership	Increase from Prior Year
<i>Elementary</i>	5664	5471	(51)	3361	3205	22
<i>Middle</i>	2944	2933	100	2166	1779	49
<i>High</i>	3875	3932	5	2439	2349	(96)

#### C. Membership Date – November 15.....(No Change).....Pg.17

### II. Annual Update to SAPFO System

#### A. Capital Investment Plan (CIP) .....(No Change).....Pg. 18

#### B. Student Membership Projection Methodology .....(No Change).....Pg. 19 The average of 3, 5, and 10 year history/cohort survival, linear and arithmetic projection models.

#### C. Student Membership Projections .....(Change).....Pg. 29

#### Analysis of 5 Years of Projections for 2018-19 School Year – Chapel Hill/Carrboro City Schools

(The first column for each year includes the student membership projection made for 2018-19 in that given year. The second column for each year includes the number of students the projection was off compared to actual membership. An “L” indicates the projection was low compared to the actual, whereas an “H” indicates the projection was high compared to the actual.)

		Year Projection Made for 2018-19 Membership									
	Actual 2018 Membership	2013-2014		2014-2015		2015-2016		2016-2017		2017-2018	
<b>Elementary</b>	5471	6021	H550	5795	H324	5622	H151	5655	H184	5509	H38
<b>Middle</b>	2933	3063	H130	3009	H76	2915	L18	2898	L35	2889	L44
<b>High</b>	3932	4011	H79	3920	L12	3842	L90	3846	L86	3915	L17

## Analysis of 5 Years of Projections for 2018-19 School Year – Orange County Schools

(The first column for each year includes the student membership projection made for 2018-2019 in that given year. The second column for each year includes the number of students the projection was off compared to actual membership. An “L” indicates the projection was low compared to the actual, whereas an “H” indicates the projection was high compared to the actual.)

		Year Projection Made for 2018-19 Membership									
	Actual 2018 Membership	2013-14		2014-15		2015-16		2016-17		2017-18	
<b>Elementary</b>	3205	3668	H463	3226	H21	3319	H114	3235	H30	3161	L44
<b>Middle</b>	1779	1933	H154	1837	H58	1830	H51	1811	H32	1785	H6
<b>High</b>	2349	2534	H185	2547	H198	2517	H168	2439	H90	2396	H47

### D. Student Membership Growth Rate .....(Change).....Pg. 38

Projected Average Annual Growth Rate Over Next 10 Years										
	Chapel Hill/Carrboro School District					Orange County School District				
Year Projection Made:	2014-15	2015-16	2016-17	2017-18	2018-19	2014-15	2015-16	2016-17	2017-18	2018-19
<b>Elementary</b>	1.11%	0.92%	0.91%	0.36%	0.56%	0.55%	0.80%	0.51%	0.58%	0.91%
<b>Middle</b>	1.15%	0.82%	0.95%	0.21%	0.19%	0.09%	0.67%	0.36%	0.13%	0.28%
<b>High</b>	1.22%	0.93%	0.72%	0%	0.16%	0.39%	0.56%	0.22%	-0.10%	0.21%

### E. Student / Housing Generation Rate .....(No Change).....Pg. 41

## SCHOOL ADEQUATE PUBLIC FACILITIES ORDINANCE STATUS

(based on future year Student Membership Projections)

### CHAPEL HILL/CARRBORO SCHOOL DISTRICT

#### Elementary School Level

- A. Does not currently exceed 105% LOS standard (current LOS is 96.6%).
- B. The projected growth rate at this level is expected to decrease over the next 10 years, but remain positive (average ~0.56% per year compared to 0.67% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Elementary School in the 10-year projection period.

#### Middle School Level

- A. Does not currently exceed 107% LOS standard (current LOS is 99.6%).
- B. The projected growth rate at this level is expected to decrease over the next 10 years, but remain positive (average ~0.19% compared to an average of 0.78% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Middle School in the 10-year projection period.

#### High School Level

- A. Does not currently exceed the 110% LOS standard (current LOS is 101.5%).
- B. The projected growth rate at this level is expected to decrease over the next 10 years (average ~0.16% compared to 0.79% over the past 10 years).

- C. Similar to last year, projections are not showing a need to expand Carrboro High School from the initial capacity of 800 students to the ultimate capacity of 1,200 students in the 10-year projection period.

## **ORANGE COUNTY SCHOOL DISTRICT**

### **Elementary School Level**

- A. Does not currently exceed 105% LOS standard (current LOS is 95.4%).
- B. The projected growth rate at this level is expected to increase and remain positive over the next 10 years (average ~0.91% compared to 0.11% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Elementary School in the 10-year projection period.

### **Middle School Level**

- A. Does not currently exceed 107% LOS standard (current LOS is 82.1%).
- B. The projected growth rate at this level is expected to decrease, but remain positive over the next 10 years (average ~0.28% compared to 0.57% over the past 10 years).
- C. Similar to last year, projections are not showing a need for an additional Middle School in the 10-year projection period.

### **High School Level**

- A. Does not currently exceed 110% LOS standard (current LOS is 96.3%).
- B. The projected growth rate at this level is expected to decrease, but remain positive over the next 10 years (average ~ 0.21% compared to 1.08% over the past 10 years).
- C. Similar to last year, projections are not showing a need to expand Cedar Ridge High School from the initial capacity of 1,000 students to 1,500 students in the 10-year projection period.

## **ADDITIONAL INFORMATION**

The Schools Adequate Public Facilities Ordinance (SAPFO) student projections illustrate when the adopted level of service capacities are forecasted to be met and/or exceeded in anticipation of CIP planning and the construction of a new school. Both school districts continue planning efforts to renovate and expand existing facilities to address school capacity needs in a more feasible way. Additional capacity resulting from school renovations and expansions will be added to the projection models in stages, once funding is approved, versus the addition of greater capacity when a new school is constructed and completed. The renovation and expansion to existing facilities may delay construction of new schools further into the future. This process will pose some challenges to SAPFO compared to the existing process which indicates in advance when a completely new school is needed. Decisions on the timing of reconstruction (i.e. capacity additions) funding would be directly linked to the SAPFO model at the appropriate time.

SAPFO student projections for this year are not showing a need for new school construction or expansion in the 10-year projection period for both school districts due to slowing student growth rates. However, planned residential development in the near future may increase student membership and accelerate school construction and expansion needs into the 10-year projection period. Although capacity and construction needs are not identified this year, both school districts face a large backlog of school capital maintenance and renovation projects that need to



be addressed. Given that student projections are not showing an immediate need for school construction in the 10-year period, this may provide the time for both school districts to commence and/or complete these projects in order to address ongoing needs.

**Changes in Average Class Size**

In 2018, the North Carolina General Assembly unveiled House Bill 90 which allows for a phasing-in process to address the decrease in class size averages over the next three school years. Based on House Bill 90, average class sizes for kindergarten to third grade will face a decrease from 1:20 to 1:19 for the 2019-2020 school year, 1:19 to 1:18 for the 2020-2021 school year, and 1:18 to 1:17 for the 2021-2022 school year. Reductions in class size averages may create elementary school capacity issues for the 2021-2022 school year. In order to address these impacts in time, the Schools Joint Action Committee (SJAC) continues to meet order to review impacts to both school districts, discuss options, and determine how to implement the school capacity changes into the SAPFO annual report and 10-year student membership and building capacity projections sheets.

**Charter and Private Schools**

Currently, there are two Charter Schools located in the Town of Hillsborough. Charter student membership for these two schools is as follows:

	<b>Eno River Academy</b>	<b>The Expedition School</b>
<b>School Year</b>	<b>Number of Students</b>	<b>Number of Students</b>
<b>2017-18</b>	542	326
<b>2018-19</b>	655 (+113)	355 (+29)

Charter and private schools are not included as part of the SAPFO Annual Report and, as a result, their membership and capacity numbers are not monitored or included in future projections. SAPFO projections are used for projecting only public school construction needs. However, the SAPFO Technical Advisory Committee does monitor charter and private schools and their effect on student enrollment in both school districts. If a charter or private school were to close and a spike were to be realized in school enrollment, the student projections would likely accelerate the need for additional capacity in future years, but likely still within an appropriate time for CIP planning. Charter Schools are also monitored by the Department of Public Institution (DPI) which provides pupil information, based on data received from Charter Schools located in Orange County, to the County for funding purposes. The County budgeted for charter schools as follows:

	<b>Chapel Hill-Carrboro City Schools</b>	<b>Orange County Schools</b>
<b>Fiscal Year</b>	<b>Number of Students</b>	<b>Number of Students</b>
<b>2017-18</b>	162	617
<b>2018-19</b>	155 (-7)	769 (+152)

Although charter and private schools numbers are not collected for SAPFO purposes, impacts due to enrollment at these schools are accounted for in SAPFO process with the annual reporting of student membership and growth rates contained in the 10-year student projections.

### **Future Residential Development**

Following the economic downturn, there has been an increase in approved and undeveloped residential projects in Orange County. Currently, there are over four thousand proposed single family and multifamily housing units approved, but undeveloped in the CHCCS district. In addition, there are over a thousand proposed residential units approved, but undeveloped in the OCS district. Proposed growth is not included in the SAPFO projection system until actual students begin enrollment. The Certificate of Adequate Public Schools (CAPS) test is conducted during the approval process at a certain stage. Once students are enrolled in a school year, through annual reporting of student membership numbers, 10-year student projections can be updated to display future capacity needs in time to efficiently plan for future school construction requests. Staff and the SAPFO Technical Advisory Committee continue to monitor and evaluate the demand and growth of residential development throughout Orange County as well as its effect on student membership rates.

Below is a list of larger residential projects and the potential number of students from these projects which may have impact to the schools in the short term. Please note, a CAPS has not been issued for The Meadows or Villas at Havenstone due to their location in the City of Mebane. The City of Mebane is not a party to the SAPFO agreement and therefore does not require that CAPS (Certificate of Adequate Public Schools) be issued prior to development approvals. As a result, the potential number of students is based on unit type and bedroom count estimates.

<b>Residential Project</b>	<b>Jurisdiction</b>	<b>Proposed Total Units</b>	<b>Potential Number of Students</b>
<b>Collins Ridge Phase 1</b>	Hillsborough	672	Elementary: 84 Middle: 45 High: 57
<b>Carraway Village</b>	Chapel Hill	400	Elementary: 28 Middle: 10 High: 14
<b>The Meadows</b>	Mebane	279	Elementary: 67 Middle: 35 High: 37
<b>Villas at Havenstone</b>	Mebane	68	Elementary: 4 Middle: 3 High: 4

# **Orange County, NC School Adequate Public Facilities Ordinance**

## **Introduction**

The Schools Adequate Public Facilities Ordinance (SAPFO) and its Memorandum of Understanding are ordinances and agreements, respectively. Supporting documents are anticipated to be dynamic to incorporate the annual changing conditions of membership, capacity and student projections that may affect School Capital Investment Plan (CIP) timing. This formal annual report will be forthcoming to all of the Schools Adequate Public Facilities Ordinance partners each year as new information is available.

This updated information is used in the schools capital needs process of the Capital Investment Plan (Process 1) and within elements of the Schools Adequate Public Facilities Ordinance Certificate of Adequate Public Schools (CAPS) spreadsheet system (Process 2).

This report and any comments from the Schools Adequate Public Facilities Ordinance partners will be considered in the first half of each year by the Board of County Commissioners at a regular or special meeting. The various elements of the report are then “certified” and formally considered in the process of the upcoming Capital Investment Plan. The Certificate of Adequate Public Schools system is updated after November 15 when data is received from the school districts with actual membership and pre-certified capacity (i.e. CIP capacity or prior “joint action” capacity changes).

The Schools Adequate Public Facilities Ordinance and Memorandum of Understanding have dynamic aspects. The derivation of the baseline and update to the variables will continue in the future as a variety of school related issues are fine-tuned by technical and policy groups.

The primary facet of this report includes the creation of mathematical projections for student memberships by school levels (Elementary, Middle and High) and by School Districts (Chapel Hill/Carrboro and Orange County). This information is found in Section II, Subsections B, C, D, and E.

In summary, this report serves as an update to the dynamic conditions of student membership and school capacity which affect future projected needs considered in Capital Investment Planning.

Interested parties may make their comments known to the Board of County Commissioners prior to their review of the report and school CIP completion or ask questions of the SAPFOTAC members.



**Schools Adequate Public Facilities Ordinance Partners**

**ANNUAL REPORT AS OUTLINED IN  
Schools Adequate Public Facilities Ordinance Memorandum  
of Understanding (SAPFO MOU)  
SECTION 1d**

**RESPECTFULLY SUBMITTED  
TO SCHOOLS ADEQUATE PUBLIC FACILITIES  
ORDINANCE PARTNERS**

<b>Chapel Hill/Carrboro School District SAPFO</b>	<b>Orange County School District SAPFO</b>
Board of County Commissioners	Board of County Commissioners
Carrboro Board of Aldermen	Hillsborough Board of Commissioners
Chapel Hill Town Council	
Chapel Hill/Carrboro School Board	Orange County School Board

**Planning Directors/School Representatives**  
**Technical Advisory Committee**  
**(aka SAPFOTAC)**

**Town of Carrboro**  
**Trish McGuire, Planning Director**  
**301 West Main Street**  
**Carrboro, NC 27510**

**Town of Chapel Hill**  
**Ben Hitchings, Planning and Development Services Director**  
**405 Martin Luther King, Jr. Blvd.**  
**Chapel Hill, North Carolina 27514**

**Town of Hillsborough**  
**Margaret Hauth, Planning Director**  
**P.O. Box 429**  
**Hillsborough, NC 27278**

**Orange County Planning Department**  
**Craig Benedict, Planning Director**  
**Ashley Moncado, Special Projects Planner**  
**Gary Donaldson, Director of Finance and Administrative Services**  
**131 W. Margaret Lane**  
**P.O. Box 8181**  
**Hillsborough, NC 27278**

**Orange County School District**  
**Todd Wirt, Superintendent**  
**200 E. King Street**  
**Hillsborough, NC 27278**

**Chapel Hill-Carrboro School District**  
**Patrick Abele, Assistant Superintendent for Support Services**  
**Catherine Mau, Coordinator of Student Enrollment**  
**750 Merritt Mill Road**  
**Chapel Hill, NC 2751**

# I. Base Memorandum of Understanding

## A. Level of Service

1. **Responsible Entity for Suggesting Change** – Change can only be effectuated by amendment to Memorandum of Understanding (MOU) by all SAPFO partners.
2. **Definition** – Level of Service (LOS) means the amount (level) of students that can be accommodated (serviced) at a certain school system grade group [i.e., Elementary level (K-5), Middle Level (6-8), High School Level (9-12)].

3. **Standard for:**

**Standard for:**

**Chapel Hill/Carrboro School District**

**Orange County School District**

<b>Elementary</b>	<b>Middle</b>	<b>High School</b>	<b>Elementary</b>	<b>Middle</b>	<b>High School</b>
<b>105%</b>	<b>107%</b>	<b>110%</b>	<b>105%</b>	<b>107%</b>	<b>110%</b>

4. **Analysis of Existing Conditions:**

**Analysis of Existing Conditions:**

**Chapel Hill/Carrboro School District**

**Orange County School District**

These standards are acceptable at this time.

These standards are acceptable at this time.

5. **Recommendation:**

**Recommendation:**

**Chapel Hill/Carrboro School District**

**Orange County School District**

No change from above standard.

No change from above standard.



## B. Building Capacity and Membership

- 1. *Responsible Entity for Suggesting Change*** – The Planning Directors, School Representatives, and Technical Advisory Committee (SAPFOTAC) will receive requested changes that are CIP related and adopted in the prior year. CIP capacity changes will be updated along with actual membership received in November of each year. Other changes will be sent to a ‘Joint Action Committee’ of the BOCC and Board of Education, as noted in the MOU, who will make recommendations and forward changes (on the specific forms with justification) to the full Board of County Commissioners for review and action. These non-CIP changes would be updated in the upcoming November CAPS system recalibration and included in the SAPFOTAC report.
- 2. *Definition*** – “For purposes of this Memorandum, "building capacity" will be determined by reference to State guidelines and the School District guidelines (consistent with CIP School Construction Guidelines/policies developed by the School District and the Board of County Commissioners) and will be determined by a joint action of the School Board and the Orange County Board of Commissioners. As used herein the term "building capacity" refers to permanent buildings. Mobile classrooms and other temporary student accommodating classroom spaces are not permanent buildings and may not be counted in determining the school districts building capacity.”

### **3. *Standard for:***

#### **Chapel Hill/Carrboro School District**

The original certified capacity for each of the schools was certified by the respective superintendent and incorporated in the initialization of the CAPS system (Chapel Hill Carrboro School District April 29, 2002 - Base) Capacity changes were made each year as follows:

**2003:** Increase of 619 at Rashkis Elementary.

**2004:** No changes at Elementary, Middle, or High School levels.

**2005:** No changes at Elementary, Middle, or High

### ***Standard for:***

#### **Orange County School District**

The original certified capacity for each of the schools was certified by the respective superintendent and incorporated in the initialization of the CAPS system (Orange County School District April 30, 2002 - Base) Capacity changes were made each year as follows:

**2003:** No net increase in capacity at Elementary level. No changes at Middle School level. Increase of 1,000 at Cedar Ridge High School.

**2004:** No net increase in capacity at Elementary

*Section I*

School levels.

**2006:** No changes at Elementary, Middle, or High School levels.

**2007:** An increase of 800 at the High School level with the opening of Carrboro High School.

**2008:** An increase of 323 at the Elementary School level due to the opening of Morris Grove Elementary School and the implementation of the 1:21 class size ratio in grades K-3

**2009:** No changes at Elementary, Middle, or High School levels.

**2010:** An increase in capacity of 40 students at the High School level with Phoenix Academy High School becoming official high school within the district

**2011:** No changes at Elementary, Middle, or High School levels.

**2012:** No changes at Elementary, Middle, or High School levels.

**2013:** An increase in capacity of 585 students due to the opening of Northside Elementary School.

**2014:** An increase in capacity of 104 students due to the opening of the Culbreth Middle School addition.

**2015:** No changes at Elementary, Middle, or High School levels.

**2016:** No changes at Elementary, Middle, or High School levels.

**2017:** A decrease in capacity of 165 students due to the implementation of the 1:20 class size ratio in grades K-3.

level. No changes at Middle or High School levels.

**2005:** An increase in capacity of 100 at Hillsborough Elementary with the completion of renovations.

**2006:** An increase in capacity of 700 at the Middle School level with the completion of Gravelly Hill Middle School and an increase of 15 at the High School level with the temporary location of Partnership Academy Alternative School. An increase of 2 at the Elementary level due to a change in the capacity calculation for each grade at each school.

**2007:** No changes at Elementary, Middle, or High School levels.

**2008:** A decrease of 228 at the Elementary School level due to the implementation of the 1:21 class size ratio in grades K-3 and an increase of 25 at the High School level with the completion of the new Partnership Academy Alternative School.

**2009:** No changes at Elementary, Middle, or High School levels.

**2010:** No changes at Elementary, Middle, or High School levels.

**2011:** No changes at Elementary, Middle, or High School levels.

**2012:** No changes at Elementary or Middle School levels. A decrease of 119 at High School level as a result of a N.C. Department of Public Instruction (DPI) study.

**2013:** No changes at Elementary, Middle, or High

*Section I*

**2018:** No changes at Elementary, Middle or High School levels.

School levels.

**2014:** No changes at Elementary, Middle, or High School levels.

**2015:** No changes at Elementary, Middle, or High School levels.

**2016:** No changes at Elementary, Middle, or High School levels.

**2017:** A decrease in capacity of 333 students due to the implementation of the 1:20 class size ratio in grades K-3.

**2018:** No changes at Elementary, Middle, or High School Level.

**4. *Analysis of Existing Conditions:***

**Chapel Hill/Carrboro School District**

The Schools Facilities Task Force developed a system to calculate capacity. Any changes year to year will be monitored, reviewed, and recorded by the SAPFOTAC on approved forms distributed to SAPFO partners and certified upon approval by the Board of County Commissioners each year. The requested 2018-19 capacity is noted on Attachment I.B.4

**5. *Recommendation:***

**Chapel Hill/Carrboro School District**

Accept school capacities at all levels, as reported by CHCCS and shown in Attachment I.B.4.

***Analysis of Existing Conditions:***

**Orange County School District**

The Schools Facilities Task Force developed a system to calculate capacity. Any changes year to year will be monitored, reviewed, and recorded by the SAPFOTAC on approved forms distributed to SAPFO partners and certified upon approval by the Board of County Commissioners each year. The requested 2018-19 capacity is noted on Attachment I.B.3

***Recommendation:***

**Orange County School District**

Accept school capacities at all levels, as reported by OCS and shown in Attachment I.B.3.



**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Orange County Schools
<b>SAPFO CAPS Year:</b> November 15, 2017 - November 14, 2018
<b>Capacity and Membership Submittal Date:</b> November 15, 2017

Elementary School	Square Feet	2013-2014 Requested Capacity	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	Justification Footnote #	Membership
Cameron Park	70,812	565	565	565	565	502		617
Central	52,492	455	455	455	455	428		268
Efland Cheeks	64,316	497	497	497	497	455		411
Grady Brown	74,016	544	544	544	544	490		463
Hillsborough	51,106	471	471	471	471	420		451
New Hope	100,164	586	586	586	586	526		594
Pathways	85,282	576	576	576	576	540		379
<b>Total</b>	<b>498,188</b>	<b>3,694</b>	<b>3,694</b>	<b>3,694</b>	<b>3,694</b>	<b>3,361</b>		<b>3,183</b>

**Special Note(s):** 1. For the November 15, 2002 base year the board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

**Justification:**

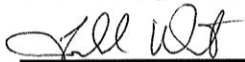
Reduction in class sizes in grades K-3 due to Legislative requirements under House Bill 13.

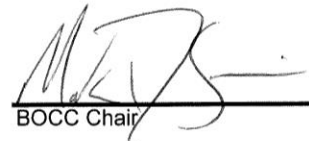
**Capacity Certification:**

 11/30/17  
 Superintendent Date

  
 BOCC Chair Date

**Membership Certification:**

 11/30/17  
 Superintendent Date

  
 BOCC Chair Date

**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Orange County Schools
<b>SAPFO CAPS Year:</b> November 15, 2017 - November 14, 2018
<b>Capacity and Membership Submittal Date:</b> November 15, 2017

Middle School	Square Feet	2013-2014 Requested Capacity	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	Justification Footnote #	Membership
A.L. Stanback	136,000	740	740	740	740	740		638
C.W. Stanford	107,620	726	726	726	726	726		630
Gravelly Hill	123,000	700	700	700	700	700		462
<b>Total</b>	<b>366,620</b>	<b>2,166</b>	<b>2,166</b>	<b>2,166</b>	<b>2,166</b>	<b>2,166</b>		<b>1,730</b>

**Special Note(s):** 1. For the November 15, 2002 base year the board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

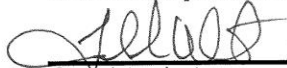
**Justification:**


**Capacity Certification:**

  
 Superintendent 11/21/17  
 Date

  
 BOCC Chair Date

**Membership Certification:**

  
 Superintendent 11/21/17  
 Date

  
 BOCC Chair Date

**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Orange County Schools
<b>SAPFO CAPS Year:</b> November 15, 2017 - November 14, 2018
<b>Capacity and Membership Submittal Date:</b> November 15, 2017

High School	Square Feet	2013-2014 Requested Capacity	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	Justification Footnote #	Membership
Orange	213,509	1,399	1,399	1,399	1,399	1,399		1,286
Cedar Ridge	206,900	1,000	1,000	1,000	1,000	1,000		1,116
Partnership	6,600	40	40	40	40	40		43
<b>Total</b>	<b>427,009</b>	<b>2,439</b>	<b>2,439</b>	<b>2,439</b>	<b>2,439</b>	<b>2,439</b>		<b>2,445</b>

**Special Note(s):** 1. For the November 15, 2002 base year the board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC. 2. The 2012-2013 capacity numbers for Orange High School (1,399) is based on a capacity analysis and facilities study completed by the Department of Public Instruction in August 2012.

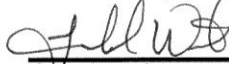
**Justification:**


**Capacity Certification:**

  
 Superintendent 11/20/17  
 Date

  
 BOCC Chair \_\_\_\_\_  
 Date

**Membership Certification:**

  
 Superintendent 11/20/17  
 Date

  
 BOCC Chair \_\_\_\_\_  
 Date



**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Chapel Hill-Carrboro City Schools
<b>SAPFO CAPS Year:</b> November 15, 2017 - November 14, 2018
<b>Capacity and Membership Submittal Date:</b> November 15, 2017

Elementary School	Square Feet	2013-2014 Requested Capacity	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	Justification Footnote #	Membership (referenced school year)
Carrboro	60,832	533	533	533	533	518	1	490
Ephesus	66,952	448	448	448	448	436		396
Estes Hills	56,299	527	527	527	527	516		490
Glenwood	50,764	423	538	423	423	412		507
FP Graham	66,689	538	423	538	538	522		597
McDougle	98,000	564	564	564	564	548		531
Rashkis	95,729	585	585	585	585	568		473
Scroggs	90,980	575	585	575	575	558		501
Seawell	52,896	466	585	466	466	450		541
Morris Grove	90,221	585	575	585	585	568		542
Northside	99,500	585	466	585	585	568		454
<b>Total</b>	<b>828,862</b>	<b>5,829</b>	<b>5,829</b>	<b>5,829</b>	<b>5,829</b>	<b>5,664</b>		<b>5,522</b>

**Special Note(s):** 1. For the November 15, 2002 base year the Board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

**Justification:**

1 New class sizes mandated by HB 13 result in a loss of 165 elementary seats.

**Capacity Certification:**

Pamela Bled 11/27/17  
 Superintendent Date

[Signature]  
 BOCC Chair Date

**Membership Certification:**

Pamela Bled 11/27/17  
 Superintendent Date

[Signature]  
 BOCC Chair Date

**School APFO Capacity, Membership and Change Request Form**

**School District:** Chapel Hill-Carrboro City Schools  
**SAPFO CAPS Year:** November 15, 2017 - November 14, 2018  
**Capacity and Membership Submittal Date:** November 15, 2017

Middle School	Square Feet	2013-2014 Requested Capacity	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	Justification Footnote #	Membership (referenced school year)
Culbreth	122,467	670	774	774	774	774		689
McDougle	136,221	732	732	732	732	732		654
Phillips	109,498	706	706	706	706	706		670
Smith	128,764	732	732	732	732	732		820
<b>Total</b>	<b>496,950</b>	<b>2,840</b>	<b>2,944</b>	<b>2,944</b>	<b>2,944</b>	<b>2,944</b>		<b>2,833</b>

**Special Note(s):** 1. For the November 15, 2002 base year the Board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

**Justification:**

**Capacity Certification:**

Pamela Bala 11/27/17  
 Superintendent Date

[Signature]  
 BOCC Chair Date

**Membership Certification:**

Pamela Bala 11/27/17  
 Superintendent Date

[Signature]  
 BOCC Chair Date

**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Chapel Hill-Carrboro City Schools
<b>SAPFO CAPS Year:</b> November 15, 2017 - November 14, 2018
<b>Capacity and Membership Submittal Date:</b> November 15, 2017

High School	Square Feet	2013-2014 Requested Capacity	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	Justification Footnote #	Membership (referenced school year)
Chapel Hill	241,111	1,520	1,520	1,520	1,520	1,520		1,563
East Chapel Hill	259,869	1,515	1,515	1,515	1,515	1,515		1,464
Carrboro	148,023	800	800	800	800	800		861
Phoenix Acad.	5,207	40	40	40	40	40		39
<b>Total</b>	<b>654,210</b>	<b>3,875</b>	<b>3,875</b>	<b>3,875</b>	<b>3,875</b>	<b>3,875</b>		<b>3,927</b>

**Special Note(s):** 1. For the November 15, 2002 base year the Board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

**Justification:**

**Capacity Certification:**

Pamela Balar 11/27/17  
 Superintendent Date

[Signature]  
 BOCC Chair Date

**Membership Certification:**

Pamela Balar 11/27/17  
 Superintendent Date

[Signature]  
 BOCC Chair Date



**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Orange County Schools
<b>SAPFO CAPS Year:</b> November 15, 2018 - November 14, 2019
<b>Capacity and Membership Submittal Date:</b> November 15, 2018

Elementary School	Square Feet	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	2018-2019 Requested Capacity	Justification Footnote #	Membership
Cameron Park	70,812	565	565	565	502	502		597
Central	52,492	455	455	455	428	428		267
Efland Cheeks	64,316	497	497	497	455	455		467
Grady Brown	74,016	544	544	544	490	490		462
Hillsborough	51,106	471	471	471	420	420		435
New Hope	100,164	586	586	586	526	526		589
Pathways	85,282	576	576	576	540	540		388
<b>Total</b>	<b>498,188</b>	<b>3,694</b>	<b>3,694</b>	<b>3,694</b>	<b>3,361</b>	<b>3,361</b>		<b>3,205</b>

**Special Note(s):** 1. For the November 15, 2002 base year the board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

**Justification:**

**Capacity Certification:**

  
 Superintendent 11-16-18  
 Date

**Membership Certification:**

  
 Superintendent 11-16-18  
 Date

  
 BOCC Chair 12/08/18  
 Date

  
 BOCC Chair 12/08/18  
 Date

**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Orange County Schools
<b>SAPFO CAPS Year:</b> November 15, 2018 - November 14, 2019
<b>Capacity and Membership Submittal Date:</b> November 15, 2018

Middle School	Square Feet	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	2018-2019 Requested Capacity	Justification Footnote #	Membership
A.L. Stanback	136,000	740	740	740	740	740		649
C.W. Stanford	107,620	726	726	726	726	726		649
Gravelly Hill	123,000	700	700	700	700	700		481
<b>Total</b>	<b>366,620</b>	<b>2,166</b>	<b>2,166</b>	<b>2,166</b>	<b>2,166</b>	<b>2,166</b>		<b>1,779</b>

**Special Note(s):** 1. For the November 15, 2002 base year the board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

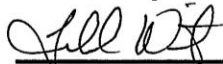
**Justification:**


**Capacity Certification:**

 11-16-18  
 Superintendent Date

 12/08/18  
 BOCC Chair Date

**Membership Certification:**

 11-16-18  
 Superintendent Date

 12/08/18  
 BOCC Chair Date

**School APFO Capacity, Membership and Change Request Form**

**School District:** Orange County Schools

**SAPFO CAPS Year:** November 15, 2018 - November 14, 2019

**Capacity and Membership Submittal Date:** November 15, 2018

High School	Square Feet	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	2018-2019 Requested Capacity	Justification Footnote #	Membership
Orange	213,509	1,399	1,399	1,399	1,399	1,399		1,290
Cedar Ridge	206,900	1,000	1,000	1,000	1,000	1,000		1,018
Partnership	6,600	40	40	40	40	40		41
<b>Total</b>	<b>427,009</b>	<b>2,439</b>	<b>2,439</b>	<b>2,439</b>	<b>2,439</b>	<b>2,439</b>		<b>2,349</b>

**Special Note(s):** 1. For the November 15, 2002 base year the board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC. 2. The 2012-2013 capacity numbers for Orange High School (1,399) is based on a capacity analysis and facilities study completed by the Department of Public Instruction in August 2012.

**Justification:**

**Capacity Certification:**

 11/16/18  
 Superintendent Date

 \_\_\_\_\_  
 BOCC Chair Date

**Membership Certification:**

 11/16/18  
 Superintendent Date

 \_\_\_\_\_  
 BOCC Chair Date



**School APFO Capacity, Membership and Change Request Form**

**School District:** Chapel Hill-Carrboro City Schools  
**SAPFO CAPS Year:** November 15, 2018 - November 14, 2019  
**Capacity and Membership Submittal Date:** November 15, 2018

Elementary School	Square Feet	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	2018-2019 Requested Capacity	Justification Footnote #	Membership (referenced school year)
Carrboro	60,832	533	533	533	518	518		487
Ephesus	66,952	448	448	448	436	436		440
Estes Hills	56,299	527	527	527	516	516		473
Glenwood	50,764	423	538	423	412	412		484
FP Graham	66,689	538	423	538	522	522		615
McDougle	98,000	564	564	564	548	548		540
Rashkis	95,729	585	585	585	568	568		454
Scroggs	90,980	575	585	575	558	558		470
Seawell	52,896	466	585	466	450	450		503
Morris Grove	90,221	585	575	585	568	568		555
Northside	99,500	585	466	585	568	568		450
<b>Total</b>	<b>828,862</b>	<b>5,829</b>	<b>5,829</b>	<b>5,829</b>	<b>5,664</b>	<b>5,664</b>		<b>5,471</b>

**Special Note(s):** 1. For the November 15, 2002 base year the Board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

**Justification:**

**Capacity Certification:**

Pamela Bald 11/20/18  
 Superintendent Date

Penny Ritt 12/18/18  
 BOCC Chair Date

**Membership Certification:**

Pamela Bald 11/20/18  
 Superintendent Date

Penny Ritt 12/18/18  
 BOCC Chair Date



**School APFO Capacity, Membership and Change Request Form**

<b>School District:</b> Chapel Hill-Carrboro City Schools
<b>SAPFO CAPS Year:</b> November 15, 2018 - November 14, 2019
<b>Capacity and Membership Submittal Date:</b> November 15, 2018

High School	Square Feet	2014-2015 Requested Capacity	2015-2016 Requested Capacity	2016-2017 Requested Capacity	2017-2018 Requested Capacity	2018-2019 Requested Capacity	Justification Footnote #	Membership (referenced school year)
Chapel Hill	241,111	1,520	1,520	1,520	1,520	1,520		1,527
East Chapel Hill	259,869	1,515	1,515	1,515	1,515	1,515		1,493
Carrboro	148,023	800	800	800	800	800		877
Phoenix Acad.	5,207	40	40	40	40	40		35
<b>Total</b>	<b>654,210</b>	<b>3,875</b>	<b>3,875</b>	<b>3,875</b>	<b>3,875</b>	<b>3,875</b>		<b>3,932</b>

**Special Note(s):** 1. For the November 15, 2002 base year the Board accepted the superintendent-certified capacities as part of the School Facilities Task Force review and 2003 Planners and School Representative Technical Advisory Committee Report. These capacities will remain effective until changed by (1) the School CIP or (2) an amended version of this form that is certified by the BOCC.

**Justification:**

**Capacity Certification:**

*Parvula Bala*      11/26/18  
 Superintendent                      Date

**Membership Certification:**

*Parvula Bala*      11/26/18  
 Superintendent                      Date

*Penny Kirk*      12/18/18  
 BOCC Chair                      Date

*Penny Kirk*      12/18/18  
 BOCC Chair                      Date



## C. Membership Date

1. ***Responsible Entity for Suggesting Change*** – Change can be effectuated only by amendment to Memorandum of Understanding (MOU) by all SAPFO partners. The Planning Directors, School Representatives, and Technical Advisory Committee (SAPFOTAC) may advise if a change in date would improve the reporting or timeliness of the report.
2. ***Definition*** – The date at which student membership is calculated. This date is updated each year and also serves as the basis for projections along with the history from previous years. “For purposes of this Memorandum, the term "school membership" means the actual number of students attending school as of November 15 of each year. The figure is determined by considering the number of students enrolled (i.e. registered, regardless of whether a student is no longer attending school) and making adjustments for withdrawals, dropouts, deaths, retentions and promotions. Students who are merely absent from class on the date membership is determined as a result of sickness or some other temporary reason are included in school membership figures. Each year the School District shall transmit its school membership to the parties to this agreement no later than five (5) school days after November 15.
3. ***Standard for:***

<b>Chapel Hill/Carrboro School District</b> November 15 of each year	<b>Orange County School District</b> November 15 of each year
---	--
4. ***Analysis of Existing Conditions:***

This will be analyzed in the future years to determine if it is an exemplary date.
5. ***Recommendation:***

<b>Chapel Hill/Carrboro School District</b> No change at this time.	<b>Orange County School District</b> No change at this time.
--	---

## II. Annual Update to Schools Adequate Public Facilities Ordinance System

### A. Capital Investment Plan (CIP)

1. **Responsible Entity for Suggesting Change** – The updating of this section will be conducted by the Board of County Commissioners (BOCC) after review of the CIP requests from the School Districts. Action regarding CIP programs usually occurs during the BOCC budget Public Hearing process in the winter and spring of each year. The development of the CIP considers the conditions noted in the SAPFOTAC report released in the same CIP development year including LOS (level of service), capacity, and membership projections.
2. **Definition** – The process and resultant program to determine school needs and provide funding for new school facilities through a variety of funding mechanisms.
3. **Standard for:**

<b>Chapel Hill/Carrboro School District</b>	<b>Orange County School District</b>
Not Applicable	Not Applicable
4. **Analysis of Existing Conditions:**

The MOU outlines a system of implementing the SAPFO, including issuing Certificates of Adequate Public Schools (CAPS) to new development if capacity is available. The Requests for CAPS will be evaluated using the most recently adopted Capital Investment Plan. A new Capital Investment Plan is currently under development for approval prior to June 30, 2019.
5. **Recommendation:**

Not subject to staff review

## B. Student Membership Projection Methodology

1. **Responsible Entity for Suggesting Change** – This section is reviewed and recommended by the Planning Directors, School Representatives, and Technical Advisory Committee (SAPFOTAC) to the BOCC for change, if necessary.
2. **Definition** – The method(s) by which student memberships are calculated for future years to determine total membership at each combined school level (Elementary, Middle, and High School) which take into consideration historical membership totals at a specific time (November 15) in the school year. These methods are also known as ‘models’.
3. **Standard for:**

<b>Chapel Hill/Carrboro School District</b>	<b>Standard for:</b> <b>Orange County School District</b>
Presently, the <u>average of five models</u> is being used: namely 3, 5, and 10 year history/cohort survival methods, Orange County Planning Department Linear Wave, and Tischler Linear methods. Attachment II.B.1 includes a description of each model.	
4. **Analysis of Existing Conditions:**

Performance of the models is monitored each year. The value of a projection model is in its prediction of school level capacities at least three years in advance of capacity shortfalls so the annual Capital Investment Plan (CIP) updates can respond proactively with siting, design, and construction. Attachment II.B.1 includes a description of each model. Attachment II.B.3 shows the performance of the models for the 2018-19 school year from the prior year projection.
5. **Recommendation:**

More than fifteen years of projection results are now available. Analysis on the accuracy of the results is showing that some models have better results in one district while others have better results in the other district. The historic growth rate is recorded by the models, but projected future growth is more difficult to accurately quantify. In all areas of the county, proposed growth is not included in the SAPFO projection system until actual students begin enrollment. The system is updated in November of each year, becoming part of the historical projection base.



**Attachment II.B.I – Student Membership Projection Descriptions**

**STUDENT MEMBERSHIP PROJECTIONS**

PROJECTION TYPE	DESCRIPTION / CHARACTERISTICS	FORMULA	ASSUMPTIONS
Tischler Linear (OCS & CHCCS)	Mathematical formula; straight line projection	$y = ((c*b)^x) + b$ y=projected population; c=historical annual change; b=base year; x= projection years	Historical growth is reflected in projected growth
OCP Linear Wave (OCS)	Mathematical linear with percent variation among school levels; reflects progressing waves of membership	$BYM + (BYI + 5(n)) = EYM$ $EYM * \%SL = EYM/SL$ BYM= base year 2nd month membership; BYI=year student membership increment base; EYM=ensuing year membership; n=projection year; %SL=% of total membership per school level (i.e. elementary, middle, high); EYM/SL=ensuing year member by school level	Base year growth reflects 10-year average; increase in BYI of 5 every other year reflects increases in housing growth; reflects buildout constraints
OCP Linear Wave (CHCCS)	Mathematical linear with percent variation among school levels; reflects progressing waves of membership	$BYM + (BYI - 15(n)) = EYM$ $EYM * \%SL = EYM/SL$ BYM= base year 2nd month membership; BYI=year student membership increment base; EYM=ensuing year membership; n=projection year; %SL=% of total membership per school level (i.e. elementary, middle, high); EYM/SL=ensuing year member by school level	Base year growth reflects 10-year average; decrease in BYI of 15 until school year 2010-2011 reflects decreases in housing growth; reflects buildout constraints
3-Year Cohort (OCS & CHCCS)	Mathematical formula that computes the average advancement rate over the previous 3 years for each grade level and then uses each rate to calculate projected membership by school level; an assumed kindergarten membership is based on birth records and/or historical growth rates	$K_n = k_{n-1} + (k_{n-1} * 0.01)$ n=1 $a = (\sum G_n / g_{n-1}) / 3$ n=3 $b = g_{n-1} (a)$ K=kindergarten membership; n=given school year; G=given grade's membership(other than kindergarten); g= previous grade's membership; a=average advancement rate; b=projected membership	Assumes a 1% annual growth rate for the kindergarten grade level; assumes the same percentage of students in each grade level graduate to the next level each year
5 year Cohort (OCS & CHCCS)	Mathematical formula that computes the average advancement rate over the previous 5 years for each grade level and then uses each rate to calculate projected membership by school level; an assumed kindergarten membership is based on birth records and/or historical growth rates	$K_n = k_{n-1} + (k_{n-1} * 0.01)$ n=1 $a = (\sum G_n / g_{n-1}) / 5$ n=5 $b = g_{n-1} (a)$ K=kindergarten membership; n=given school year; G=given grade's membership(other than kindergarten); g= previous grade's membership; a=average advancement rate; b=projected membership	Assumes a 1% annual growth rate for the kindergarten grade level; assumes the same percentage of students in each grade level graduate to the next level each year
10 year Cohort (OCS & CHCCS)	Mathematical formula that computes the average advancement rate over the previous 10 years for each grade level and then uses each rate to calculate projected membership by school level; an assumed kindergarten membership is based on birth records and/or historical growth rates	$K_n = k_{n-1} + (k_{n-1} * 0.01)$ n=1 $a = (\sum G_n / g_{n-1}) / 10$ n=10 $b = g_{n-1} (a)$ K=kindergarten membership; n=given school year; G=given grade's membership(other than kindergarten); g= previous grade's membership; a=average advancement rate; b=projected membership	Assumes a 1% annual growth rate for the kindergarten grade level; assumes the same percentage of students in each grade level graduate to the next level each year

**Orange County School District  
 School Membership 2017-2018 School Year (November 15, 2017)**

	11/14/16 Actual 2016-17	2017 Report Projection for 2017-18	11/15/17 Actual 2017-18	Change between actual Nov 2016 - Nov 2017
<b>Elementary</b>	<b>3293</b>		<b>3183</b>	<b>-110</b>
<u>Model</u>			<u>Projection is</u>	
T		3335	H152	
OCP		3329	H146	
10C		3213	H30	
5C		3203	H20	
3C		3188	H5	
<b>AVG</b>		<b>3253</b>	<b>H70</b>	
<b> </b>				
	11/14/16		11/15/17	
<b>Middle</b>	<b>1724</b>		<b>1730</b>	<b>+6</b>
<u>Model</u>			<u>Projection is</u>	
T		1746	H16	
OCP		1744	H14	
10C		1763	H33	
5C		1753	H23	
3C		1750	H20	
<b>AVG</b>		<b>1751</b>	<b>H21</b>	
<b> </b>				
	11/14/16		11/15/17	
<b>High</b>	<b>2446</b>		<b>2445</b>	<b>-1</b>
<u>Model</u>			<u>Projection is</u>	
T		2477	H32	
OCP		2476	H31	
10C		2472	H27	
5C		2493	H48	
3C		2482	H37	
<b>AVG</b>		<b>2480</b>	<b>H35</b>	
<b> </b>				
<b>Totals</b>	11/14/16		11/15/17	
Elementary	3293		3183	
Middle	1724		1730	
High	2446		2445	
	<b>7463</b>		<b>7358</b>	<b>-105</b>
<u>Model</u>			<u>Projection is</u>	
T		7558	H200	
OCP		7549	H191	
10C		7448	H90	
5C		7449	H91	
3C		7420	H62	
<b>AVG</b>		<b>7484</b>	<b>H126</b>	

H means High  
 L means Low

**Orange County School District  
School Membership 2017-2018 School Year (November 15, 2017)**

**Statistical Findings**

<i>PROJECTION TYPE ABBREVIATIONS</i>	
'TISCHLER' LINEAR (T)	10-YEAR COHORT (10C)
ORANGE COUNTY PLANNING (OCP)	5-YEAR COHORT (5C)
	3-YEAR COHORT (3C)

**Elementary School Level**

- The projections were all high, ranging from 5 students to 152 students above actual membership. On average, the projections were 70 students higher than the actual membership.
- The membership actually decreased by 110 students between November 15, 2016 and November 15, 2017.

**Middle School Level**

- The projections were all high, ranging from 14 students to 33 students above actual membership. On average, the projections were 21 students higher than the actual membership.
- The membership actually increased by 6 students between November 15, 2016 and November 15, 2017.

**High School Level**

- Projections were all high, ranging from 27 to 48 students above actual membership. On average, the projections were 35 students higher than the actual membership.
- The membership actually decreased by 1 student between November 15, 2016 and November 15, 2017.

**TOTAL**

- The totals of all school level projections were all high, ranging from 62 to 200 students above actual membership. On average, the projections were 126 students higher than the actual membership.
- The membership decreased in total by 105 students, which is the sum of -110 at Elementary, +6 at Middle, and -1 at High.



**Chapel Hill/Carrboro School District  
School Membership 2017-2018 School Year (November 15, 2017)**

	11/14/16 Actual 2016-17	2017 Report Projection for 2017-18	11/15/17 Actual 2017-18	Change between actual Nov 2016 - Nov 2017
<b>Elementary</b>	<b>5567</b>		<b>5522</b>	<b>-45</b>
<u>Model</u>			<u>Projection is</u>	
T		5641	H119	
OCP		5632	H110	
10C		5599	H77	
5C		5580	H58	
3C		5575	H53	
<b>AVG</b>		<b>5605</b>	<b>H83</b>	
	<u>11/14/16</u>		<u>11/15/17</u>	
<b>Middle</b>	<b>2829</b>		<b>2833</b>	<b>+4</b>
<u>Model</u>			<u>Projection is</u>	
T		2867	H34	
OCP		2893	H60	
10C		2844	H11	
5C		2822	L11	
3C		2807	L26	
<b>AVG</b>		<b>2847</b>	<b>H14</b>	
	<u>11/14/16</u>		<u>11/15/17</u>	
<b>High</b>	<b>3762</b>		<b>3927</b>	<b>+165</b>
<u>Model</u>			<u>Projection is</u>	
T		3812	L115	
OCP		3812	L115	
10C		3850	L77	
5C		3848	L79	
3C		3839	L88	
<b>AVG</b>		<b>3832</b>	<b>L95</b>	
<b>Totals</b>	<u>11/14/16</u>		<u>11/15/17</u>	
Elementary	5567		5522	
Middle	2829		2833	
High	<u>3762</u>		<u>3927</u>	
	<b>12,158</b>		<b>12,282</b>	<b>+124</b>
<u>Model</u>			<u>Projection is</u>	
T		12,320	H38	
OCP		12,337	H55	
10C		12,293	H11	
5C		12,250	L32	
3C		12,221	L61	
<b>AVG</b>		<b>12,284</b>	<b>H2</b>	

H means High  
L means Low

**Chapel Hill/Carrboro School District  
School Membership 2017-2018 School Year (November 15, 2017)**

**Statistical Findings**

<i>PROJECTION TYPE ABBREVIATIONS</i>	
'TISCHLER' LINEAR (T)	10-YEAR COHORT (10C)
ORANGE COUNTY PLANNING (OCP)	5-YEAR COHORT (5C)
	3-YEAR COHORT (3C)

**Elementary School Level**

- Projections were all high ranging from 53 students to 119 students above actual membership. On average, the projections were 83 students higher than the actual membership.
- The actual membership decreased by 45 students between November 15, 2016 and November 15, 2017.

**Middle School Level**

- Projections were mixed, ranging from 26 students below to 60 students above actual membership. On average, the projections were 14 students higher than the actual membership.
- The actual membership increased by 4 students between November 15, 2016 and November 15, 2017.

**High School Level**

- Projections were all low, ranging from 77 to 115 students below actual membership. On average, the projections were 95 students lower than the actual membership.
- The actual membership increased by 165 students between November 15, 2016 and November 15, 2017.

**TOTAL**

- The total of all school level projections were mixed, ranging from 61 students below to 55 students above actual membership. On average, the projections were 2 students higher than the actual membership.
- The membership increased in total by 124 students, which is the sum of -45 at Elementary, +4 at Middle, and +165 at High.

**Orange County School District  
School Membership 2018-2019 School Year (November 15, 2018)**

	11/15/17 Actual 2017-18	2018 Report Projection for 2018-19	11/15/18 Actual 2018-19	Change between actual Nov 2017 - Nov 2018
<b>Elementary</b>	<b>3183</b>		<b>3205</b>	<b>+ 22</b>
<u>Model</u>			<u>Projection is</u>	
T		3201	L4	
OCP		3200	L5	
10C		3140	L65	
5C		3128	L77	
3C		3139	L66	
<b>AVG</b>		<b>3161</b>	<b>L44</b>	
	<u>11/14/17</u>		<u>11/15/18</u>	
<b>Middle</b>	<b>1730</b>		<b>1779</b>	<b>+ 49</b>
<u>Model</u>			<u>Projection is</u>	
T		1740	L39	
OCP		1739	L40	
10C		1822	H43	
5C		1812	H33	
3C		1814	H35	
<b>AVG</b>		<b>1785</b>	<b>H6</b>	
	<u>11/14/17</u>		<u>11/15/18</u>	
<b>High</b>	<b>2445</b>		<b>2349</b>	<b>- 96</b>
<u>Model</u>			<u>Projection is</u>	
T		2458	H109	
OCP		2460	H111	
10C		2354	H5	
5C		2368	H19	
3C		2340	L9	
<b>AVG</b>		<b>2396</b>	<b>H47</b>	
<b>Totals</b>	<u>11/14/17</u>		<u>11/15/18</u>	
Elementary	3183		3205	
Middle	1730		1779	
High	<u>2445</u>		<u>2349</u>	
	<b>7358</b>		<b>7333</b>	<b>- 25</b>
<u>Model</u>			<u>Projection is</u>	
T		7399	H66	
OCP		7399	H66	
10C		7316	L17	
5C		7308	L25	
3C		7293	L40	
<b>AVG</b>		<b>7342</b>	<b>H9</b>	

H means High  
L means Low



**Orange County School District  
 School Membership 2018-2019 School Year (November 15, 2018)**

**Statistical Findings**

<i>PROJECTION TYPE ABBREVIATIONS</i>	
'TISCHLER' LINEAR (T)	10-YEAR COHORT (10C)
ORANGE COUNTY PLANNING (OCP)	5-YEAR COHORT (5C)
	3-YEAR COHORT (3C)

**Elementary School Level**

- The projections were all low, ranging from 4 students to 77 students below actual membership. On average, the projections were 44 students lower than the actual membership.
- The membership actually increased by 22 students between November 16, 2017 and November 15, 2018.

**Middle School Level**

- Projections were mixed, ranging from 40 students below to 43 students above actual membership. On average, the projections were 6 students higher than the actual membership.
- The membership actually increased by 49 students between November 16, 2017 and November 15, 2018.

**High School Level**

- The majority of projections were high, ranging from 5 students to 111 students above actual membership. One projection was 9 students below actual membership. On average, the projections were 47 students higher than the actual membership.
- The membership actually decreased by 96 students between November 16, 2017 and November 15, 2018.

**TOTAL**

- The totals of all school level projections were mixed, ranging from 40 students below to 66 students above actual membership. On average, the projections were 9 students higher than the actual membership.
- The membership decreased in total by 25 students, which is the sum of +22 at Elementary, +49 at Middle, and -96 at High.

**Chapel Hill/Carrboro School District  
School Membership 2018-2019 School Year (November 15, 2018)**

	11/15/17 Actual 2017-18	2018 Report Projection for 2018-19	11/15/18 Actual 2018-19	Change between actual Nov 2017 - Nov 2018
<b>Elementary</b>	<b>5522</b>		<b>5471</b>	<b>- 51</b>
<i>Model</i>			<i>Projection is</i>	
T		5556	H85	
OCP		5541	H70	
10C		5496	H25	
5C		5475	H4	
3C		5479	H8	
<b>AVG</b>		<b>5509</b>	<b>H38</b>	
	<u>11/14/17</u>		<u>11/15/18</u>	
<b>Middle</b>	<b>2833</b>		<b>2933</b>	<b>+ 100</b>
<i>Model</i>			<i>Projection is</i>	
T		2850	L83	
OCP		2848	L85	
10C		2926	L7	
5C		2907	L26	
3C		2915	L18	
<b>AVG</b>		<b>2889</b>	<b>L44</b>	
	<u>11/14/17</u>		<u>11/15/18</u>	
<b>High</b>	<b>3927</b>		<b>3932</b>	<b>+ 5</b>
<i>Model</i>			<i>Projection is</i>	
T		3951	H19	
OCP		3938	H6	
10C		3884	L48	
5C		3889	L43	
3C		3912	L20	
<b>AVG</b>		<b>3915</b>	<b>L17</b>	
<b>Totals</b>	<u>11/14/17</u>		<u>11/15/18</u>	
Elementary	5522		5471	
Middle	2833		2933	
High	<u>3927</u>		<u>3932</u>	
	<b>12,282</b>		<b>12,336</b>	<b>+ 54</b>
<i>Model</i>			<i>Projection is</i>	
T		12,357	H21	
OCP		12,327	L9	
10C		12,306	L30	
5C		12,271	L65	
3C		12,306	L30	
<b>AVG</b>		<b>12,313</b>	<b>L23</b>	

H means High  
L means Low

**Chapel Hill/Carrboro School District  
 School Membership 2018-2019 School Year (November 15, 2018)**

**Statistical Findings**

<i>PROJECTION TYPE ABBREVIATIONS</i>	
'TISCHLER' LINEAR (T)	10-YEAR COHORT (10C)
ORANGE COUNTY PLANNING (OCP)	5-YEAR COHORT (5C)
	3-YEAR COHORT (3C)

**Elementary School Level**

- Projections were all high ranging from 4 students to 85 students above actual membership. On average, the projections were 38 students higher than the actual membership.
- The actual membership decreased by 51 students between November 16, 2017 and November 15, 2018.

**Middle School Level**

- Projections were all low, ranging from 7 students to 85 students below actual membership. On average, the projections were 44 students lower than the actual membership.
- The actual membership increased by 100 students between November 16, 2017 and November 15, 2018.

**High School Level**

- Projections were mixed, ranging from 48 students below to 19 students above actual membership. On average, the projections were 17 students lower than the actual membership.
- The actual membership increased by 5 students between November 16, 2017 and November 15, 2018.

**TOTAL**

- The majority of all school level projections were low, ranging from 9 students to 65 students below actual membership. One projection was 21 students above the actual membership. On average, the projections were 23 students lower than the actual membership.
- The membership increased in total by 54 students, which is the sum of -51 at Elementary, +100 at Middle, and +5 at High.



## C. Student Membership Projections

1. **Responsible Entity for Suggesting Change** – The updating of this section will be conducted by the Planning Directors, School Representatives, and Technical Advisory Committee (SAPFOTAC) and referred to the BOCC for annual report certifications. Projections will be distributed to SAPFO partners for review and comments to the BOCC prior to certification.
2. **Definition** – The result of the average of the five student projection models represented by 10 year numerical membership projections by school level (Elementary, Middle, and High) for each school district (Chapel Hill/Carrboro City School District and Orange County School District).
3. **Standard for:**

<b>Chapel Hill Carrboro School District</b>	<b>Orange County School District</b>
The 5 model average discussed in Section II.B (Student Projection Methodology)	The 5 model average discussed in Section II.B (Student Projection Methodology)
See Attachment II.C.4	See Attachment II.C.3
4. **Analysis of Existing Conditions**

The membership figures and percentage growth on the attachments show a decrease at the Chapel Hill/Carrboro City Schools’ elementary school level and at the Orange County Schools’ high school level. The attachments show an increase at the Chapel Hill/Carrboro City Schools’ middle and high school levels and Orange County Schools’ elementary and middle school levels. Chapel Hill/Carrboro Schools and Orange County Schools projected average annual growth rates have all decreased since the previous year. The projected annual growth rates show positive growth for all three levels in the 10-year projection period. Attachment II.C.3 and Attachment II.C.4 show year by year percent growth and projected level of service (LOS). The projection models were updated using current (November 15, 2018) memberships. Ten years of student membership were projected thereafter.

## **Chapel Hill/Carrboro School District**

### **Elementary**

The previous year (2017-18) projections for November 2018 at this level were overestimated by 38 students. The actual membership decreased by 51 students. Over the previous ten years, this level has shown varying increases in growth rates including a decrease in actual membership in 2009-10 which was most likely due to the shorter enrollment period caused by the institution of the new date requiring kindergarteners to be five years old. Following that dip, membership numbers experienced an increase each year with a significant jump (168 students) in 2011-12 before experiencing a decrease in 2014-15, 2015-16, 2017-18, and this school year. Growth rates during the past ten years have ranged from -1.57% to +3.17%. The district's eleventh elementary school, Northside Elementary School, opened in 2013. Capacity was decreased in 2017-18 due to changes in class size averages for kindergarten to third grade by the North Carolina State Legislature. The need for an additional elementary school is not anticipated in the 10-year projection period. This is similar to last year's projections.

Although not included in SAPFO school capacity or membership numbers, Pre-K programs continue to impact operations at District elementary schools where Pre-K programs exist. Specific impacts of Pre-K programs at the elementary school level will continue to be reviewed and discussed in the coming year.

### **Middle**

The previous year (2017-18) projections for November 2018 for this level were underestimated by 44 students. The actual membership increased by 100 students. Over the previous ten years, this level has shown varying increases before experiencing a decrease in 2015-16 and 2016-17. Growth rates during this time period have ranged from -0.59% to +2.86%. Capacity was increased in 2014 with the opening of the Culbreth Middle School science wing. The need for an additional middle school is not anticipated in the 10-year projection period. This is similar to last year's projections.

### **High School**

The previous year (2017-18) projections for November 2018 for this level were underestimated by 17 students. The actual membership increased by 5 students. Over the previous ten years, change has been variable with decreases in membership in five of the ten years. Growth rates

## *Section II*

during this time period have ranged from -0.90 to +4.39%. The need for additional high school capacity at Carrboro High School is not anticipated in the 10-year projection period. This is similar to last year's projections. Due to renovations to Chapel Hill High School, this level will experience an increase in capacity of 105 seats for the 2020-21 school year.

### ***Additional Information for Chapel Hill/Carrboro School District***

Following the economic downturn, there has been an increase in residential projects, specifically multifamily development, in the Town of Chapel Hill. Currently, there are over four thousand proposed single family and multifamily housing units approved, but undeveloped in the CHCCS district. As previously stated, proposed growth is not included in the SAPFO projection system until actual students begin enrollment. The CAPS test is conducted during the approval process at a certain stage. Once students are enrolled in a school year, through annual reporting of student membership numbers, 10-year student projections can be updated to display future capacity needs in time to efficiently plan for future school construction requests. Staff and the SAPFO Technical Advisory Committee will continue to monitor and evaluate the demand and growth of residential development in Chapel Hill and Carrboro as well as its effect on student membership rates.

Charter schools are not included as part of the SAPFO Annual Report and, as a result, their membership and capacity numbers are not monitored or included in future projections. However, the SAPFO Technical Advisory Committee does monitor charter schools and their effect on student enrollment at both school districts. If a charter school does close and a spike is realized in school enrollment, the student projections will likely accelerate the need in future years, still within an appropriate time for CIP planning. Charter Schools are additionally monitored by the Department of Public Institution (DPI) which provides pupil information, based on data received from Charter Schools located in Orange County, to the County for funding purposes.

### **Orange County School District**

#### **Elementary**

The previous year (2017-18) projections for November 2018 at this level were underestimated by 44 students. Actual membership increased by 22 students. Over the previous ten years, this level experienced positive growth before experiencing decreases in 2014-15, 2016-17, and 2017-18. Growth rates during this period have ranged from -5.07% to +2.30%. In the Orange County

## *Section II*

school system, historic growth is more closely related to new residential development than in the Chapel Hill/Carrboro School District, which has a sizeable number of new families in older, existing housing stock. Capacity was decreased in 2017-18 due to changes in class size averages for kindergarten to third grade by the North Carolina State Legislature. The need for an additional Elementary School is not anticipated in the 10 year projection period. This is similar to last year's projections.

Although not included in SAPFO school capacity or membership numbers, Pre-K programs continue to impact operations at District elementary schools where Pre-K programs exist. Specific impacts of Pre-K programs at the elementary school level will continue to be reviewed and discussed in the coming year.

### **Middle**

The previous year (2017-18) projections for November 2018 for this level were overestimated by 6 students. The actual membership increased by 49 students. Over the previous ten years, growth has varied widely and includes decreases in student membership in four of the ten years. Growth rates during this period have ranged from -2.20% to +4.00%. The district's third Middle School, Gravelly Hill Middle School, opened in October 2006. The need for an additional Middle School is not anticipated in the 10 year projection period. This is similar to last year's projections.

### **High School**

The previous year (2017-18) projections for November 2018 for this level were overestimated by 47 students. The actual membership decreased by 96 students. Over the previous ten years, growth has varied and includes decreases for the last three school years and this year. Growth rates during this period ranged from -1.32% to 4.58%. In 2011-12 student membership increased by 32 while capacity decreased by 199 at Orange County High School as a result of a N.C. Department of Public Instruction (DPI) study. Similar to last year's projections, the need for additional capacity at Cedar Ridge High School is not anticipated in the 10 year projection period. However, to address public safety concerns with the current high school capacity exceeding the 100% threshold, Orange County Schools is in preliminary planning stages to expand Cedar Ridge High School from initial capacity of 1,000 students to 1,500 students for the 2021-22 school year.



## *Section II*

### ***Additional Information for Orange County School District***

The City of Mebane lies partially within Orange County and students within the Orange County portion of Mebane attend Orange County schools. However, the City of Mebane is not a party to the SAPFO agreement and therefore does not require that CAPS (Certificate of Adequate Public Schools) be issued prior to development approvals. Following the economic downturn, there has been a slight increase in approved and undeveloped residential development in the City of Mebane and the Town of Hillsborough. Currently, there are over one thousand proposed single family and multifamily housing units approved, but undeveloped in the City of Mebane and the Town of Hillsborough. The residential growth that has occurred in the recent past within Mebane's and Hillsborough's jurisdiction has yet to be seen with OCS student membership numbers and fully realized into the historically based projection methods due to the recession, charter schools, and possibly new family dynamics effecting family size. Staff and the SAPFO Technical Advisory Committee will need to continue monitoring and evaluating the demand and growth of residential development in Mebane and Hillsborough as well as its effect on student membership rates.

Currently, there are two Charter Schools located in the Town of Hillsborough. Eno River Academy (K-12) serves 655 students and The Expedition School (K-8) serves 355 students. Both of these charter schools continue to have an effect on OCS membership numbers. Charter schools are not included as part of the SAPFO Annual Report and, as a result, their membership and capacity are not monitored or included in future projections. However, the SAPFO Technical Advisory Committee does monitor charter schools and their effect on student enrollment at both school districts. If a charter school were to close and a spike were to be realized in school enrollment, the student projections will likely accelerate the need for additional capacity in future years, still within an appropriate time for CIP planning. Charter Schools are also monitored by the Department of Public Institution (DPI) which provides pupil information, based on data received from Charter Schools located in Orange County, to the County for funding purposes.

#### ***5. Recommendation:***

Use statistics as noted in 3 above







Attachment II.C.3 – Orange County Student Projections (Elementary, Middle, & High) (2018-19)

OCS Student Projections (1) (4)

School Year	2009-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	3,165	3,211	3,285	3,346	3,403	3,433	3,250	3,318	3,263	3,193	3,205	3,217	3,229	3,241	3,254	3,266	3,278	3,290	3,302	3,314	3,327
Teacher (2)																					
OC Planning																					
10 Year Growth																					
3 Year Growth																					
Average	7	48	74	63	65	30	(174)	69	(26)	(110)	22	8	49	16	43	47	28	29	29	28	27
Capacity - 100% Level of Service	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694
Number of Students, Actual and Projected, Over (Under) 100% LOS	(529)	(483)	(609)	(346)	(291)	(261)	(435)	(376)	(401)	(478)	(156)	(148)	(89)	(83)	(40)	6	34	63	91	119	147
107% Level of Service	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879
Number of Students, Actual and Projected, Over (Under) 107% LOS	(714)	(668)	(804)	(541)	(486)	(456)	(630)	(571)	(646)	(723)	(271)	(263)	(194)	(188)	(91)	17	46	75	103	131	159
Actual % Level of Service	85.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%	89.9%
Annual Student Growth Rate (3)	0.22%	1.46%	2.30%	1.92%	1.64%	0.86%	-4.97%	-1.81%	-0.75%	-3.46%	0.69%	0.23%	1.52%	0.60%	1.24%	0.62%	0.82%	0.85%	0.85%	0.81%	0.72%

(1) It is important to note that this reflects the November 15, 2018 OCS enrollment as defined by the School Adequacy Public Funding Conference. (2) The teacher model provides for the "True" number of projections to state CHCC and OCS. Original projections used in year year projection model includes "True" Enrollment Method" to CHCC. (3) Annual growth rate calculated using the enrollment for years 2009-2010 through 2018-2019 and average remaining for years 2019-20 through 2028-29. (4) Class size for grades K-12 for the school year 2020-2021 based on the opening of OCS Elementary #10, 50 classrooms and 120 seats to be added by year 2020-2021. Capacity decreases due to change in class size ratio per house bill 10-3 average 4.160 seats per class, 4.116 seats per class by 2020-2021.

OCS Student Projections(1)

School Year	2009-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	1,611	1,623	1,635	1,647	1,658	1,642	1,623	1,623	1,621	1,623	1,623	1,623	1,623	1,623	1,623	1,623	1,623	1,623	1,623	1,623	1,623
Teacher (2)																					
OC Planning																					
10 Year Growth																					
3 Year Growth																					
Average	64	33	6	200	63	15	(20)	(61)	(61)	(61)	6	49	11	(62)	(61)	(61)	(61)	(61)	(61)	(61)	(61)
Capacity - 100% Level of Service	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166
Number of Students, Actual and Projected, Over (Under) 100% LOS	(555)	(543)	(531)	(520)	(508)	(496)	(484)	(472)	(460)	(448)	(436)	(424)	(412)	(400)	(388)	(376)	(364)	(352)	(340)	(328)	(316)
107% Level of Service	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318
Number of Students, Actual and Projected, Over (Under) 107% LOS	(717)	(705)	(693)	(681)	(669)	(657)	(645)	(633)	(621)	(609)	(597)	(585)	(573)	(561)	(549)	(537)	(525)	(513)	(501)	(489)	(477)
Actual % Level of Service	73.9%	76.9%	79.4%	76.7%	77.7%	80.7%	81.3%	80.3%	79.6%	79.9%	82.1%	82.6%	80.2%	79.9%	79.0%	79.8%	79.9%	81.2%	82.9%	83.0%	84.3%
Annual Student Growth Rate (3)	-2.20%	4.07%	1.99%	0.36%	-1.17%	3.74%	0.96%	-1.31%	-0.96%	0.39%	2.53%	0.60%	-2.32%	-0.36%	-1.19%	1.03%	0.05%	1.65%	2.09%	0.89%	0.89%

(1) It is important to note that this reflects the November 15, 2018 OCS enrollment as defined by the School Adequacy Public Funding Conference. (2) The teacher model provides for the "True" number of projections to state CHCC and OCS. Original projections used in year year projection model includes "True" Enrollment Method" to CHCC. (3) Annual growth rate calculated using the enrollment for years 2009-2010 through 2018-2019 and average remaining for years 2019-20 through 2028-29.

OCS Student Projections (1)

School Year	2009-09	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	2,292	2,271	2,221	2,283	2,318	2,401	2,500	2,469	2,446	2,445	2,440	2,398	2,363	2,365	2,363	2,363	2,411	2,420	2,420	2,420
Teacher (2)																				
OC Planning																				
10 Year Growth																				
3 Year Growth																				
Average	41	(26)	5	61	32	106	81	(30)	(22)	(10)	(96)	(1)	38	(90)	(90)	(6)	(27)	(17)	(40)	12
Capacity - 100% Level of Service	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658	2,658
Number of Students, Actual and Projected, Over (Under) 100% LOS	(316)	(384)	(336)	(276)	(124)	(15)	63	30	7	6	(90)	(91)	(89)	(85)	(81)	(64)	(69)	(69)	(65)	(64)
107% Level of Service	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814	2,814
Number of Students, Actual and Projected, Over (Under) 107% LOS	(522)	(590)	(542)	(482)	(330)	(21)	114	(27)	(23)	(34)	(100)	(101)	(99)	(95)	(91)	(74)	(79)	(79)	(75)	(74)
Actual % Level of Service	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%	87.0%
Annual Student Growth Rate (3)	1.86%	-1.12%	0.22%	2.76%	1.40%	4.66%	3.86%	-1.32%	-0.93%	-0.04%	-3.95%	-0.65%	1.00%	0.71%	1.69%	-1.24%	0.26%	-0.72%	1.19%	0.42%

(1) It is important to note that this reflects the November 15, 2018 OCS enrollment as defined by the School Adequacy Public Funding Conference. (2) The teacher model provides for the "True" number of projections to state CHCC and OCS. Original projections used in year year projection model includes "True" Enrollment Method" to CHCC. (3) Annual growth rate calculated using the enrollment for years 2009-2010 through 2018-2019 and average remaining for years 2019-20 through 2028-29.



Attachment II.C.4 – Chapel Hill/Carrboro Student Projections (Elementary, Middle, & High) (2018-19)

CHCCS Student Projections (1) (4)

Elementary	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
School Year	5,302	5,219	5,296	5,464	5,543	5,554	5,541	5,501	5,567	5,522	5,471										
Teacher (2)																					
DC Planning																					
10 Year Growth																					
5 Year Growth																					
3 Year Growth																					
Average	129	(63)	77	168	79	111	(13)	(47)	66	(45)	(61)	(74)	(44)	(30)	(24)	(69)	(49)	(47)	(47)	(45)	(42)
Capacity - 100% Level of Service (LOS)	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244	5,244
Number of Students, Actual and Projected, Over (Under) 100% LOS	68	(20)	50	220	298	(75)	(228)	(228)	(228)	(228)	(228)	(216)	(220)	(185)	(165)	(85)	(111)	(85)	(38)	81	122
Capacity - 105% Level of Service (LOS)	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506	5,506
Number of Students, Actual and Projected, Over (Under) 105% LOS	(204)	(207)	(210)	(142)	37	(666)	(679)	(619)	(653)	(626)	(476)	(469)	(603)	(473)	(448)	(300)	(341)	(294)	(247)	(202)	(180)
Actual % Level of Service	101.1%	99.9%	101.0%	104.2%	105.7%	95.3%	94.4%	95.5%	97.5%	97.5%	97.7%	99.3%	96.1%	98.3%	97.1%	98.1%	99.0%	99.9%	100.0%	101.4%	102.7%
Annual Student Growth Rate (3)	2.89%	-1.57%	1.48%	3.17%	1.46%	-0.23%	-0.72%	1.20%	-0.81%	-0.92%	-0.82%	-0.41%	-0.62%	0.56%	0.49%	1.07%	0.89%	0.84%	0.83%	0.78%	0.74%

For November 15, 2025 Certified Capacity Calculations, CHCCS projects Elementary #10 openings for 2020-21 (per 2020-21). In accordance with R.O.C.C. adopted Special Construction Standards, elementary school capacity totals 600 students. The number of total students in West Chapel, Greensboro, is to be reduced from 1,223 to 1,211 the year Elementary #10 opens to allow for prior capital action.

For November 15, 2025 Certified Capacity Calculations, CHCCS projects Elementary #10 openings for 2020-21 (per 2020-21). In accordance with R.O.C.C. adopted Special Construction Standards, elementary school capacity totals 600 students. The number of total students in West Chapel, Greensboro, is to be reduced from 1,223 to 1,211 the year Elementary #10 opens to allow for prior capital action.

CHCCS projections are in blue in this table (per House Bill 102 average) (class size ratio as 1:25 attached to State legislative action)

CHCCS Student Projections (1)

Middle	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
School Year	2,691	2,709	2,722	2,753	2,783	2,805	2,821	2,844	2,823	2,833	2,833	2,833	2,833	2,833	2,833	2,833	2,833	2,833	2,833	2,833	2,833
Teacher (2)																					
DC Planning																					
10 Year Growth																					
5 Year Growth																					
3 Year Growth																					
Average	75	11	14	31	32	73	76	(17)	(15)	(15)	4	100	282	291	293	288	295	294	292	292	298
Capacity - 100% Level of Service (LOS)	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840	2,840
Number of Students, Actual and Projected, Over (Under) 100% LOS	(149)	(130)	(118)	(87)	(65)	(18)	(83)	(100)	(115)	(111)	(111)	(111)	(111)	(111)	(111)	(111)	(111)	(111)	(111)	(111)	(111)
Capacity - 105% Level of Service (LOS)	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038	3,038
Number of Students, Actual and Projected, Over (Under) 105% LOS	(444)	(431)	(417)	(368)	(344)	(191)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)	(998)
Actual % Level of Service	95.0%	95.4%	95.8%	95.9%	95.9%	100.0%	97.2%	95.6%	95.1%	95.2%	95.2%	99.6%	100.0%	100.0%	100.0%	98.3%	98.3%	98.0%	98.0%	100.0%	101.2%
Annual Student Growth Rate (3)	2.88%	0.41%	0.52%	1.14%	1.18%	2.62%	0.10%	-0.99%	-0.53%	-0.44%	0.14%	3.55%	0.97%	0.82%	0.82%	-1.52%	0.21%	0.04%	1.24%	0.78%	0.82%

For November 15, 2025 Certified Capacity Calculations, CHCCS projects Elementary #10 openings for 2020-21 (per 2020-21). In accordance with R.O.C.C. adopted Special Construction Standards, elementary school capacity totals 600 students. The number of total students in West Chapel, Greensboro, is to be reduced from 1,223 to 1,211 the year Elementary #10 opens to allow for prior capital action.

CHCCS projections are in blue in this table (per House Bill 102 average) (class size ratio as 1:25 attached to State legislative action)

Additional 10 new seats at Calverton Middle School

CHCCS Student Projections (1)

High	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
School Year	3,130	3,105	3,140	3,174	3,209	3,246	3,279	3,311	3,301	3,327	3,327	3,327	3,327	3,327	3,327	3,327	3,327	3,327	3,327	3,327	3,327
Teacher (2)																					
DC Planning																					
10 Year Growth																					
5 Year Growth																					
3 Year Growth																					
Average	6	(24)	34	74	82	(50)	(65)	(26)	61	165	165	5	16	24	66	49	188	(10)	620	(23)	12
Capacity - 100% Level of Service (LOS)	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336	3,336
Number of Students, Actual and Projected, Over (Under) 100% LOS	(206)	(229)	(239)	(161)	(79)	(111)	(146)	(174)	(113)	52	57	73	81	1	57	105	88	78	27	3	15
Capacity - 105% Level of Service (LOS)	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219	4,219
Number of Students, Actual and Projected, Over (Under) 105% LOS	(686)	(613)	(623)	(548)	(467)	(669)	(633)	(620)	(601)	(589)	(531)	(415)	(465)	(497)	(431)	(220)	(101)	(50)	(671)	(653)	(633)
Actual % Level of Service	94.7%	94.1%	95.2%	95.5%	95.0%	97.1%	95.2%	95.2%	95.2%	95.1%	101.5%	101.5%	99.0%	100.0%	101.4%	102.7%	102.7%	102.4%	102.0%	101.5%	101.4%
Annual Student Growth Rate (3)	-0.14%	-0.68%	0.94%	2.03%	2.21%	-0.84%	-0.95%	-0.76%	1.65%	4.38%	-4.38%	0.13%	0.60%	0.62%	0.22%	1.49%	0.21%	0.24%	-1.27%	-0.95%	0.82%

For November 15, 2025 Certified Capacity Calculations, CHCCS projects Elementary #10 openings for 2020-21 (per 2020-21). In accordance with R.O.C.C. adopted Special Construction Standards, elementary school capacity totals 600 students. The number of total students in West Chapel, Greensboro, is to be reduced from 1,223 to 1,211 the year Elementary #10 opens to allow for prior capital action.

CHCCS projections are in blue in this table (per House Bill 102 average) (class size ratio as 1:25 attached to State legislative action)

From Academy High School becomes a public school starting 2020-21 (enrollment per year per student capacity)

Chapel Hill High School adding 105 seats.

## D. Student Membership Growth Rate

1. **Responsible Entity for Suggesting Change** – The updating of this section will be conducted by the Planning Directors, School Representatives, and Technical Advisory Committee (SAPFOTAC) each year and referred to the BOCC for annual report certification. Projections will be distributed to SAPFO partners for review and comments to the BOCC prior to certification.
2. **Definition** – The annual percentage growth rate calculated from the projections resulting from the average of the five models represented by 10 year numerical membership projections by school level for each school district. This does not represent the year-by- year growth rate that may be positive or negative, but rather the average of the annual anticipated growth rates over the next 10 years.

**3. Standard for:**

**Chapel Hill/Carrboro School District**

See Attachment II.D.2

**4. Analysis of Existing Conditions:**

**Chapel Hill/Carrboro School District**

The membership figures and percentage growth on the attachments show continued growth at each school level within the system.

Projected Average Annual Growth Rate over next ten years:

Year Projection Made:	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
<b>Elementary</b>	1.11%	0.92%	0.91%	0.36%	0.56%
<b>Middle</b>	1.15%	0.82%	0.95%	0.21%	0.19%
<b>High</b>	1.22%	0.93%	0.72%	0%	0.16%

**Standard for:**

**Orange County School District**

See Attachment II.D.2

**Analysis of Existing Conditions:**

**Orange County School District**

The membership figures and percentage growth on the attachments show continued growth at each school level within the system.

Projected Average Annual Growth Rate over next ten years:

Year Projection Made:	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
<b>Elementary</b>	0.55%	0.80%	0.51%	0.58%	0.91%
<b>Middle</b>	0.09%	0.67%	0.36%	0.13%	0.28%
<b>High</b>	0.39%	0.56%	0.22%	-0.10%	0.21%

**5. Recommendation:**

**Chapel Hill/Carrboro School District**

Use statistics as noted.

**Recommendation:**

**Orange County School District**

Use statistics as noted.

**Attachment II.D.1 – Orange County and Chapel Hill/Carrboro Student Growth Rates  
(Chart dates from 2018-2028 based on 11/15/17 membership numbers) (2017-18)**

**2017-2018**

**Orange County Student Projections**

**Elementary**

School Year	2017-2018 (actual)	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
Membership	3,183	3,161	3,154	3,186	3,198	3,228	3,256	3,284	3,312	3,340	3,367
Average % Increase		-0.56%	-0.25%	1.04%	0.35%	0.96%	0.86%	0.86%	0.86%	0.83%	0.81%

**Middle**

School Year	2017-2018 (actual)	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
Membership	1,730	1,785	1,794	1,730	1,709	1,682	1,701	1,697	1,717	1,733	1,749
Average % Increase		3.19%	0.50%	-3.60%	-1.21%	-1.56%	1.14%	-0.25%	1.20%	0.92%	0.92%

**High School**

School Year	2017-2018 (actual)	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
Membership	2,445	2,396	2,416	2,456	2,474	2,517	2,480	2,448	2,410	2,396	2,419
Average % Increase		-2.01%	0.84%	1.66%	0.74%	1.72%	-1.48%	-1.27%	-1.58%	-0.54%	0.93%

**Chapel Hill/Carrboro Student Projections**

**Elementary**

School Year	2017-2018 (actual)	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
Membership	5,522	5,509	5,467	5,473	5,488	5,504	5,551	5,596	5,641	5,683	5,723
Average % Increase		-0.23%	-0.77%	0.10%	0.27%	0.30%	0.86%	0.80%	0.81%	0.75%	0.70%

**Middle**

School Year	2017-2018 (actual)	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
Membership	2,833	2,889	2,936	2,929	2,924	2,881	2,863	2,854	2,846	2,868	2,892
Average % Increase		1.98%	1.61%	-0.24%	-0.17%	-1.44%	-0.65%	-0.31%	-0.26%	0.76%	0.84%

**High School**

School Year	2017-2018 (actual)	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028
Membership	3,927	3,915	3,930	3,933	3,934	4,028	4,024	4,009	4,004	3,941	3,926
Average % Increase		-0.31%	0.38%	0.07%	0.03%	2.41%	-0.10%	-0.39%	-0.11%	-1.59%	-0.38%



Attachment II.D.2 – Orange County and Chapel Hill/Carrboro Student Growth Rates  
(Chart dates from 2019-2029 based on 11/15/18 membership numbers) (2018-19)

2018-2019

Orange County Student Projections

Elementary		2018-2019 (actual)	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
School Year		3,205	3,213	3,262	3,278	3,321	3,367	3,395	3,424	3,452	3,480	3,508
Membership			0.23%	1.53%	0.50%	1.31%	1.40%	0.83%	0.83%	0.83%	0.81%	0.79%
Average % Increase												

Middle		2018-2019 (actual)	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
School Year		1,779	1,790	1,737	1,731	1,710	1,728	1,729	1,758	1,795	1,811	1,827
Membership			0.60%	-2.93%	-0.36%	-1.19%	1.03%	0.08%	1.65%	2.09%	0.89%	0.89%
Average % Increase												

High School		2018-2019 (actual)	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
School Year		2,349	2,348	2,371	2,388	2,426	2,396	2,390	2,363	2,346	2,386	2,397
Membership			-0.05%	1.00%	0.71%	1.59%	-1.24%	-0.26%	-1.14%	-0.72%	1.70%	0.48%
Average % Increase												

Chapel Hill/Carrboro Student Projections

Elementary		2018-2019 (actual)	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
School Year		5,471	5,448	5,444	5,474	5,498	5,557	5,606	5,653	5,700	5,745	5,787
Membership			-0.41%	-0.08%	0.55%	0.43%	1.07%	0.89%	0.84%	0.83%	0.78%	0.74%
Average % Increase												

Middle		2018-2019 (actual)	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
School Year		2,933	2,962	2,981	2,961	2,943	2,898	2,905	2,904	2,939	2,962	2,988
Membership			0.97%	0.65%	-0.68%	-0.60%	-1.52%	0.21%	-0.04%	1.24%	0.78%	0.86%
Average % Increase												

High School		2018-2019 (actual)	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029
School Year		3,932	3,948	3,972	3,981	4,037	4,066	4,068	4,058	4,007	3,983	3,995
Membership			0.40%	0.62%	0.23%	1.40%	1.21%	-0.44%	-0.24%	-1.27%	-0.58%	0.30%
Average % Increase												



## E. Student / Housing Generation Rate

1. **Responsible Entity for Suggesting Change** – The updating of this section will be conducted by Planning Directors, School Representatives, and Technical Advisory Committee (SAPFOTAC) and referred to the BOCC for certification.  
Projections will be distributed to SAPFO partners for review and comments to the BOCC prior to certification.
2. **Definition** – Student generation rate refers to the number of public school students per housing unit constructed in each school district, as defined in the Student Generation Rate Study completed by TisherBise on October 28, 2014. Housing units include single family detached, single family attached/duplex, multifamily, and manufactured homes.
3. **Standard for:**

<b>Chapel Hill/Carrboro School District</b>	<b>Orange County School District</b>
See Attachment II.E.1	See Attachment II.E.1

4. **Analysis of Existing Conditions:**

At the January 2014 SAPFOTAC meeting, members discussed the increased number of students generated in both school districts from new development, particularly multifamily housing. The SAPFOTAC recommended further evaluation of the adopted Student Generation Rates and the impacts the number of bedrooms a particular housing type may have on student generation rates. As a result, Orange County entered into a contract with TischlerBise to update the student generation rate analysis. The new student generation rates were approved on May 19, 2015 and are shown in Attachment II.E.1. New rates from the 2014 Student Generation Rates for Orange County Schools and Chapel Hill-Carrboro School District Report are based on an inventory of recently built units from January 1, 2004 to December 31, 2013.

It should be noted that students are generated from new housing as well as from existing housing where new families have moved in. The CAPS system estimates new development impacts and associated student generation, but it is important to understand that student increases are a composite of both of these factors. This effect can be dramatic and can vary greatly between areas and districts where either new

## *Section II*

housing is dominant or new families move into a large inventory of existing housing stock.

### **5. *Recommendation:***

*No change at this time.*

Attachment II.E.1 – Current Student Generation Rates (2015)

TischlerBise Student Generation Rates – 2014

Chapel Hill/Carrboro Schools				
	0-3 Bedrooms	4 Bedrooms	5+ Bedrooms	Weighted Average
Single-Family Detached	0.61	0.84	1.13	0.84
	0-2 Bedrooms	3+ Bedrooms		Weighted Average
Single-Family Attached	0.27	0.42		0.38
Multifamily/Other	0.11	0.47		0.18
Manufactured Home	0.268	0.86		0.78
<b>Weight Average for Chapel Hill/Carrboro School District</b>				<b>0.49</b>

Orange County Schools				
	0-3 Bedrooms	4 Bedrooms	5+ Bedrooms	Weighted Average
Single-Family Detached	0.35	0.57	0.57	0.44
	0-2 Bedrooms	3+ Bedrooms		Weighted Average
Single-Family Attached	0.07	0.17		0.15
Multifamily/Other	0.08	0.67		0.17
Manufactured Home	0.67	0.47		0.52
<b>Weight Average for Orange County School District</b>				<b>0.37</b>

Source: Student Generation Rates for Orange County School District and Chapel Hill-Carrboro School District, TischlerBise, October 28, 2014  
Revised May 7, 2015

### **III. Flowchart of Schools Adequate Public Facilities Ordinance Process**

Abstract: The Schools Adequate Public Facilities Ordinance process has two distinct components:

#### **A. Capital Investment Plan (CIP) (Process 1)**

Timeframe: In November of each year, Student Membership and Building Capacity is transmitted from the school districts to the Orange County Board of Commissioners for consideration and approval and used in the following years CIP (e.g. November 15, 2018 membership numbers used to develop a CIP to be considered for adoption in June 2019).

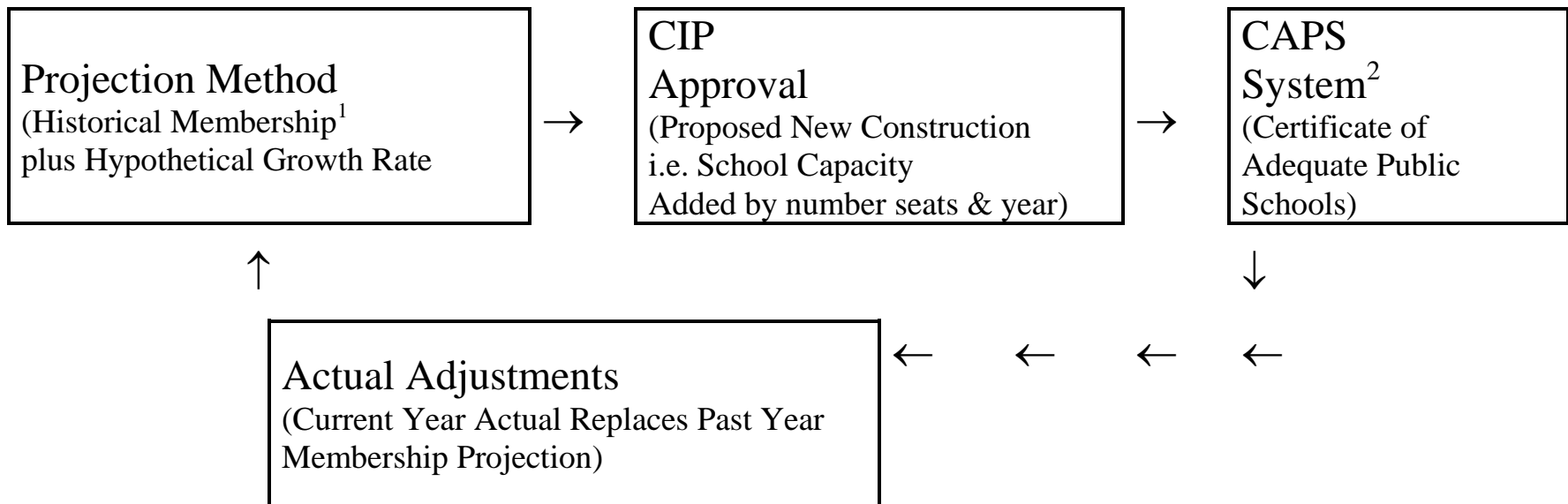
##### **Process Framework**

1. SAPFOTAC projects future student membership from historical data, current membership and hypothetical growth rates from established methodologies.
2. School Districts and BOCC compare projections to existing capacity and proposed Capital Investment Plan.
3. SAPFOTAC forwards data and projections to all SAPFO partners.
4. School Districts develop Capital Investment Plan Needs Assessment during this process
5. The Capital Investment Plan work sessions and Public Hearings are conducted by the BOCC in the spring of each year.
6. The adoption of CIP that sets forth monies and timeframe for school construction (future capacity) by BOCC.



# School Adequate Public Facilities Ordinance

## Process 1 - Capital Investment Planning (CIP)



<sup>1</sup>Historical Membership is a product of students generated from: (1) pre-existing/approved undeveloped lots where new housing is built, (2) existing housing stock with new families/children, and (3) newly approved housing development (in the future this component will be known as CAPS approved development)

<sup>2</sup>The only part of the CAPS System (i.e., computer spreadsheet subdivision tracking) that receives data from the Process 1 CIP includes the actual membership (November 15 of preceding CIP year) and new school capacity amount (seats) in a specific year pursuant to the CIP.

## **B. Schools Adequate Public Facilities Ordinance Certificate of Adequate Public Schools (CAPS) Update (Process 2)**

Timeframe: The CAPS system is updated approximately November 15 of each year when the school districts report actual membership and ‘pre-certified’ capacity, whether it is CIP associated or prior ‘joint action’ agreement. ‘Joint action’ determinations of changes in capacity due to State rules or other non-construction related items are anticipated to be done prior to the November 15 capacity and membership reporting date. This update may reflect the Board of County Commissioners action on the earlier year Capital Investment Plan (CIP) as it affects capacity and addition of new actual fall membership. The Schools Adequate Public Facilities Ordinance Certificate of Adequate Public Schools (CAPS) stays in effect until the following year – (e.g.: November 15, 2005 to November 14, 2006).

New development is originally logged for a certain year. As the CAPS system is updated, each CAPS projection year is ‘absorbed’ by the actual estimate of a given year. Later year CAPS projections of the same development remain in the future year CAPS system accordingly. For example, if a 50-lot subdivision is issued a CAPS, 15 lots may be assigned to “Year 1,” 10 lots to “Year 2,” 10 lots to “Year 3,” 10 lots to “Year 4,” and 5 lots to “Year 5.” When “Year 1” is updated, the students generated from the 15 lots are absorbed by the actual estimate. The students generated in “Years 2, 3, 4, and 5” are held in the CAPS system and added to the appropriate year when the CAPS system is updated.

As previously noted in Section II.C, The City of Mebane is not a party to the SAPFO and does not require that CAPS be issued prior to approving development activities. Increasing development within this area of the county has the potential to encumber a significant portion of the available capacity within the Orange County School District. Although the SAPFO system is not formally regulated in Mebane, staff monitors development activity and when students enter the school system their enrollment is calculated and used in future school projection needs.

Please note that the two processes (CIP and CAPS) are on separate, but parallel tracks. However, the CIP does create a crossover of capacity information between the two processes.

### *Section III*

For example, the SAPFO system for both school districts that will be established / initiated / certified each year in November and is based on prior year created and/or planned CIP capacity and current school year membership. The SAPFOTAC report including new current year membership and projections are to be used for upcoming CIP development as noted in Process 1.

**CIP Process 1** (for CIP 2019 - 2029)

November 2018 – June 2019 (using 2019 SAPFOTAC Report)

**SAPFO CAPS Process 2** (for SAPFO System 2019 – 2020)

November 2018 - November 2019

# School Adequate Public Facilities Ordinance

## Process 2 - Certificate of Adequate Public Schools (CAPS) Allocation

2019 CAPS system is effective November 15, 2018 through November 14, 2019.

The system is updated with new membership, CIP capacity changes, and any other BOCC/School District joint action approved capacity prior to November 15, 2018. This information is received within 5 days of November 15 and posted within the next 15 days. This CAPS system recalibration is retroactive to November 15, 2018.

### CAPS Allocation System

1. Certified Capacity
2. LOS Capacity
3. Actual Membership
4. Year Start Available Capacity
5. Ongoing Current Available Capacity (includes available capacity decreases from approved CAPS development by year)
6. CAPS approved development
  - a. Total units
  - b. Single Family<sup>1</sup>
  - c. Other Housing<sup>1</sup>

### CAPS System

$$AC^2 = SC^2 - (ADM^2 + ND1^2 + ND2^2 + \dots)$$

$AC \geq 0$  - Issue CAPS

$AC < 0$  - Defer CAPS to later date

<sup>1</sup>Student Generation Rates from CAPS housing type create future membership estimate. Please note that this CAPS membership future estimate is different than the projection based on historical data and projection models used in the CIP process 1. This estimate only captures new development impact, which is the component that the SAPFO can regulate.

<sup>2</sup>AC - Available Capacity - Starts at Annual Update Capacity and reduces as CAPS approved development is entered into the system.

SC - Certified School Level Capacity

ADM - Average Daily Membership

ND - New Development; ND1 means first approved CAPS approved development



### OCS Student Projections (1) (4)

#### Elementary

School Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	3,165	3,211	3,285	3,348	3,403	3,433	3,259	3,318	3,293	3,183	3,205										
Tischler (2)												3,217	3,229	3,241	3,254	3,266	3,278	3,290	3,302	3,314	3,327
OC Planning												3,215	3,236	3,259	3,283	3,308	3,334	3,360	3,385	3,407	3,426
10 Year Growth												3,217	3,293	3,314	3,379	3,448	3,482	3,517	3,552	3,588	3,624
5 Year Growth												3,197	3,257	3,265	3,317	3,378	3,412	3,446	3,480	3,515	3,550
3 Year Growth												3,217	3,294	3,311	3,371	3,437	3,471	3,506	3,541	3,577	3,612
Average												3,213	3,262	3,278	3,321	3,367	3,395	3,424	3,452	3,480	3,508
Annual Change - Increase (Decrease) in Actual & Projected Membership	7	46	74	63	55	30	(174)	59	(25)	(110)	22	8	49	16	43	47	28	28	29	28	27
Capacity - 100% Level of Service	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,694	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361	3,361
Number of Students, Actual and Projected, Over (Under) 100% LOS	(529)	(483)	(409)	(346)	(291)	(261)	(435)	(376)	(401)	(178)	(156)	(148)	(99)	(83)	(40)	6	34	63	91	119	147
105% Level of Service	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,879	3,529	3,529	3,529	3,529	3,529	3,529	3,529	3,529	3,529	3,529	3,529	3,529
Number of Students, Actual and Projected, Over (Under) 105% LOS	(714)	(668)	(594)	(531)	(476)	(446)	(620)	(561)	(586)	(346)	(324)	(317)	(267)	(251)	(208)	(162)	(134)	(105)	(77)	(49)	(21)
Actual - % Level of Service	85.7%	86.9%	88.9%	90.6%	92.1%	92.9%	88.2%	89.8%	89.1%	94.7%	95.4%	95.6%	97.0%	97.5%	98.8%	100.2%	101.0%	101.9%	102.7%	103.5%	104.4%
Average - % Level of Service												95.6%	97.0%	97.5%	98.8%	100.2%	101.0%	101.9%	102.7%	103.5%	104.4%
Annual Student Growth Rate (3)	0.22%	1.45%	2.30%	1.92%	1.64%	0.88%	-5.07%	1.81%	-0.75%	-3.34%	0.69%	0.23%	1.53%	0.50%	1.34%	1.40%	0.83%	0.83%	0.83%	0.81%	0.79%

(1) It is important to note that this reflects the November 15, 2018 date of membership as outlined in by the Schools Adequate Public Facilities Ordinance

(2) The Tischler Model provides for the "Linear Method" of projections for both CHCCS and OCS. Original projections used in prior years projection models included the "Linear Extrapolation Method" for CHI

(3) Annual growth rate calculated using actual membership for years 2009-10 through 2018-19 and average membership for years 2019-20 through 2028

(4) Class sizes for grades K-3 = 1:23 for school years 2000 through 2007-08. In accordance with 2005 School Collaboration Work Group direction, effective the 2008-2009 school year with the opening of CHCCS Elementary #10, K-3 class sizes are 1:21 as directed by past State legislative action

Important Note: Per 2005 recommendation of School Collaboration Work Group and approved by BOCC with approval of 2008-09 Membership & Capacity numbers and certification of 2009 SAPFOTAC report of May 5, 2009, Grades K-3 class size reduced from 1:23 to 1:21 with opening of CHCCS Elementary #10-Morris Grove (to allow for prior legislative action re: reduced class size)

Capacity decrease due to change in class size ratios per House Bill 13 (K-3 average class size ratios are 1:20 as directed by State legislative action)

### OCS Student Projections(1)

#### Middle

School Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	1,601	1,665	1,698	1,704	1,684	1,747	1,762	1,739	1,724	1,730	1,779										
Tischler (2)												1,786	1,793	1,799	1,806	1,813	1,820	1,826	1,833	1,840	1,847
OC Planning												1,773	1,775	1,779	1,782	1,786	1,791	1,795	1,822	1,841	1,861
10 Year Growth												1,808	1,726	1,715	1,678	1,706	1,710	1,760	1,815	1,833	1,851
5 Year Growth												1,794	1,700	1,679	1,634	1,652	1,643	1,680	1,725	1,742	1,759
3 Year Growth												1,788	1,693	1,684	1,652	1,683	1,684	1,729	1,779	1,797	1,815
Average												1,790	1,737	1,731	1,710	1,728	1,729	1,758	1,795	1,811	1,827
Annual Change - Increase (Decrease) in Actual & Projected Membership	(36)	64	33	6	(20)	63	15	(23)	(15)	6	49	11	(52)	(6)	(21)	18	1	29	37	16	16
Capacity - 100% Level of Service	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166	2,166
Number of Students, Actual and Projected, Over (Under) 100% LOS	(565)	(501)	(468)	(462)	(482)	(419)	(404)	(427)	(442)	(436)	(387)	(376)	(429)	(435)	(456)	(438)	(437)	(408)	(371)	(355)	(339)
107% Level of Service	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318
Number of Students, Actual and Projected, Over (Under) 107% LOS	(717)	(653)	(620)	(614)	(634)	(571)	(556)	(579)	(594)	(588)	(539)	(528)	(580)	(587)	(607)	(590)	(588)	(560)	(523)	(507)	(491)
Actual - % Level of Service	73.9%	76.9%	78.4%	78.7%	77.7%	80.7%	81.3%	80.3%	79.6%	79.9%	82.1%	82.6%	80.2%	79.9%	79.0%	79.8%	79.8%	81.2%	82.9%	83.6%	84.3%
Average - % Level of Service												82.6%	80.2%	79.9%	79.0%	79.8%	79.8%	81.2%	82.9%	83.6%	84.3%
Annual Student Growth Rate (3)	-2.20%	4.00%	1.98%	0.35%	-1.17%	3.74%	0.86%	-1.31%	-0.86%	0.35%	2.83%	0.60%	-2.93%	-0.36%	-1.19%	1.03%	0.08%	1.65%	2.09%	0.89%	0.89%

(1) It is important to note that this reflects the November 15, 2018 date of membership as outlined in by the Schools Adequate Public Facilities Ordinance

(2) The Tischler Model provides for the "Linear Method" of projections for both CHCCS and OCS. Original projections used in prior years projection models included the "Linear Extrapolation Method" for CHI

(3) Annual growth rate calculated using actual membership for years 2009-10 through 2018-19 and average membership for years 2019-20 through 2028

### OCS Student Projections (1)

#### High

School Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	2,242	2,217	2,222	2,283	2,315	2,421	2,502	2,469	2,446	2,445	2,349										
Tischler (2)												2,358	2,367	2,376	2,385	2,394	2,402	2,411	2,420	2,429	2,438
OC Planning												2,385	2,402	2,420	2,438	2,459	2,479	2,499	2,496	2,504	2,516
10 Year Growth												2,339	2,382	2,419	2,493	2,443	2,432	2,378	2,351	2,420	2,439
5 Year Growth												2,339	2,377	2,399	2,455	2,390	2,361	2,297	2,257	2,305	2,309
3 Year Growth												2,318	2,329	2,327	2,360	2,295	2,276	2,229	2,206	2,270	2,284
Average												2,348	2,371	2,388	2,426	2,396	2,390	2,363	2,346	2,386	2,397
Annual Change - Increase (Decrease) in Actual & Projected Membership	41	(25)	5	61	32	106	81	(33)	(23)	(1)	(96)	(1)	23	17	38	(30)	(6)	(27)	(17)	40	12
Capacity - 100% Level of Service	2,558	2,558	2,558	2,558	2,439	2,439	2,439	2,439	2,439	2,439	2,439	2,439	2,439	2,939	2,939	2,939	2,939	2,939	2,939	2,939	2,939
Number of Students, Actual and Projected, Over (Under) 100% LOS	(316)	(341)	(336)	(275)	(124)	(18)	63	30	7	6	(90)	(91)	(68)	(551)	(513)	(543)	(549)	(576)	(593)	(553)	(542)
110% Level of Service	2,814	2,814	2,814	2,814	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683	2,683	3,233	3,233	3,233	3,233	3,233	3,233	3,233	3,233
Number of Students, Actual and Projected, Over (Under) 110% LOS	(572)	(597)	(592)	(531)	(368)	(262)	(181)	(214)	(237)	(238)	(334)	(335)	(312)	(845)	(807)	(837)	(843)	(870)	(887)	(847)	(836)
Actual - % Level of Service	87.6%	86.7%	86.9%	89.2%	94.9%	99.3%	102.6%	101.2%	100.3%	100.2%	96.3%	96.3%	97.2%	81.3%	82.6%	81.5%	81.3%	80.4%	79.8%	81.2%	81.6%
Average - % Level of Service												96.3%	97.2%	81.3%	82.6%	81.5%	81.3%	80.4%	79.8%	81.2%	81.6%
Annual Student Growth Rate (3)	1.86%	-1.12%	0.23%	2.75%	-1.40%	4.58%	3.35%	-1.32%	-0.93%	-0.04%	-3.93%	-0.05%	1.00%	0.71%	1.59%	-1.24%	-0.26%	-1.14%	-0.72%	1.70%	0.48%

(1) It is important to note that this reflects the November 15, 2018 date of membership as outlined in by the Schools Adequate Public Facilities Ordinance

(2) The Tischler Model provides for the "Linear Method" of projections for both CHCCS and OCS. Original projections used in prior years projection models included the "Linear Extrapolation Method" for CHI

(3) Annual growth rate calculated using actual membership for years 2009-10 through 2018-19 and average membership for years 2019-20 through 2028-29

Partnership Academy Alternative School relocated - capacity added

Orange High capacity decreased, per DPI study

Cedar Ridge High School adding 500 seats.

### CHCCS Student Projections (1) (4)

#### Elementary

School Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	5,302	5,219	5,296	5,464	5,543	5,554	5,541	5,501	5,567	5,522	5,471										
Tischler (2)												5,512	5,554	5,595	5,636	5,677	5,719	5,760	5,801	5,843	5,884
OC Planning												5,417	5,461	5,504	5,546	5,587	5,628	5,654	5,680	5,691	5,690
10 Year Growth												5,423	5,418	5,464	5,489	5,603	5,659	5,715	5,772	5,830	5,888
5 Year Growth												5,473	5,369	5,340	5,332	5,326	5,379	5,433	5,487	5,542	5,598
3 Year Growth												5,418	5,420	5,468	5,485	5,592	5,648	5,704	5,761	5,819	5,877
<b>Average</b>												5,448	5,444	5,474	5,498	5,557	5,606	5,653	5,700	5,745	5,787
<b>Annual Change - Increase (Decrease) in Actual &amp; Projected Membership</b>	129	(83)	77	168	79	11	(13)	(40)	66	(45)	(51)	(74)	(4)	30	24	59	49	47	47	45	42
<b>Capacity - 100% Level of Service (LOS)</b>	5,244	5,244	5,244	5,244	5,244	5,829	5,829	5,829	5,829	5,664	5,664	5,664	5,664	5,664	5,664	5,664	5,664	5,664	5,664	5,664	5,664
<b>Number of Students, Actual and Projected, Over (Under) 100% LOS</b>	58	(25)	52	220	299	(275)	(288)	(328)	(262)	(142)	(193)	(216)	(220)	(190)	(166)	(107)	(58)	(11)	36	81	123
<b>Capacity - 105% Level of Service (LOS)</b>	5,506	5,506	5,506	5,506	5,506	6,120	6,120	6,120	6,120	5,947	5,947	5,947	5,947	5,947	5,947	5,947	5,947	5,947	5,947	5,947	5,947
<b>Number of Students, Actual and Projected, Over (Under) 105% LOS</b>	(204)	(287)	(210)	(42)	37	(566)	(579)	(619)	(553)	(425)	(476)	(499)	(503)	(473)	(449)	(390)	(341)	(294)	(247)	(202)	(160)
Actual - % Level of Service	101.1%	99.5%	101.0%	104.2%	105.7%	95.3%	95.1%	94.4%	95.5%	97.5%	96.6%	96.2%	96.1%	96.6%	97.1%	98.1%	99.0%	99.8%	100.6%	101.4%	102.2%
Average - % Level of Service																					
<b>Annual Student Growth Rate (3)</b>	2.49%	-1.57%	1.48%	3.17%	1.45%	0.20%	-0.23%	-0.72%	1.20%	-0.81%	-0.92%	-0.41%	-0.08%	0.55%	0.43%	1.07%	0.89%	0.84%	0.83%	0.78%	0.74%

Per November 15, 2005 Certified Capacity Calculations, CHCCS projects Elementary #10 opening for school year 2008-09. In accordance with BOCC adopted School Construction Standards, elementary school capacity totals 600 students.  
**Important Note: Per 2005 agreement of School Collaboration Work Group, Grades K-3 class size reduced from 1:23 to 1:21 the year Elementary #10 opens (to allow for prior Legislative Action re: reduced class size)**

Elementary School #11 opens with 585 seats

Capacity decrease due to change in class size ratios per House Bill 13 (K-3 average class size ratios are 1:20 as directed by State legislative action)

(1) It is important to note that this reflects the November 15, 2018 date of membership as outlined in by the Schools Adequate Public Facilities Ordinance. It does not include CHCCS students attending the Hospital School.  
 (2) The Tischler Model provides for the "Linear Method" of projections for both CHCCS and OCS. Original projections used in prior years projection models included the "Linear Extrapolation Method" for CHCC.  
 (3) Annual growth rate calculated using actual membership for years 2009-10 through 2018-19 and average membership for years 2019-20 through 2028-29  
 (4) Class sizes for grades K-3 = 1:23 for school years 2000 through 2007-08. In accordance with 2005 School Collaboration Work Group direction, effective the 2008-2009 school year with the opening of CHCCS Elementary #10, K-3 class sizes are 1:21 as directed by past State legislative action

### CHCCS Student Projections (1)

#### Middle

School Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	2,697	2,708	2,722	2,753	2,785	2,858	2,861	2,844	2,829	2,833	2,933										
Tischler (2)												2,955	2,977	2,999	3,022	3,044	3,066	3,088	3,110	3,132	3,154
OC Planning												2,910	2,908	2,905	2,901	2,897	2,918	2,937	2,963	2,981	2,981
10 Year Growth												3,010	3,008	2,951	2,905	2,814	2,835	2,833	2,921	2,950	2,980
5 Year Growth												2,908	2,976	2,962	2,944	2,871	2,814	2,781	2,748	2,775	2,803
3 Year Growth												3,025	3,036	2,987	2,944	2,866	2,890	2,879	2,962	2,991	3,021
<b>Average</b>												2,962	2,981	2,961	2,943	2,898	2,905	2,904	2,939	2,962	2,988
<b>Annual Change - Increase (Decrease) in Actual &amp; Projected Membership</b>	75	11	14	31	32	73	76	(17)	(15)	4	100	29	19	(20)	(18)	(45)	6	(1)	36	23	26
<b>Capacity - 100% Level of Service</b>	2,840	2,840	2,840	2,840	2,840	2,840	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944	2,944
<b>Number of Students, Actual and Projected, Over (Under) 100% LOS</b>	(143)	(132)	(118)	(87)	(55)	18	(83)	(100)	(115)	(111)	(11)	18	37	17	(1)	(46)	(39)	(40)	(5)	18	44
<b>107% Level of Service</b>	3,039	3,039	3,039	3,039	3,039	3,039	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150
<b>Number of Students, Actual and Projected, Over (Under) 107% LOS</b>	(342)	(331)	(317)	(286)	(254)	(181)	(289)	(306)	(321)	(317)	(217)	(189)	(169)	(189)	(207)	(252)	(246)	(247)	(211)	(188)	(162)
Actual - % Level of Service	95.0%	95.4%	95.8%	96.9%	98.1%	100.6%	97.2%	96.6%	96.1%	96.2%	99.6%	100.6%	101.3%	100.6%	100.0%	98.5%	98.7%	98.6%	99.8%	100.6%	101.5%
Average - % Level of Service																					
<b>Annual Student Growth Rate (3)</b>	2.86%	0.41%	0.52%	1.14%	1.16%	2.62%	0.10%	-0.59%	-0.53%	0.14%	3.53%	0.97%	0.65%	-0.68%	-0.60%	-1.52%	0.21%	-0.04%	1.24%	0.78%	0.86%

Additional 104 new seats at Culbreth Middle School

(1) It is important to note that this reflects the November 15, 2018 date of membership as outlined in by the Schools Adequate Public Facilities Ordinance. It does not include CHCCS students attending the Hospital School.  
 (2) The Tischler Model provides for the "Linear Method" of projections for both CHCCS and OCS. Original projections used in prior years projection models included the "Linear Extrapolation Method" for CHCC.  
 (3) Annual growth rate calculated using actual membership for years 2009-10 through 2018-19 and average membership for years 2019-20 through 2028-29

### CHCCS Student Projections (1)

#### High

School Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
Actual	3,630	3,606	3,640	3,714	3,796	3,764	3,730	3,701	3,762	3,927	3,932										
Tischler (2)												3,962	3,991	4,021	4,051	4,080	4,110	4,140	4,169	4,199	4,229
OC Planning												4,055	4,057	4,058	4,058	4,057	4,031	4,015	3,999	4,007	4,015
10 Year Growth												3,894	3,929	3,932	4,055	4,092	4,040	4,014	3,884	3,867	3,902
5 Year Growth												3,902	3,908	3,900	3,881	4,019	4,017	3,983	3,971	3,846	3,798
3 Year Growth												3,926	3,974	3,995	4,140	4,182	4,144	4,140	4,010	3,996	4,034
<b>Average</b>												3,948	3,972	3,981	4,037	4,086	4,068	4,058	4,007	3,983	3,995
<b>Annual Change - Increase (Decrease) in Actual &amp; Projected Membership</b>	(5)	(24)	34	74	82	(32)	(66)	(29)	61	165	5	16	24	9	56	49	(18)	(10)	(52)	(23)	12
<b>Capacity - 100% Level of Service</b>	3,835	3,835	3,875	3,875	3,875	3,875	3,875	3,875	3,875	3,875	3,875	3,875	3,980	3,980	3,980	3,980	3,980	3,980	3,980	3,980	3,980
<b>Number of Students, Actual and Projected, Over (Under) 100% LOS</b>	(205)	(229)	(235)	(161)	(79)	(111)	(145)	(174)	(113)	52	57	73	(8)	4	57	106	88	78	27	3	15
<b>110% Level of Service</b>	4,219	4,219	4,263	4,263	4,263	4,263	4,263	4,263	4,263	4,263	4,263	4,263	4,378	4,378	4,378	4,378	4,378	4,378	4,378	4,378	4,378
<b>Number of Students, Actual and Projected, Over (Under) 110% LOS</b>	(589)	(613)	(623)	(549)	(467)	(499)	(533)	(562)	(501)	(336)	(331)	(315)	(406)	(397)	(341)	(292)	(310)	(320)	(371)	(395)	(383)
Actual - % Level of Service	94.7%	94.0%	93.9%	95.8%	98.0%	97.1%	96.3%	95.5%	97.1%	101.3%	101.5%	101.9%	99.8%	100.0%	101.4%	102.7%	102.2%	102.0%	100.7%	100.1%	100.4%
Average - % Level of Service																					
<b>Annual Student Growth Rate (3)</b>	-0.14%	-0.66%	0.94%	2.03%	2.21%	-0.84%	-0.90%	-0.78%	1.65%	4.39%	0.13%	0.40%	0.62%	0.23%	1.40%	1.21%	-0.44%	-0.24%	-1.27%	-0.58%	0.30%

Phoenix Academy High School becomes official high school starting 2010-11 school year with 40 student capacity

Chapel Hill High School adding 105 seats.

(1) It is important to note that this reflects the November 15, 2018 date of membership as outlined in by the Schools Adequate Public Facilities Ordinance. It does not include CHCCS students attending the Hospital School.  
 (2) The Tischler Model provides for the "Linear Method" of projections for both CHCCS and OCS. Original projections used in prior years projection models included the "Linear Extrapolation Method" for CHCC.  
 (3) Annual growth rate calculated using actual membership for years 2009-10 through 2018-19 and average membership for years 2019-20 through 2028-29

## ARTICLE IV

### PERMITS AND FINAL PLAT APPROVAL

#### PART IV. ADEQUATE PUBLIC SCHOOL FACILITIES (JULY 17, 2003)

##### **Section 15-88 Purpose.**

The purpose of this Part IV is to ensure that, to the maximum extent practical, approval of new residential development will become effective only when it can reasonably be expected that adequate public school facilities will be available to accommodate such new development.

##### **Section 15-88.1 Certificate of Adequacy of Public School Facilities.**

(a) Subject to the remaining provisions of this part, no approval under this ordinance of a conditional or special use permit for a residential development shall become effective unless and until Certificate of Adequacy of Public School Facilities (CAPS) for the project has been issued by the School District. Notwithstanding the foregoing, this subsection shall not apply to conditional use permits for residential developments less than five lots or dwelling units in the WR, B-5 and WM-3 zoning districts.

(b) A CAPS shall not be required for a general use or conditional use rezoning or for a master land use plan. However, even if a rezoning or master plan is approved, a CAPS will nevertheless be required before any of the permits or approvals identified in subsection (a) of this section shall become effective, and the rezoning of the property or approval of a master plan provides no indication as to whether the CAPS will be issued. The application for rezoning or master plan approval shall contain a statement to this effect.

(c) A CAPS must be obtained from the School District. The School District will issue or deny a CAPS in accordance with the provisions of the Memorandum of Understanding between Carrboro, Chapel Hill, Orange County, and the Chapel Hill Carrboro School District dated July 17, 2003.

(d) A CAPS attaches to the land in the same way that development permission attaches to the land. A CAPS may be transferred along with other interests in the property with respect to which such CAPS is issued, but may not be severed or transferred separately.

##### **Section 15-88.2 Service Levels.**

(a) This section describes the service levels regarded as adequate by the parties to the Memorandum of Understanding described in subsection (b) with respect to public school facilities.

(b) As provided in the Memorandum of Understanding between Orange County, Chapel Hill, Carrboro, and the Chapel Hill/Carrboro School District, adequate service levels for public schools shall be deemed to exist with respect to a proposed new residential development if, given the number of school age children projected to reside in that development, and considering all the factors listed in the Memorandum of Understanding, projected school membership for the elementary schools, the middle schools, and the high school(s) within the Chapel Hill/Carrboro School District will not exceed the following percentages of the building capacities of each of the following three school levels:

Elementary school level	<u>105%</u>
Middle school level	<u>107%</u>
High school level	<u>110%</u>

For the period of time beginning the effective date of this ordinance and terminating on the day on which the third high school within the Chapel Hill-Carrboro City School District is first attended by high school students, the determination by the Chapel Hill-Carrboro City School District that adequate service levels for public schools exist shall be made without regard to whether or not projected capacity of the High School level exceeds 110% of Building Capacity. On and after the day on which the third high school within the Chapel Hill-Carrboro City School District is first attended by high school students, determination by the Chapel Hill-Carrboro City School District that adequate service levels for public schools exist shall be made only if projected capacity of each school level does not exceed the following:

Elementary School	105% of Building Capacity
Middle School	107% of Building Capacity
High School	110% of Building Capacity

For purposes of this ordinance, the terms "building capacity" and "school membership" shall have the same meaning attributed in the Schools Adequate Public Facilities Memorandum of Understanding among the Towns of Carrboro, Chapel Hill, Orange County, and the Chapel Hill/Carrboro Board of Education.

### **Section 15-88.3 Expiration of Certificates of Adequacy of Public School Facilities.**

A CAPS issued in connection with approval of a conditional or special use permit shall expire automatically upon the expiration of such permit approval.

### **Section 15-88.4 Exemption From Certification Requirement for Development with Negligible Student Generation Rates.**

In recognition of the fact that some new development will have a negligible impact on school capacity, a CAPS shall not be required under the following circumstances:



- a. For residential developments restricted by law and/or covenant for a period of at least thirty years to housing for the elderly and/or adult care living and/or adult special needs;
- b. For residential developments restricted for a period of at least thirty years to dormitory housing for university students.

If the use of a development restricted as provided above changes, then before a permit authorizing such change of use becomes effective, a CAPS must be issued just as if the development were being constructed initially.

**Section 15-88.5 Applicability to Previously Approved Projects and Projects Pending Approval.**

(a) Except as otherwise provided herein, the provisions of this part shall only apply to applications for approval of conditional or special use permits that are submitted for approval after the effective date of this ordinance.

(b) The provisions of this part shall not apply to amendments to special or conditional use permit approvals issued prior to the effective date of this ordinance so long as the approvals have not expired and the proposed amendments do not increase the number of dwelling units authorized within the development by more than five percent or five dwelling units, whichever is less.

(c) The Board of Aldermen shall issue a special exception to the CAPS requirement to an applicant whose application for approval of a conditional or special use permit covers property within a planned unit development or master plan project that was approved prior to the effective date of this ordinance, if the Board of Aldermen finds, after an evidentiary hearing, that the applicant has (1) applied to the School District for a CAPS and the application has been denied, (2) in good faith made substantial expenditures or incurred substantial binding obligations in reasonable reliance on the previously obtained planned unit development or master plan approval, and (3) would be unreasonably prejudiced if development in accordance with the previously approved development or plan is delayed due to the provisions of this ordinance. In deciding whether these findings can be made, the Board of Aldermen shall consider the following, among other relevant factors:

- (1) Whether the developer has installed streets, utilities, or other facilities or expended substantial sums in the planning and preparation for installation of such facilities which were designed to serve or to be paid for in part by the development of portions of the planned unit development or master planned project that have not yet been approved for construction;
- (2) Whether the developer has installed streets, utilities, or other facilities or expended substantial sums in the planning and preparation for installation of such

facilities that directly benefit other properties outside the development in question or the general public;

(3) Whether the developer has donated land to the School District for the construction of school facilities or otherwise dedicated land or made improvements deemed to benefit the School District and its public school system;

(4) Whether the developer has had development approval for a substantial amount of time and has in good faith worked to timely implement the plan in reasonable reliance on the previously obtained approval;

(5) The duration of the delay that will occur until public school facilities are improved or exist to such an extent that a CAPS can be issued for the project, and the effect of such delay on the development and the developer.

(d) The decision of the Board of Aldermen involving a special exception application under subsection (c) is subject to review by the Orange County Superior Court by proceedings in the nature of certiorari. Any petition for review by the Superior Court shall be filed with the Clerk of Superior Court within 30 days after a written copy of the decision of the Board of Aldermen is delivered to the applicant and every other party who has filed a written request for such copy with the Clerk to the Board of Aldermen at the time of its hearing on the application for a special exception. The written copy of the decision of the Board of Aldermen may be delivered either by personal service or by certified mail, return receipt requested.

(e) The Mayor or any member temporarily acting as Mayor may, in his or her official capacity, administer oaths to witnesses in any hearing before the Board of Aldermen concerning a special exception.

#### **Section 15-88.6 Appeal of School District Denial of a CAPS.**

The applicant for a CAPS which is denied by the School District may, within 30 days of the date of the denial, appeal the denial to the Board of Aldermen. Any such appeal shall be heard by the Board of Aldermen at an evidentiary hearing before it. At this hearing the School District will present its reasons for the denial of the CAPS and the evidence it relied on in denying the CAPS. The applicant appealing the denial may present its reasons why the CAPS application should have, in its view, been approved and the evidentiary basis it contends supports approval. The Board of Aldermen may (1) affirm the decision of the School District, (2) remand to the School District for further proceedings in the event evidence is presented at the hearing before the Board of Aldermen not brought before the School District, or (3) issue a CAPS. The Board of Aldermen will only issue a CAPS if it finds that the CAPS should have been issued by the School District as prescribed in the Memorandum of Understanding among the School District, Orange County and the towns of Carrboro and Chapel Hill. A decision of the Board of Aldermen affirming the School District may be appealed by the applicant for a CAPS by

proceedings in the nature of certiorari and as prescribed for an appeal under section 15-88.5 of this part.

**Section 15-88.7 Information Required From Applicants.**

The applicant for a CAPS shall submit to the School District all information reasonably deemed necessary by the School District to determine whether a CAPS should be issued under the provision of the Memorandum of Understanding. An applicant for a CAPS special exception or an applicant appealing a CAPS denial by the School District shall submit to the Board of Aldermen all information reasonably deemed necessary by the Board of Aldermen to determine whether a special exception should be granted as provided in Section 15-88.5 or for the hearing of an appeal of a School District denial of a CAPS as provided in Section 15-88.6. A copy of a request for a CAPS special exception or of an appeal of a School District denial of a CAPS shall be served on the superintendent of the School District. Service may be made by personal delivery or certified mail, return receipt requested.

**Section 15-89 through 15-90 Reserved.**

**SCHOOLS ADEQUATE PUBLIC FACILITIES  
MEMORANDUM OF UNDERSTANDING**

This Memorandum of Understanding is entered into this 17 day of July, 2003, by and between the Town of Carrboro, the Town of Chapel Hill, the Chapel Hill-Carrboro City Board of Education (the "School District") and Orange County.

WHEREAS, the portion of Orange County, served by the Chapel Hill/Carrboro School System has for the past decade been experiencing rapid growth in population; and

WHEREAS, this growth, and that which is anticipated, creates a demand for additional school facilities to accommodate the children who reside within new developments; and

WHEREAS, the responsibility for planning for and constructing new school facilities lies primarily with the Chapel Hill/Carrboro School Board, with funding provided by Orange County; and

WHEREAS, Chapel Hill, Carrboro, Orange County and the Chapel Hill School District, have recognized the need to work together to ensure that new growth within the School District occurs at a pace that allows Orange County and the School District to provide adequate school facilities to serve the children within such new developments;

WHEREAS, the parties have worked cooperatively and developed a system wherein school facilities are currently adequate to meet the needs of the citizens of the county and will continue to maintain a Capital Investment Plan (CIP) that is financially feasible and synchronized with historical growth patterns;

NOW, THEREFORE, the parties to this Memorandum hereby agree as follows:

Section 1. The parties will work cooperatively to develop a realistic Capital Improvement Plan for the construction of schools such that, from the effective date of this Memorandum, school membership within each school level (i.e. elementary, middle or high) does not exceed the following:

Elementary School	105% of Building Capacity
Middle School	107% of Building Capacity
High School	110% of Building Capacity

- a. For purposes of this Memorandum, the term "school membership" means the actual number of students attending school as of November 15 of each year. The figure is determined by considering the number of students enrolled (i.e. registered, regardless of whether a student is no longer attending school) and making adjustments for withdrawals, dropouts, deaths, retentions and promotions. Students who are merely absent from



class on the date membership is determined as a result of sickness or some other temporary reason are included in school membership figures. Each year the School District shall transmit its school membership to the parties to this agreement no later than five (5) school days after November 15. Within fifteen (15) school days after receiving the school membership calculations from the School District, the Board of County Commissioners shall approve the School District's school membership calculations.

- b. For purposes of this Memorandum, "building capacity" will be determined by reference to State guidelines and the School District guidelines (consistent with CIP School Construction Guidelines/policies developed by the School District and the Board of County Commissioners) and will be determined by a joint action of the School Board and the Orange County Board of Commissioners. As used herein the term "building capacity" refers to permanent buildings. Mobile classrooms and other temporary student accommodating classroom spaces are not permanent buildings and may not be counted in determining the school districts building capacity. The School District shall transmit its building capacity to the parties to this agreement no later than five (5) school days after November 15. Within fifteen (15) school days after receiving the building capacity calculations from the School District, the Board of County Commissioners shall approve the School District's building capacity calculations.
- c. Prior to the adoption of the ordinances referenced in Section 2, the parties shall reach agreement on the following:
  - (i) A Capital Improvement Program (CIP) that will achieve the objectives of this Memorandum;
  - (ii) A projected growth rate for student membership within the School District's three school levels during the ten year life of the CIP;
  - (iii) A methodology for determining the projected growth rate for student membership; and
  - (iv) The number of students at each level expected to be generated by each new housing type (i.e., the "student generation rate").
- d. After the adoption of the ordinances referenced in Section 2, the Orange County Board of Commissioners may change the projected student membership growth rate, the methodology used to determine this rate, or the student generation rate if the Board concludes that such a change is necessary to predict growth more accurately. Before making any such change, the Board shall receive and consider the recommendation of a staff committee consisting of the planning directors of the Town(s) and the County and a representative of the School District appointed by the Superintendent. The committee shall provide, in a timely manner, a copy of its recommendation to the governing boards of the other parties to this memorandum at the time it provides such recommendation to the Board of

Commissioners and the Board of Commissioners shall provide an opportunity for those governing Boards to comment on the recommendation. In making its recommendation, the committee shall consider the following, and in making its determination, the Board of Commissioners shall consider the following:

- (i) The accuracy of the methodology and projected growth rate then in use, in projecting school membership for the current school year;
- (ii) The accuracy of the student generation rate then in use in predicting the number of students at each level actually generated by each new housing type;
- (iii) Approval of and issuance of CAPS for residential developments that, individually or collectively, are of sufficient magnitude to alter the previously agreed upon school membership growth projections; or
- (iv) Other trends and factors tending to alter the previously agreed upon projected growth rates.

If any such change is made in the projected growth rate, the methodology for determining this rate, or the student generation rate, the Orange County Board of Commissioners shall inform the other parties to this Memorandum prior to February 1<sup>st</sup> in any year in which such change is intended to become effective what change was made and why it was necessary.

- e. The Orange County Board of Commissioners shall provide a copy of the updated CIP to each of the parties to the Memorandum as soon as it is revised, annually or otherwise.

Section 2. The towns and the county will adopt amendments to their respective ordinances, conceptually similar to that attached hereto as Exhibit A, to coordinate the approval of residential developments within the School District with the adequacy of existing and proposed school facilities.

Section 3. The following process shall be followed by the School District to receive and take action upon applications for Certificates of Adequacy of Public School Facilities ("CAPS") submitted by persons who are required by an implementing ordinance conceptually similar to that attached as Exhibit A to have such certificates before the development permission they have received from the town or county becomes effective.

- a. On November 15<sup>th</sup> of each year, the School District shall calculate the building capacity of each school level and the school membership of each school level as of November 15<sup>th</sup> of that year. Also on November 15<sup>th</sup> of each year, the School District shall calculate the projected building capacity for each school level and the projected school membership for

each school level as of November 15<sup>th</sup> in each of the following ten years. These calculations shall be made in accordance with the provisions of Section 1.a and Section 1.b. and also in accordance with the remaining provisions of this section.

- b. On November 15<sup>th</sup> of the year in which the calculation above is made, the school building capacity numbers and the school membership numbers as of November 15<sup>th</sup> of that year are known figures (i.e. not projections). The twelve month period beginning on November 15<sup>th</sup> of the year in which the calculation is made and ending on November 14<sup>th</sup> of the following year is referred to as the “base year.”
- c. Projections of school building capacity as of November 15<sup>th</sup> in each of the ten years following the base year shall be derived from the following:
  - (i) A calculation of the existing building capacity within each school level;
  - (ii) The anticipated opening date of schools under construction;
  - (iii) The anticipated opening date of schools on the ten-year CIP for which funding has been committed by the Board of Commissioners as a result of an approved bond issue, an approved installment purchase agreement, or otherwise; and
  - (iv) The anticipated closing dates of any schools within the School District.
- d. In the first year in which the ordinance adopted pursuant to this Memorandum becomes effective, school membership figures as of November 15<sup>th</sup> in each of the succeeding ten years shall initially be assumed to be the same school membership figures as are determined for the base year. As CAPS are issued during the base year, school membership figures for the base year and succeeding years shall be modified to reflect the additional students from the developments for which CAPS are issued.
- e. On each November 15<sup>th</sup> following the first year in which the ordinance adopted pursuant to this Memorandum becomes effective, school membership figures as of November 15<sup>th</sup> in each of the succeeding ten years shall be determined by adding to the school membership figures for the base year the number of students projected to be added to the schools in each successive year by developments for which CAPS have been issued in accordance with this section.
- f. When an application for a CAPS is submitted, the School District shall determine the impact on school membership for each school level as of November 15<sup>th</sup> in each year of the period-during which the development is expected to be adding new students to the school system as the result of such new construction. In making this determination, the School District shall rely upon the figures established under Section 1 of this Memorandum as to the number of students at each level expected to be generated by each housing type, and data furnished by the applicable

planning department as to the expected rate at which new dwellings within developments similar in size and type to the proposed development are likely to be occupied. Notwithstanding the foregoing, if, upon request of the applicant, the planning jurisdiction approving the development imposes enforceable conditions upon the development (such as a phasing schedule) to limit the rate at which new dwellings within the development are expected to be occupied, then the School District shall take such limitations into account in determining the impact of the development on school membership.

- g. The School District shall determine the amount of available capacity in each school level as of November 15<sup>th</sup> in the base year and each November 15<sup>th</sup> of the succeeding ten years by subtracting from the building capacity numbers for each of those years the student membership numbers for each of those years. The results shall then be compared with the number of students expected to be added to each school level as of November 15<sup>th</sup> in each year (as determined in accordance with subsection 3.f above). The School District shall make that information known to the parties to this agreement within 15 days of the comparison. If the School District determines that the projected remaining capacity of each school level is sufficient to accommodate the proposed development without exceeding the building capacity levels set forth in Section 1 of this Memorandum then the School District shall issue the CAPS. If the School District determines that the projected capacity of each school level is not sufficient to accommodate the proposed development without exceeding the building capacity levels set forth in Section 1, then the School District shall deny the CAPS. If a CAPS is denied, the applicant may seek approval from the appropriate planning jurisdiction of such modifications to the development as will allow for the issuance of a CAPS, and then reapply for a CAPS.
- h. The School District shall issue CAPS on a "first come first served" basis, according to the date a completed application for a CAPS is received. If projected building capacity is not available and an application for a CAPS is therefore denied, the development retains its priority in line based upon the CAPS application date.

Section 4. A CAPS issued in connection with approval of a subdivision preliminary plat, minor subdivision final plat, site plan, or conditional or special use permit shall expire automatically upon the expiration of such plat, plan, or permit approval.

Section 5. The towns and the county will provide to the School District all information reasonably requested by the School District to assist the District in making its determination as to whether the CAPS should be issued.

Section 6. The School District will use its best efforts to construct new schools and permanent expansions or additions to existing schools in accordance with the CIP.

Section 7. Orange County will use its best efforts to provide the funding to carry out the Capital Improvement Plan referenced in Section 1 above.



Section 8. In recognition of the fact that some new development will have a negligible impact on school capacity, a CAPS shall not be required under the following circumstances:

- a. For residential developments restricted by law and/or covenant for a period of at least thirty years to housing for the elderly and/or adult care living and/or adult special needs;
- b. For residential developments restricted for a period of at least thirty years to dormitory housing for university students.

If the use of a development restricted as provided above changes, then before a permit authorizing such change of use becomes effective, a CAPS must be issued just as if the development were being constructed initially.

Section 9. The parties acknowledge that this Memorandum of Understanding is not intended to and does not create legally binding obligations on any of the parties to act in accordance with its provisions. Rather, it constitutes a good faith statement of the intent of the parties to cooperate in a manner designed to meet the mutual objective of all the parties that the children who reside within the School District are able to attend school levels that satisfy the level of service standards set forth herein.

The Town of Carrboro and the Town of Chapel Hill intend to remain committed to the MOU only as long as Orange County continues to execute the CIP as agreed in the MOU. If the Carrboro Board of Aldermen finds Orange County is no longer in compliance with the CIP as outlined in the MOU, the Town of Carrboro will no longer consider itself bound by this MOU and may consider repealing the Ordinance referenced in Section 2 of this MOU. If the Chapel Hill Town Council finds Orange County is no longer in compliance with the CIP as outlined in the MOU, the Town of Chapel Hill will no longer consider itself bound by this MOU and may consider repealing the Ordinance referenced in Section 2 of this MOU.

This the 17 day of July, 2003.

TOWN OF CARRBORO

By: Michael R. Niles  
Mayor

Attest: Sarah B. Williamson  
Town Clerk



TOWN OF CHAPEL HILL

SEAL

By: [Signature]  
Mayor

Attest:

[Signature]  
Town Clerk



THE CHAPEL HILL-CARRBORO BOARD OF EDUCATION

By: [Signature]  
Chair

Attest:

[Signature]  
Secretary



ORANGE COUNTY

By: [Signature]  
Chair, Board of Commissioners

Attest:

[Signature]  
Clerk to the Board of Commissioners



## TOWN OF CARRBORO

NORTH CAROLINA

## TRANSMITTAL

## PLANNING DEPARTMENT

DELIVERED VIA:  HAND  MAIL  FAX  EMAIL**To: Patricia J. McGuire, Planning Director****From: Marty Roupe, Development Review Administrator****Date: March 27, 2019****Subject: Status of CAPS Issuance for Residential Projects**

Projects (Permit and Approval Date)	Density Bonus Units	CAPS Issued (Applies to projects after 6-24-03)
Ballentine (CUP 6/26/07)	18	3-6-08
Claremont AIS (CUP 11/22/05)	12	12-16-05
Claremont II(Claremont II(CUP 3/17/09)	16 and 0	7-23-09 and 3-20-12
Legends at Lake Hogan Farms (CUP 8/22/06)	10	11/22/06
Litchfield AIS ( CUP 6/22/10)	6	7/22/10
Lloyd Harbor AIS (CUP 6/26/07)	2	5/16/10
The Butler (CUP 8/26/08)	5	8/11/11
Veridia (CUP 4/26/11)	0	No
Shelton Station (CUP 4/2/13)	57	12/6/12
Inara Court (SUP 2/15/17)	0	10/6/16
610 Homestead Road (SUP 12/21/16)	0	10/6/16
716 Homestead Road (SUP 9/20/17)	0	7/18/17
CASA Merritt Mill Affordable Housing (CUP 3/27/18)	0	No
Sanderway AIS (CUP 2/26/19)	0	No







# Town of Carrboro

Town Hall  
301 W. Main St.  
Carrboro, NC 27510

## Agenda Item Abstract

**File Number:**19-144

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

### **TITLE:**

Discussion and Request to set a Public Hearing on Land Use Ordinance Amendments Related to Stormwater Management

**PURPOSE:** The purpose of this agenda item is for the Board of Aldermen to discuss options related to post-development rate of discharge stormwater requirements and consider setting a public hearing on an ordinance amending stormwater volume control provisions.

**DEPARTMENT:** Planning

**CONTACT INFORMATION:** Patricia McGuire - 919-918-7327, [pmcguire@townofcarrboro.org](mailto:pmcguire@townofcarrboro.org)

**INFORMATION:** This agenda item addresses two aspects of stormwater management- rate and volume of post-development controls. The Board of Aldermen's request for adjustments to design storm specifications followed discussions of recent developments and community concerns that existing stormwater requirements may not sufficiently address risks associated with uncertain climate and weather patterns and related variability in rainfall. Specific discussions and directions have involved changing the design storm for stormwater quantity regulations from current (i.e. the 1-,2-, 5-, 10-, and 25-year, 24-hour storm event) to include the 50- and 100-year storm event. In the midst of several other projects, staff has been gathering information to understand Carrboro's current regulations in the context of other local governments in North Carolina and elsewhere in and any research that might be useful in informing the Town's selection of updated stormwater requirements. This is a work in progress; to date it has revealed that the Town's use of the 25-year storm event is not used in all locales. This is sometimes countered by a provision found elsewhere to require a "10-percent analysis" in addition to the more common, 10-year design storm standard. In addition to the consideration of expanding stormwater requirements to include storms of lesser probability, staff has also been considering changes to the duration of the storm. One option that is used elsewhere is to require analysis of the 6-hour, 12-hour, and 24-hour storms outright or in relation to the size of the watershed where a development is occurring. Design storm parameters are used for peak flow and runoff volume estimates and for runoff routing. The implications of changing the selected storm is that less frequent, higher-volume storm events will likely increase pipe sizes, the size, location, and number of inlets, the sizes of stormwater ponds and outlet structures. The effect on development projects will vary with their site conditions, but increases in the features noted has associated increased costs. As with the changes in rainfall amounts themselves, the increases are non-linear (see

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

*Attachment B* - NOAA Circular 14/applicable to Carrboro). Some examples of active research projects or recent reports are listed below.

New York City's Department of Environment report, "Innovative & Integrated Stormwater Management"

[http://www.waterrf.org/resources/Lists/PublicSpecialReports/Attachments/18/NYC\\_Stormwater\\_Report.pdf](http://www.waterrf.org/resources/Lists/PublicSpecialReports/Attachments/18/NYC_Stormwater_Report.pdf)

University of Minnesota-led evaluation of the potential impacts to stormwater infrastructure due to climate change

<https://www.cwp.org/climate-change-stormwater-management-capacity-for-community-adaptation-planning/>

A recent study of stormwater engineering standards throughout the nation provides some guidance on the resilience of states based on changes in rainfall and past stormwater management requirements (see *Attachment C* - Lopez-Cantu and Samaras, Environ. Res. Lett. 13 (2018) 074006).

A draft ordinance offering such a change has not yet been prepared as the information gathered to date suggests we have not identified the approach that will best respond to concerns about climate change's effects on the stormwater systems in Carrboro. It is clear that many entities are considering - and struggling somewhat - with establishing new standards. Additional requirements will in most cases cost more than the regulations currently in place, which will raise questions about the appropriate balance between regulation and growth/development. Stormwater management is site-specific, and increased requirements will especially affect infill development, where more intensively managed systems, such as sand filters and underground detention, will be needed to meet higher design storm requirements. A couple of options are offered for the Board's consideration: 1) Continue with current ordinance development focusing on changes to design storm; 2) Direct staff to work with the Stormwater Advisory Commission to review conditions, current requirements, and literature and consider design storm changes with other actions; 3) Direct staff to examine peak flow and other stormwater management provisions and update comprehensively.

For the second topic, a draft ordinance has been prepared to revise the Town's regulations to respond to changes in state agency titles and other terms have been changes. Specifically the establishment of two agencies, DEQ and DEMLR, replacing the role of NCDENR, and the renaming of the BMP manual to the SCM manual. Rather than updating to these new titles, however, the draft ordinance seeks to avoid having to do future amendments because of state administrative reorganizations or changes to the name of software altogether by referencing the state's agencies and actions/tools more generically (*Attachment D*).

The Board of Aldermen must receive public comments before adopting amendments to the Land Use Ordinance. Orange County and Planning Board review are also needed.

**FISCAL & STAFF IMPACT:** Public hearings involve staff and public notice costs associated with advisory board and Board of Aldermen review.

**RECOMMENDATION:** Staff recommends that the Board of Aldermen provide direction regarding stormwater quantity/peak flow discharge rates and consider adoption of the attached resolution setting a public

---

**Agenda Date:** 4/16/2019

**File Type:**Agendas

**In Control:** Board of Aldermen

**Version:** 1

---

hearing date of May 28, and referring the proposed amendment to Orange County and the Planning Board and Stormwater Advisory Commission.

A RESOLUTION SETTING A PUBLIC HEARING ON LAND USE ORDINANCE  
AMENDMENTS RELATED TO STORMWATER VOLUME CONTROL PROVISIONS AND  
MANAGEMENT

WHEREAS, the Board of Aldermen seeks to provide ample opportunities for the public to comment on proposed amendments to the Land Use Ordinance.

NOW, THEREFORE BE IT RESOLVED that the Board of Aldermen provides the following feedback to staff regarding the stormwater quantity/peak-flow discharge rates; and,

BE IT FURTHER RESOLVED that the Board of Aldermen sets a public hearing on May 28, 2019, to consider adopting “a Land Use Ordinance Amendment Related to Stormwater Volume Control Provisions”; and.

BE IT FURTHER RESOLVED that the draft ordinance is referred to Orange County and the Town of Carrboro Planning Board for consideration and recommendation prior to the specified public hearing date; and,

BE IT FURTHER RESOLVED that the draft ordinance is also referred to the following Town of Carrboro advisory boards and commissions.

Appearance Commission

Recreation and Parks Commission

Transportation Advisory Board

Northern Transition Area Advisory Committee

Environmental Advisory Board

Stormwater Advisory Commission

Economic Sustainability Commission

\_\_\_\_\_

This is the 16<sup>th</sup> day of April in the year 2019.



NOAA Atlas 14, Volume 2, Version 3 CHAPEL HILL 2 W

Station ID: 31-1677

Location name: Carrboro, North Carolina, USA\*

Latitude: 35.9086°, Longitude: -79.0794°

Elevation:

Elevation (station metadata): 500 ft\*\*

\* source: ESRI Maps  
\*\* source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) <sup>1</sup>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.411 (0.376-0.449)	0.484 (0.444-0.530)	0.558 (0.511-0.609)	0.615 (0.563-0.672)	0.676 (0.615-0.736)	0.718 (0.651-0.782)	0.756 (0.682-0.824)	0.787 (0.706-0.860)	0.821 (0.730-0.898)	0.849 (0.747-0.928)
10-min	0.657 (0.601-0.718)	0.774 (0.710-0.847)	0.893 (0.818-0.976)	0.984 (0.900-1.07)	1.08 (0.980-1.17)	1.14 (1.04-1.25)	1.20 (1.08-1.31)	1.25 (1.12-1.36)	1.30 (1.16-1.42)	1.34 (1.18-1.46)
15-min	0.821 (0.751-0.897)	0.973 (0.893-1.07)	1.13 (1.03-1.23)	1.25 (1.14-1.36)	1.37 (1.24-1.49)	1.45 (1.31-1.58)	1.52 (1.37-1.66)	1.58 (1.41-1.72)	1.64 (1.45-1.79)	1.68 (1.48-1.84)
30-min	1.13 (1.03-1.23)	1.35 (1.23-1.47)	1.61 (1.47-1.75)	1.80 (1.65-1.97)	2.02 (1.84-2.20)	2.18 (1.98-2.38)	2.33 (2.10-2.53)	2.45 (2.20-2.68)	2.60 (2.31-2.84)	2.72 (2.39-2.97)
60-min	1.40 (1.28-1.53)	1.69 (1.55-1.85)	2.06 (1.89-2.25)	2.35 (2.15-2.56)	2.69 (2.45-2.93)	2.95 (2.68-3.22)	3.20 (2.89-3.49)	3.44 (3.08-3.75)	3.73 (3.32-4.08)	3.97 (3.49-4.34)
2-hr	1.68 (1.53-1.84)	2.03 (1.85-2.22)	2.49 (2.28-2.74)	2.87 (2.61-3.14)	3.33 (3.01-3.64)	3.70 (3.33-4.05)	4.05 (3.62-4.43)	4.40 (3.91-4.82)	4.86 (4.27-5.32)	5.23 (4.56-5.74)
3-hr	1.79 (1.64-1.96)	2.16 (1.98-2.37)	2.66 (2.44-2.92)	3.08 (2.81-3.37)	3.61 (3.27-3.94)	4.04 (3.64-4.41)	4.46 (3.99-4.87)	4.89 (4.34-5.34)	5.46 (4.78-5.96)	5.93 (5.15-6.50)
6-hr	2.15 (1.98-2.35)	2.59 (2.38-2.83)	3.20 (2.94-3.50)	3.71 (3.40-4.05)	4.37 (3.97-4.76)	4.92 (4.44-5.35)	5.47 (4.89-5.94)	6.03 (5.34-6.56)	6.80 (5.93-7.39)	7.44 (6.41-8.11)
12-hr	2.54 (2.34-2.77)	3.06 (2.82-3.34)	3.80 (3.49-4.15)	4.44 (4.06-4.83)	5.28 (4.79-5.73)	5.99 (5.39-6.48)	6.71 (5.98-7.25)	7.47 (6.58-8.06)	8.53 (7.38-9.20)	9.43 (8.04-10.2)
24-hr	2.96 (2.78-3.16)	3.58 (3.36-3.82)	4.47 (4.19-4.77)	5.17 (4.83-5.52)	6.11 (5.70-6.54)	6.86 (6.38-7.34)	7.62 (7.07-8.17)	8.41 (7.77-9.03)	9.50 (8.72-10.2)	10.4 (9.46-11.2)
2-day	3.46 (3.25-3.70)	4.17 (3.91-4.46)	5.17 (4.85-5.53)	5.95 (5.56-6.36)	6.99 (6.51-7.47)	7.81 (7.25-8.35)	8.64 (8.00-9.27)	9.49 (8.75-10.2)	10.7 (9.78-11.5)	11.6 (10.6-12.5)
3-day	3.67 (3.44-3.92)	4.41 (4.13-4.71)	5.44 (5.10-5.81)	6.25 (5.84-6.68)	7.33 (6.83-7.84)	8.19 (7.60-8.77)	9.07 (8.39-9.73)	9.96 (9.18-10.7)	11.2 (10.3-12.1)	12.2 (11.1-13.1)
4-day	3.87 (3.63-4.14)	4.64 (4.35-4.96)	5.71 (5.35-6.10)	6.54 (6.12-6.99)	7.68 (7.15-8.22)	8.57 (7.95-9.19)	9.49 (8.77-10.2)	10.4 (9.61-11.2)	11.7 (10.7-12.7)	12.8 (11.6-13.8)
7-day	4.44 (4.19-4.73)	5.30 (5.00-5.64)	6.44 (6.07-6.86)	7.34 (6.91-7.82)	8.57 (8.04-9.14)	9.54 (8.92-10.2)	10.5 (9.81-11.3)	11.6 (10.7-12.4)	13.0 (11.9-13.9)	14.1 (12.9-15.1)
10-day	5.05 (4.77-5.37)	6.00 (5.67-6.38)	7.21 (6.80-7.66)	8.15 (7.67-8.66)	9.42 (8.85-10.0)	10.4 (9.75-11.1)	11.4 (10.7-12.2)	12.5 (11.6-13.3)	13.9 (12.8-14.9)	15.0 (13.8-16.1)
20-day	6.76 (6.39-7.14)	7.97 (7.54-8.43)	9.41 (8.90-9.95)	10.6 (9.97-11.2)	12.1 (11.4-12.8)	13.3 (12.5-14.1)	14.6 (13.6-15.5)	15.8 (14.7-16.9)	17.5 (16.2-18.7)	18.9 (17.4-20.2)
30-day	8.39 (7.96-8.87)	9.88 (9.36-10.4)	11.5 (10.9-12.1)	12.7 (12.0-13.4)	14.4 (13.5-15.2)	15.6 (14.7-16.5)	16.9 (15.8-17.9)	18.1 (17.0-19.2)	19.8 (18.4-21.0)	21.1 (19.6-22.5)
45-day	10.7 (10.2-11.2)	12.5 (11.9-13.2)	14.3 (13.6-15.0)	15.7 (15.0-16.5)	17.6 (16.7-18.4)	18.9 (18.0-19.9)	20.3 (19.2-21.4)	21.7 (20.4-22.9)	23.5 (22.0-24.8)	24.8 (23.2-26.3)
60-day	12.8 (12.3-13.4)	15.0 (14.3-15.7)	16.9 (16.1-17.7)	18.4 (17.5-19.3)	20.3 (19.3-21.3)	21.7 (20.7-22.8)	23.1 (21.9-24.3)	24.5 (23.2-25.7)	26.2 (24.7-27.6)	27.5 (25.9-29.1)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

LETTER • OPEN ACCESS

## Temporal and spatial evaluation of stormwater engineering standards reveals risks and priorities across the United States

To cite this article: Tania Lopez-Cantu and Constantine Samaras 2018 *Environ. Res. Lett.* **13** 074006

View the [article online](#) for updates and enhancements.

### Related content

- [Contribution of large-scale circulation anomalies to changes in extreme precipitation frequency in the United States](#)  
Lejiang Yu, Shiyuan Zhong, Lisi Pei et al.
- [Groundwater recharge in desert playas: current rates and future effects of climate change](#)  
Owen P McKenna and Osvaldo E Sala
- [Different sensitivities of snowpacks to warming in Mediterranean climate mountain areas](#)  
J I López-Moreno, S Gascoin, J Herrero et al.

# Environmental Research Letters



## LETTER

### OPEN ACCESS

RECEIVED  
6 December 2017

REVISED  
5 May 2018

ACCEPTED FOR PUBLICATION  
22 May 2018

PUBLISHED  
27 June 2018

Original content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](#).

Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.



## Temporal and spatial evaluation of stormwater engineering standards reveals risks and priorities across the United States

Tania Lopez-Cantu<sup>1</sup> and Constantine Samaras<sup>1,2</sup>

<sup>1</sup> Civil and Environmental Engineering, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, Pennsylvania, 15213 United States of America

<sup>2</sup> Author to whom any correspondence should be addressed.

E-mail: [csamaras@cmu.edu](mailto:csamaras@cmu.edu)

**Keywords:** climate change, climate resilience, precipitation, stormwater engineering, adaptation policy

Supplementary material for this article is available [online](#)

### Abstract

Stormwater infrastructure in the United States is designed using governmental precipitation frequency documents and informed by State Departments of Transportation (DOT) guidelines that balance risks and costs. However, both governmental precipitation documents and State DOT guidelines are updated infrequently, which enhances risks in areas where precipitation patterns have changed over time. This study reviewed State DOT design manuals from the 48 contiguous US states and the District of Columbia and found wide variation in design return period standards recommended for similar roadways and infrastructure types. Precipitation differences between successive US precipitation documents for 43 states over the period of 1961–2000 were found to be statistically significant in more than 90% of the study area. These differences indicate that stormwater infrastructure installed prior to the latest update of precipitation frequency documents could be under-designed for present and future climate conditions. Comparing State DOT design storm values for each roadway and infrastructure type, an index for each climate region was developed to assess the relative stringency of each state's requirements. Using these index values, the observed change in precipitation frequency estimates, and each state's design manual publication date, this research identified the states that need to prioritize revision of their stormwater standards to maintain the originally intended design performance over time. Eight out of 43 states were found to have the highest priority for immediately revising their stormwater standards. In addition, these states should assess whether existing infrastructure requires additional adaptive capacity to manage observed precipitation increases. The priority increased for all states under both the RCP 4.5 and RCP 8.5 emissions scenarios for 2050. While local assessments comparing infrastructure costs of increasing the stringency of standards versus the expected costs of future damages under climate change remain necessary, a no-regret action is revising stormwater standards to incorporate observed precipitation increases.

### 1. Introduction

Analyses of long-term precipitation records show evidence that daily precipitation patterns in many regions have changed in the past few decades. In most of the contiguous area of the United States (US), an increase in the frequency and intensity of extreme rainfall has been observed over the twentieth and early twenty-first centuries (Karl and Knight 1998, Karl *et al*

1995, Groisman *et al* 2001, 2005, DeGaetano 2009, Kunkel *et al* 2012, Wu 2015). Although internal climate variability partially explain increasing trends in daily heavy precipitation observed within short periods, long-term changes in the frequency and intensity of extreme events are also attributed to increasing levels of anthropogenic greenhouse gas emissions (Hoerling *et al* 2016, Kim *et al* 2016, Easterling *et al* 2016, Lehmann *et al* 2015). It is projected that these changes

in some regions will be further intensified by climate change, with the magnitude of increases dependent on total greenhouse gas emissions levels (Wilby and Wigley 2002, Wuebbles *et al* 2013). In 2017, Hurricane Harvey delivered 32.47 inches (82.47 cm) of total rainfall in Houston Texas, breaking the largest 3 day precipitation record in a major US city. Other cities in the region received 48-hr rainfall totals exceeding 40 inches (101.6 cm) (NOAA National Centers for Environmental Information 2017, National Weather Service 2017). An assessment on Harvey's extreme rainfall showed that this event had approximately a 1% annual chance of occurring over 1981–2000, but will increase to an 18% annual probability of occurring over 2091–2100 under Intergovernmental Panel on Climate Change (IPCC) AR5 representative concentration pathway 8.5 (Emanuel 2017). For the engineering community and other stakeholders, changing precipitation patterns represent a complex challenge because design standards for both existing and new stormwater infrastructure are based on analyses of historical precipitation records that are likely not representative of future climate conditions (Gibbs 2012). Drainage infrastructure designed to existing standards can be stressed beyond capacity if exposed to higher rainfall conditions, especially if there have been changes in urban landscape, and/or if the soil is saturated preceding extreme rainfall. Failure to convey precipitation runoff from roadways sometimes leads to deadly flash floods, infrastructure failures, or roadway closures (Shepard 2016, IPCC 2012, National Weather Service 2017) resulting in significant socioeconomic consequences, especially in densely populated areas. Stakeholders need robust resilience plans that enhance the performance of existing and new infrastructure that will continue to be used over the coming decades (IPCC 2014). Yet how both existing local infrastructure performance has degraded, and future performance is affected due to increasing precipitation is not well quantified.

In the US, stormwater infrastructure design specifications are provided in national standards, such as (Brown *et al* 2013, AASHTO 2014, ASCE 2017) as well as State and local Departments of Transportation (DOT) design manuals. These standards provide guidance to engineers to size stormwater infrastructure to achieve acceptable performance levels, commonly represented by a design storm. The design storm is specified as the expected average time interval between the occurrence of two precipitation events of the same magnitude (often referred to as design return period), the reciprocal of which represents an annual probability of exceedance. By design, a system's capacity is equal to the rainfall from the storm described by the design return period over a specified time interval. Consequently, selecting a specific design return period assumes a level of failure risk for a single structure. Increasing the design return period increases the level of protection against extreme events and requires

larger pipes to convey the excess runoff in conventional 'gray infrastructure', since higher return period storms produce more rainfall. Increasing the pipe size is likely to increase the total drainage system cost because of material, equipment, and labor costs, and while these cost increases might be small relative to overall project costs, these tradeoffs and associated transaction costs need to be valued and balanced by stakeholders. Under changing climate conditions, designing infrastructure with solely historical information can result in expensive and frequent damages to assets in areas where stormwater systems fail (Arnbjerg-Nielsen *et al* 2013). Pipe enlargement, if combined with other strategies such as green infrastructure, might be cost-effective while meeting acceptable service levels over the life of the infrastructure (Manocha and Babovic 2018). Given the long service life (between 50–100 years) of stormwater infrastructure, uncertainties also exist regarding future land use and travel volumes in the urban environment. Hence, the choice of a design return period is not limited to the standard, but required to reflect a balance between construction costs and expected damage costs from flooding, depending on the conditions where the project will be developed (Mailhot and Duchesne 2010, Zhou *et al* 2012, Wenzel Harry 2013, Wark *et al* 2015).

While some engineering documents (e.g. Brown *et al* 2013) provide guidelines for the selection of design return periods, other documents provide precipitation depths or intensities of expected extreme precipitation for a given duration and return period. Intensity-duration-frequency curves are the most common method to represent the characteristics of extreme rainfall events and are widely used in stormwater infrastructure design (Testik and Gebremichael 2013, McCuen 2016). In the US, federal weather agencies have collected precipitation data and compiled these estimates in standardized governmental precipitation frequency documents. Table 1 shows the publication date and use period for each precipitation document over time. Among the published documents, the Technical Paper 40 (TP40), published in 1961, had extensive use in engineering design in the US (Hershfield 1961, Testik and Gebremichael 2013). In the 1990s, concerns about TP40 being potentially obsolete led to the publication of Atlas 14 by the National Oceanic and Atmospheric Administration (NOAA) (Testik and Gebremichael 2013). Data for six states (Oregon, Washington, Idaho, Wyoming, Montana, and Texas) have not yet been included in the Atlas 14 update (NOAA 2018). Because of an increase (lengthening or newly available) of precipitation records and new statistical approaches used in Atlas 14, shifting from TP40 to Atlas 14 resulted in a change in the precipitation estimates for certain return periods and durations in some areas of the US. Another important feature missing in all precipitation documents prior to Atlas 14, is the quantification of uncertainty. Atlas 14 is the only official rainfall information that provides 90%



**Table 1.** Published standard precipitation-frequency documents used for engineering design in the US.

Document	Publisher	Release date	Active use period	Features and shortcomings	Reference
Rainfall intensity-frequency data	US Department of Agriculture	1935	1935–1953	<ul style="list-style-type: none"> <li>• First extensive study of extreme rainfall</li> <li>• Length of precipitation records analyzed was short</li> </ul>	(Yarnell 1935)
Technical Papers 24, 25, 28 and 29	Weather Bureau	1953, 1954, 1955, 1958, 1960	1953–1960	<ul style="list-style-type: none"> <li>• Extended analysis, proving importance of record length</li> </ul>	(Weather Bureau 1953, 1954) (Weather Bureau 1955, 1956, 1957, 1958a, 1958b, 1959, 1960)
Technical Paper 40 (TP40)	Weather Bureau	1961	1961–2006	<ul style="list-style-type: none"> <li>• Nationwide analysis</li> <li>• Inaccurate estimations for storms shorter than 1 hr and in the western US</li> </ul>	(Hershfield 1961)
Atlas 2 and NWS HYDRO-35	National Oceanic and Atmospheric Administration	1973, 1977	1973–present	<ul style="list-style-type: none"> <li>• Addressed specific flaws of TP40</li> <li>• Still in use for engineering design in the northwestern US and Texas</li> </ul>	(Miller <i>et al</i> 1973a, 1973b, 1973c, 1973d, Frederick <i>et al</i> 1977)
Atlas 14	National Oceanic and Atmospheric Administration	Various depending on volume	2004–present	<ul style="list-style-type: none"> <li>• Analysis of longer precipitation records</li> <li>• Application of statistical techniques allowed for calculation of confidence intervals in their rainfall depth estimations</li> <li>• Evidence and projections of a non-stationary climate threatens the validity of estimations over time</li> </ul>	(Bonnin <i>et al</i> 2006, 2011, Perica <i>et al</i> 2013a, 2013b, 2014).

confidence intervals along with their precipitation depth estimations (Bonnin *et al* 2006, 2011, Perica *et al* 2013a, 2013b, 2014). Because of the change in precipitation estimates (either positive or negative) by replacing TP40 by Atlas 14 in some areas, stormwater systems designed prior to the update of precipitation frequency estimates could be under- or over-designed to handle present conditions described by Atlas 14. For example, a structure designed using a 25 year depth from TP40 may be inadequate to handle increases in rainfall extremes that were observed in the later Atlas 14 data period. In addition, subsequent increases as result of climate change will further degrade the performance of under-designed structures (Guo 2006, Mailhot and Duchesne 2010, Janssen *et al* 2014, Cook *et al* 2017).

Even with the uncertainty in timing and magnitude of future rainfall patterns (Milly *et al* 2008, IPCC 2012, Easterling *et al* 2017) as well as changes in climate variability (Barros and Evans 1997, Barros *et al* 2017), several studies have recognized that these changes must be accounted for and have estimated possible impacts

of climate change on urban stormwater infrastructure design and performance in future climate conditions (Willems *et al* 2012, Mailhot and Duchesne 2010, Semadeni-Davies *et al* 2008, Arisz and Burrell 2006, Cook *et al* 2017).

In this paper, we present a novel and complementary approach to inform resilience assessments of stormwater infrastructure design and assign a level of priority for State DOTs to revise their design standards by characterizing the spatial and temporal variability of minimum design standards for stormwater infrastructure. By analyzing the spatially averaged difference between TP40 and Atlas 14, we show that the acceptable infrastructure failure probabilities (or failure risk) have not remained constant from 1961 to the latest Atlas 14 documents released beginning in 2004. This can inform stakeholders about changes in installed stormwater infrastructure performance and likelihood of failure, as well as the risks of specific design choices of new infrastructure. While a risk assessment for a specific local infrastructure asset includes understanding

exposure, vulnerability, and hazard, we envision our results can serve as an initial screening tool to inform priorities. We classify each state into one of four different priority classes to revise their design standards using the spatially averaged TP40 and Atlas 14 differences, comparing a state's standards with other states in the same climatic region, and noting the DOT design manual publication date. We also evaluate the projected priority for each state in both higher emissions and lower emissions future scenarios using precipitation change projections from the US National Climate Assessment (Easterling *et al* 2017).

## 2. Methods

### 2.1. Stormwater infrastructure design standards in the US

We extracted the minimum design return period standards recommended by each state from the design manuals of the 48 contiguous states and the District of Columbia (DC) (see table S.1 in the supplemental information available at [stacks.iop.org/ERL/13/074006/mmedia](https://stacks.iop.org/ERL/13/074006/mmedia) for the complete description of state design return periods and references). Design return periods are usually specified by type of drainage structure, highway classification, traffic volume, or combinations of these variables. In order to enable comparisons between State DOT guidelines, we made several assumptions to classify each standard. Classifications and general and per state assumptions are described further in section S.1, and S.2. Additionally, we noted which governmental standardized precipitation document was used during the design manual's development. Figure 2 shows a timeline across regions of Atlas 14 release dates, as well as the State DOT design manual publication date for the states within a climate region.

#### 2.1.2. Variability of stormwater engineering standards

We characterized the variability of the minimum design return periods across states using classifications defined in section S.1. For each infrastructure element and highway classification, the coefficient of variation was calculated for all states (shown in figure S.6). We determined the variability of the design standards within NOAA climate regions by developing a normalized regional index from 0–1, which compares state DOT standards within the same region. The regional index is defined in section S.3. Higher index numbers characterize states within a climate region with higher design return periods relative to neighboring states in the same climate region.

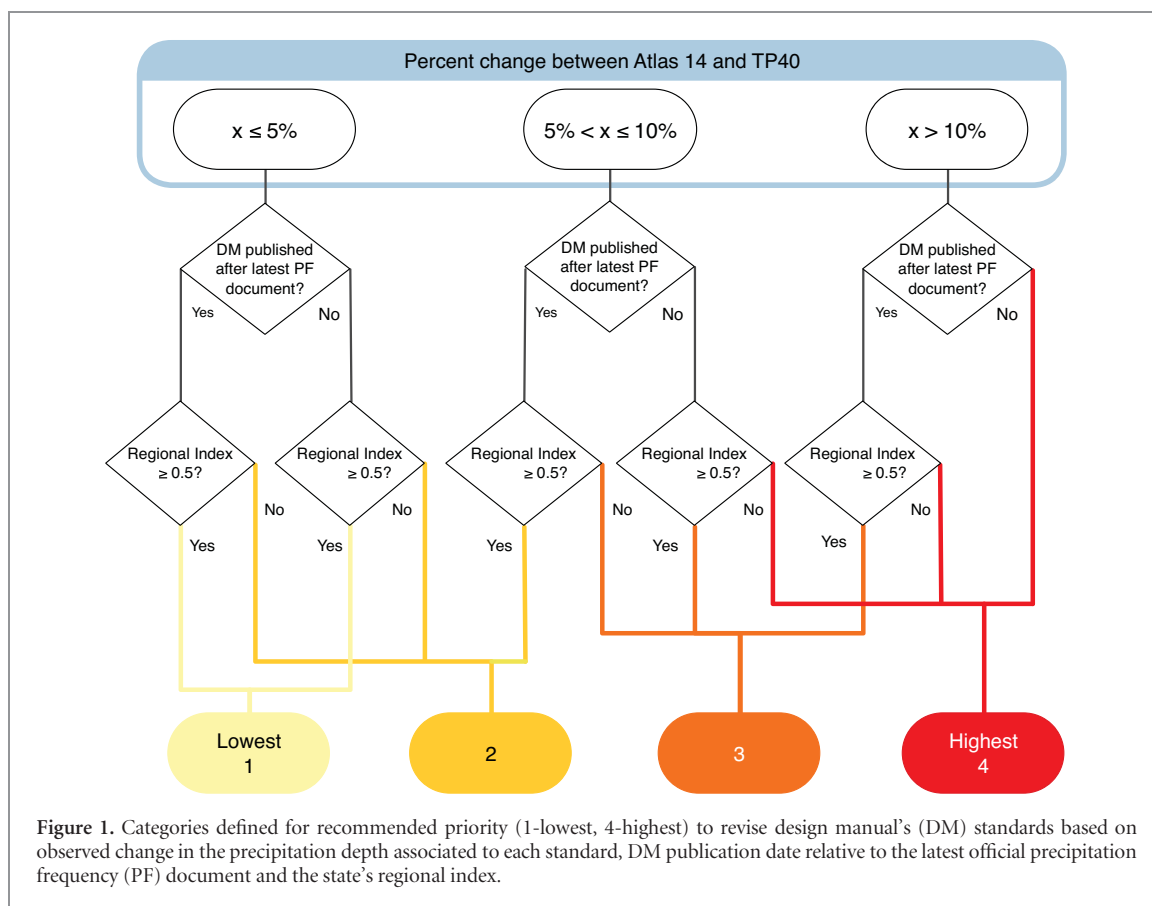
### 2.2. Changes in precipitation frequency estimates

For each 24 hour duration minimum design return period, we estimated the percentage change between the previous (TP40) and current (Atlas 14) precipitation frequency document. When published, Atlas 14

included a comparison with TP40 only for the 100 year return period. However, return periods such as 10-, 25- and 50 year are frequently selected as design standards by State DOTs which motivates further comparison. Using QGIS software (QGIS Development Team 2017), we first digitized TP40 contour maps into vector shapefiles. Subsequently, contour lines for each map were interpolated using an inverse distance weighting algorithm to generate a point-estimate raster map. We retrieved Atlas 14 raster data from the Hydrometeorological Design Studies Center website (NOAA 2017). Finally, the percent change between TP40 and Atlas 14 was computed by subtracting the generated TP40 raster maps from the Atlas 2 or Atlas 14 raster maps and dividing by the corresponding TP40 value. To further illustrate local variation and to reduce potential bias derived from directly interpolating TP40 contour lines, the results were spatially averaged by county.

### 2.3. Identification of states where standards likely require revision

Figure 1 shows the process used to classify states within each priority class. The first level of the flow diagram contains three bins, each with different thresholds for the observed percent change in precipitation. All thresholds are positive, considering only percent increases (i.e. the precipitation depth for a given return period is greater in Atlas 14 than in TP40) because we are only concerned about potential under-design conditions that can lead to flood events. The highest threshold (10%) was selected based on (Niemczynowicz 1989) who found if the precipitation depth of a selected design return period increased by 10% or higher, the system was likely to suffer from stress or even failure during precipitation events defined by such return periods. The second level is a binary decision that is based on whether the latest state DOT design manual publication date is more recent than the latest precipitation frequency document, meaning that the standards provided in this design manual refer to the most updated precipitation estimates. The third level takes the midpoint of the regional index, defined in section 2.1.2 and section S.3, and divides states into groups above and below the midpoint. Since the regional index can vary between 0 and 1, states with regional index values greater than or equal 0.5 implies they have higher return periods than at least half of the states within the same climate region. Infrastructure in states in the top group are considered to have an added climate factor of safety, or the capacity to cope with increases in precipitation depth for a wider range of return periods, than those states with lower standards. For example, a system with an expected service life of 80 years and designed for a 100 year design return period is potentially able to cope with increases in precipitation depths for the 20, 40, 60 and 80 year return periods (Mailhot and Duchesne 2010). On the other hand, a lower minimum standard will be less resilient to changes in



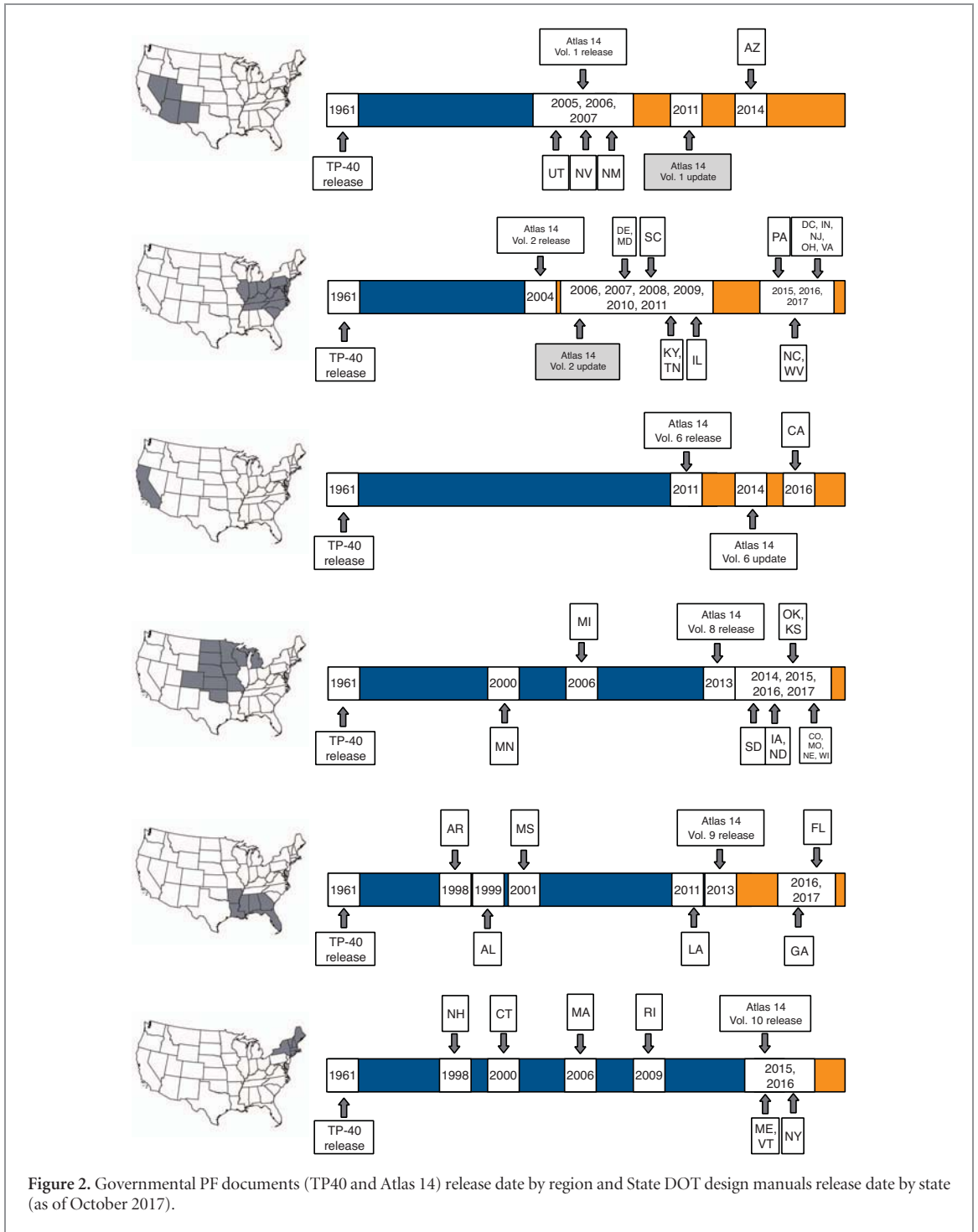
precipitation depth. In the absence of additional information that would allow us to favor weighting the index, each criterion was assigned equal weight. Individual stakeholders could assign weights based on their preferences using our method.

Based on these three criteria, four different priority classes were identified ranging from lowest (1) to highest (4) priority. Recognizing that the percent change in the precipitation depth estimates defined by Atlas 14 and TP40 is based on historical records, we extended the analysis to identify the priority for each state under future climate change. To illustrate how priority levels would change under these future conditions, we classify priority levels using our method and the reported regional percent increases from the National Climate Assessment, assuming the projected increases in return periods above 25 years would be at least as high as projected by the National Climate Assessment for the 20 year return period (Easterling *et al* 2017). If, for example, the percent increase is higher for the 50- and 100 year future events than that of the 20 year, our use of the National Climate Assessment projections would underestimate the future priority. To assign a priority under future climate conditions, the flow diagram remained the same except for the second level which for each state design manual, always corresponded to a negative answer since there is no standardized assessment of local future climate conditions yet.

### 3. Results

#### 3.1. Variability of stormwater design return period standards

Minimum design return periods for each infrastructure type were found to vary considerably across State DOTs (see figures S.5–S.16). The difference is substantial in some cases, for example drainage inlets or storm drain systems show high a coefficient of variation, whereas culvert standards are more homogenous across State DOTs (see figure S.6). This variation implies a different minimum tolerance to failure across State DOTs. The difference could ultimately be associated with the expected damages of failure and infrastructure design and cost differences across states. State DOT officials have different reasons and tradeoffs for determining minimum design return periods. For example, the Arizona DOT states 'the goal in highway drainage design is to minimize off-project impacts while maintaining an acceptable frequency of protection for the highway at near optimal construction as well as maintenance cost.' (Arizona 2012). Funding priorities is another potential justification for the difference across the United States. Meyer (2008) provides an example where federally-aided highway projects must meet federal guidance requirements, and acknowledges that many transportation agencies have developed their own design manuals to provide

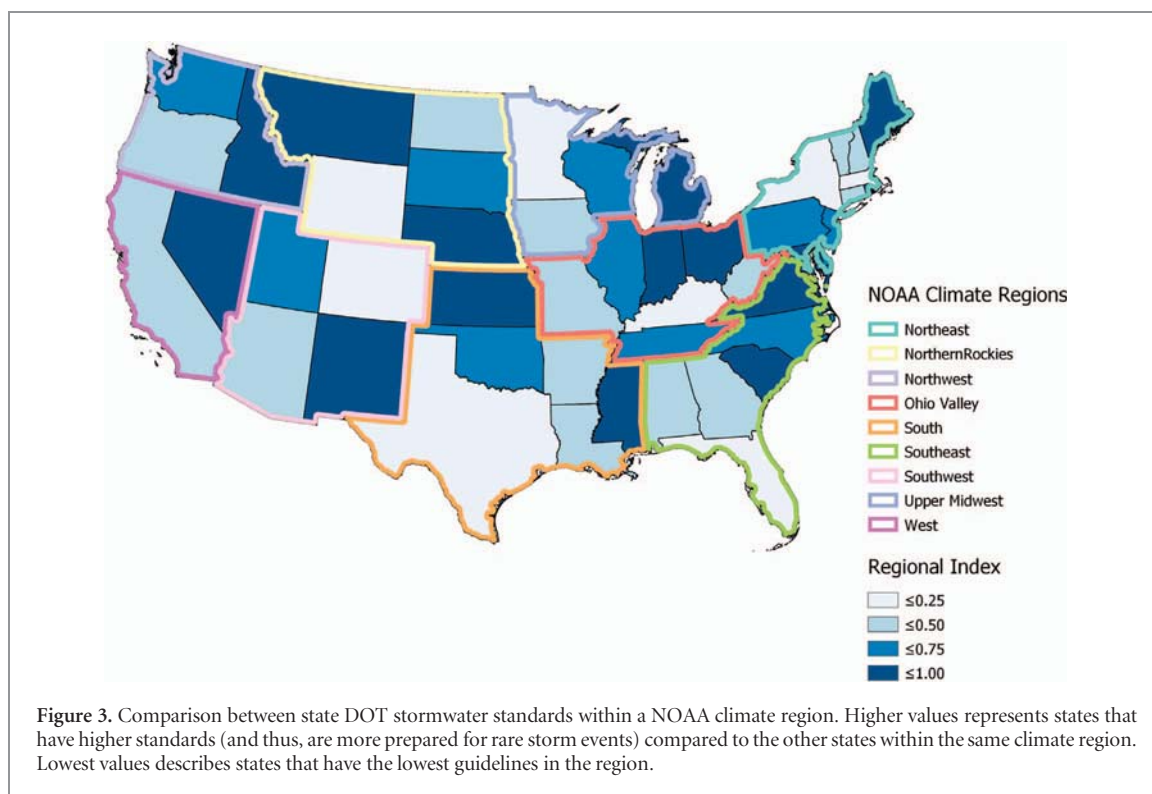


their engineers with guidance (Meyer 2008). The design return periods by drainage structure and roadway functional class varied in most cases more than 50% across the United States. While most states share similar guidelines, there are some states that design for very low design return periods (2 and 3 years) and some for relatively high return periods (50 and 100 years) for the same type of highway and stormwater infrastructure (see figure S.7–S.16 for US maps for each highway class and drainage infrastructure type).

States within the same climate region were also found to have very different minimum standards. Using

the regional index, we identified those states who have higher or lower return periods as design standards compared to other in the same climate region have a higher regional index. Figure 3 shows the regional index of each state by climate region. In the South climate region, Texas has set the lowest minimum return periods for their infrastructure design in comparison with its neighboring states, Arkansas, Mississippi, Oklahoma, Louisiana and Kansas. Louisiana and Arkansas have similar levels of protection, higher than Texas but lower than Oklahoma. Kansas and Mississippi have the greatest level of protection in comparison with the other states in the South climate region.





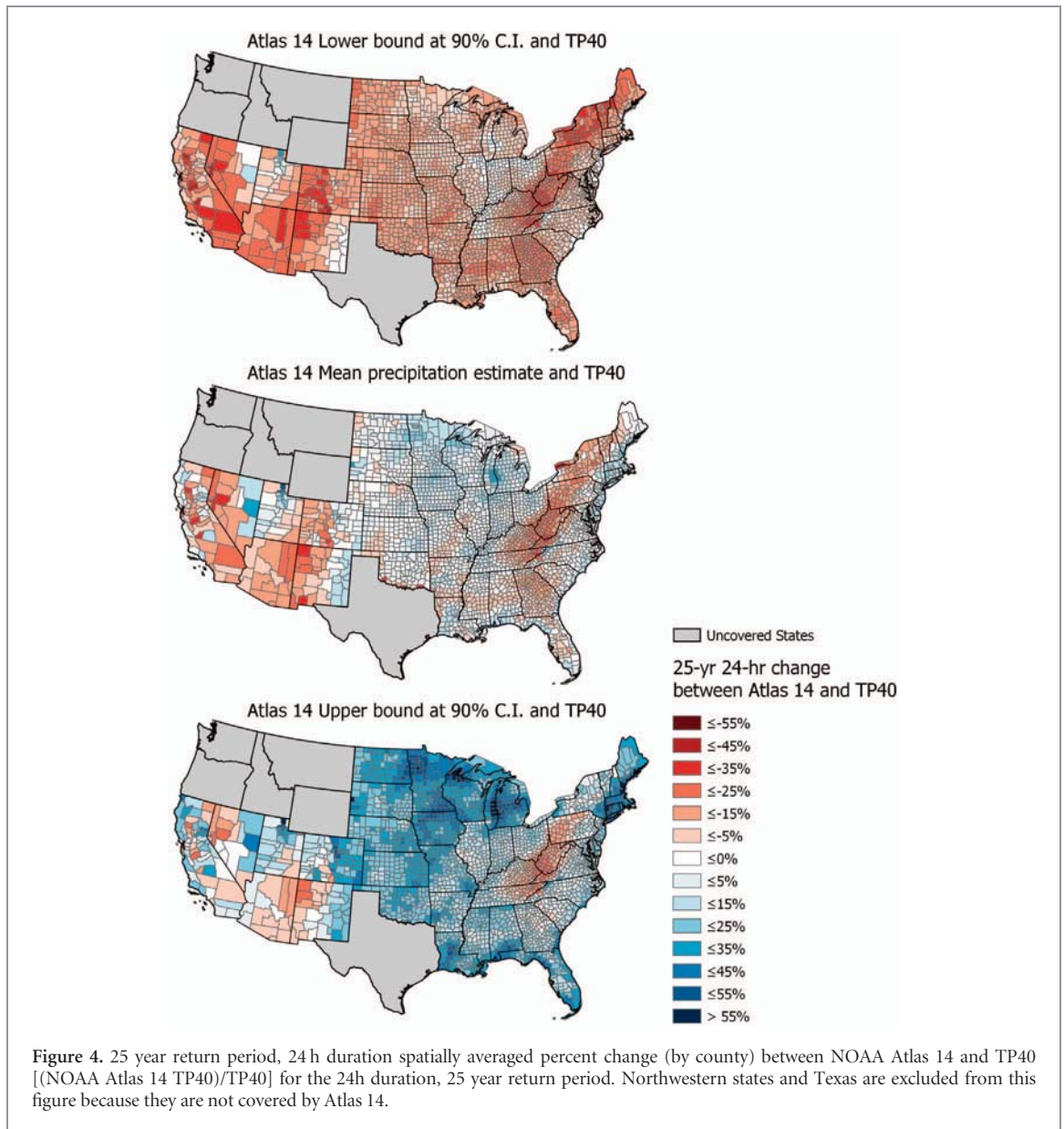
### 3.2. Changes of precipitation depth estimates in official precipitation frequency documents

Figure 4 shows the percent change in precipitation depth estimates for the 25 year return period 24 hour duration storms, from the estimates provided in TP40 compared with those from Atlas 14. Zones in red correspond to a 25 year return period with a smaller precipitation depth estimation in Atlas 14 than in TP40, meaning that the 25 year return period precipitation depth estimate decreased from the past to the present estimate. Likewise, zones in blue correspond to a greater precipitation estimate, meaning that precipitation depths increased from TP40 to the Atlas 14 estimate. The differences found for the 100 year return period were consistent with the previous comparison between TP40 and Atlas 14 made for the 100 year return period in Atlas 14. Larger changes were observed in higher return periods (i.e. 100-, 50- and 25 year) than for smaller return periods (2-, 5-, 10 year). Estimating large return periods with higher accuracy require long precipitation records. Therefore, the larger differences observed in higher return periods can be partially attributed to the considerable lengthening of precipitation records analyzed in Atlas 14 compared to TP40.

For the 25 year return period, some regions experienced considerable changes in precipitation depth estimations between TP40 (released in 1961) and Atlas 14 (released from 2006–2013). For example, the average precipitation depth corresponding to the 25 year return period in Michigan is at least 25% greater than the precipitation depth estimated in TP40 for the same return period. Alternatively, in West Virginia the precipitation depth is at least smaller by 25% between

TP40 and Atlas 14. This means that infrastructure currently in place that was designed before the publication of Atlas 14 could be undersized (such as in Michigan) or oversized (such as in West Virginia). We also compared the precipitation depths from TP40 to the upper and lower bound estimates from Atlas 14 and noted, as shown in figure 4, that a design for the 25 year return period in the Appalachian Mountains under TP40 estimates would be likely oversized even if designed for the upper bound estimate from Atlas 14.

The differences between TP40 and Atlas 14 values were tested for significance at the 95% level using two different tests, the two-tailed paired *t*-test and the Kolmogorov-Smirnov (K-S) test. To generate the samples to be tested, we first generated 50 random points within the state of Rhode Island (smallest state in the US) and scaled the number of points to sample within each state by its area relative to the area of Rhode Island. For each point, we extracted the TP40 and Atlas 14 (pixel value from respective raster maps) value corresponding to the point location. We divided the study area using a hexagonal mesh (approximately 1 degree by 1 degree maximal diameter (approximately same area as Rhode Island), following Karl and Knight (1998) covering the study area. We chose a hexagon grid instead of a rectangular grid because a hexagon mesh is advantageous for the dividing a study area into smaller areas while ensuring the sampling results are representative of all regions (Birch *et al* 2007). For each return period and hexagon shape, we analyzed the evidence to reject the null hypothesis (in the case of the two sample K-S test that both samples are



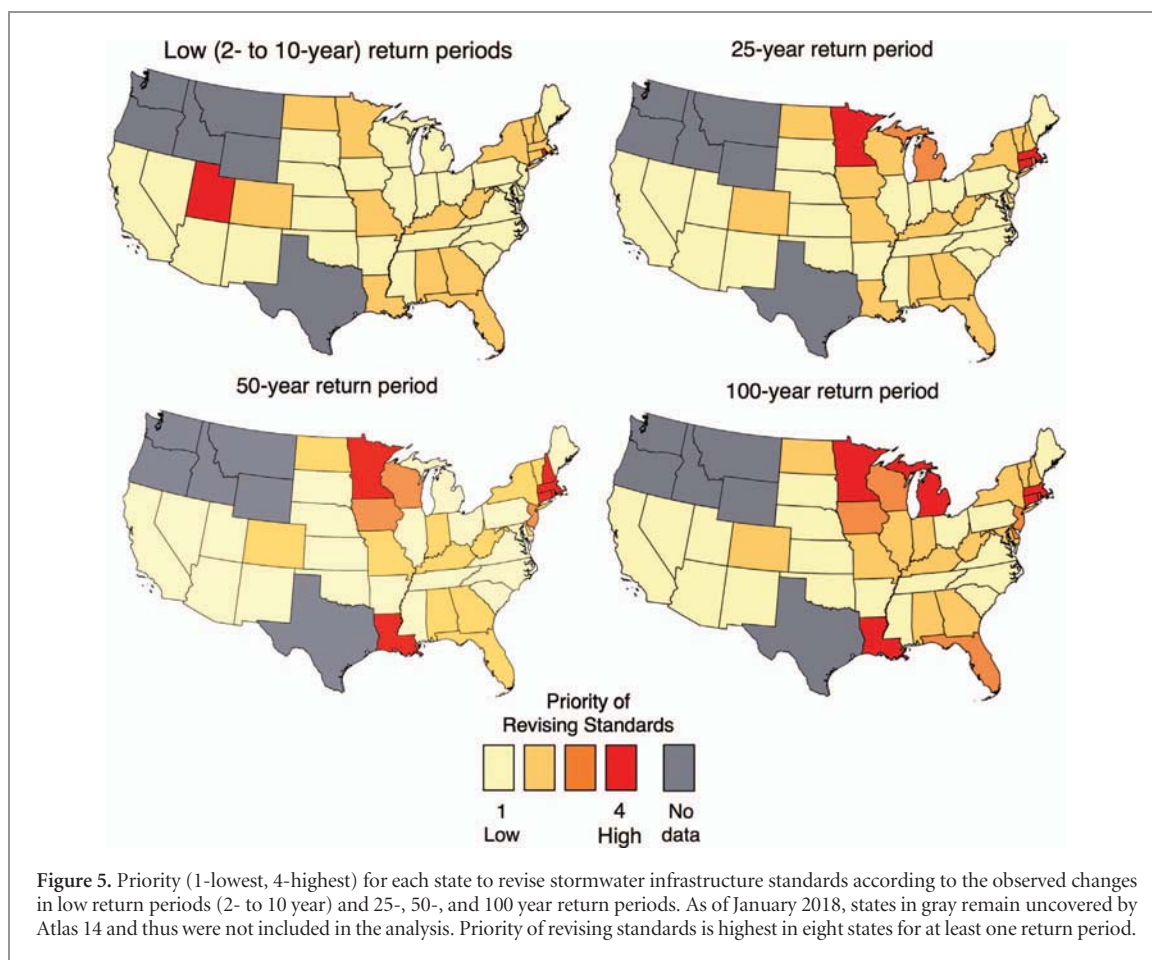
drawn from the same distribution, and in the case of the paired  $t$ -test that the mean difference between the paired observations is zero). We repeated the process 10 times using different sample points to assess the robustness of the results.

For the 25 year return period, the difference between TP40 and Atlas 14 was statistically significant at the 0.05 level using the paired  $t$ -test in 91%–93% of the study area, and 89%–92% of the area using the two sample K-S test. For the same return period, a positive statistically significant difference ( $\mu_{\text{Atlas14}} - \mu_{\text{TP40}} > 0$ ) using the paired  $T$ -test was found in 69.9%–72.1% of the study area at the 0.05 significance level while negative statistically significant difference was found in 5.7%–10.3% of the study area. At the state level, 14 states (out of 43) exhibited positive statistically significant difference in more than 50% of the state area. Table S.6 and table S7 shows a summary of the maximum and minimum statistically significant percentage area of the ten replications for the paired  $T$ -test and

the two sample K-S test while table S.8 shows the percentage area with statistically significant positive difference ( $\mu_{\text{Atlas14}} - \mu_{\text{TP40}} > 0$ ) by state. Sampling regions (hexagons) with statistically significant positive difference are shown in figures S.26 through S.31.

### 3.3. Who should revise stormwater standards?

Using the method described in figure 1 and repeating for each return period used as a design standard, states were classified into four categories to prioritize an update of their stormwater design manuals, 1 being the lowest and 4 the highest priority, as shown in figure 5. States assigned the highest priority to update their design manuals experienced a 10% or greater increase in precipitation between Atlas 14 and TP40, published their current design manual prior to the release of the latest precipitation document, and were estimated to be in the lower half of their regional index for design return period standards. Depending on the average percent increase from Atlas 14 to TP40 for a



**Figure 5.** Priority (1-lowest, 4-highest) for each state to revise stormwater infrastructure standards according to the observed changes in low return periods (2- to 10 year) and 25-, 50-, and 100 year return periods. As of January 2018, states in gray remain uncovered by Atlas 14 and thus were not included in the analysis. Priority of revising standards is highest in eight states for at least one return period.

given return period, a different number of states with high priority were found. Under higher return periods, many states in the Northeast and upper Midwest were found to be in high priority categories. These states should update their design standards to ensure new drainage infrastructure performs under current and projected precipitation levels. In addition, these states should assess whether existing infrastructure requires additional measures such as green infrastructure to serve as adaptive capacity to manage precipitation increases between TP40 and Atlas 14 or further changes due to climate change.

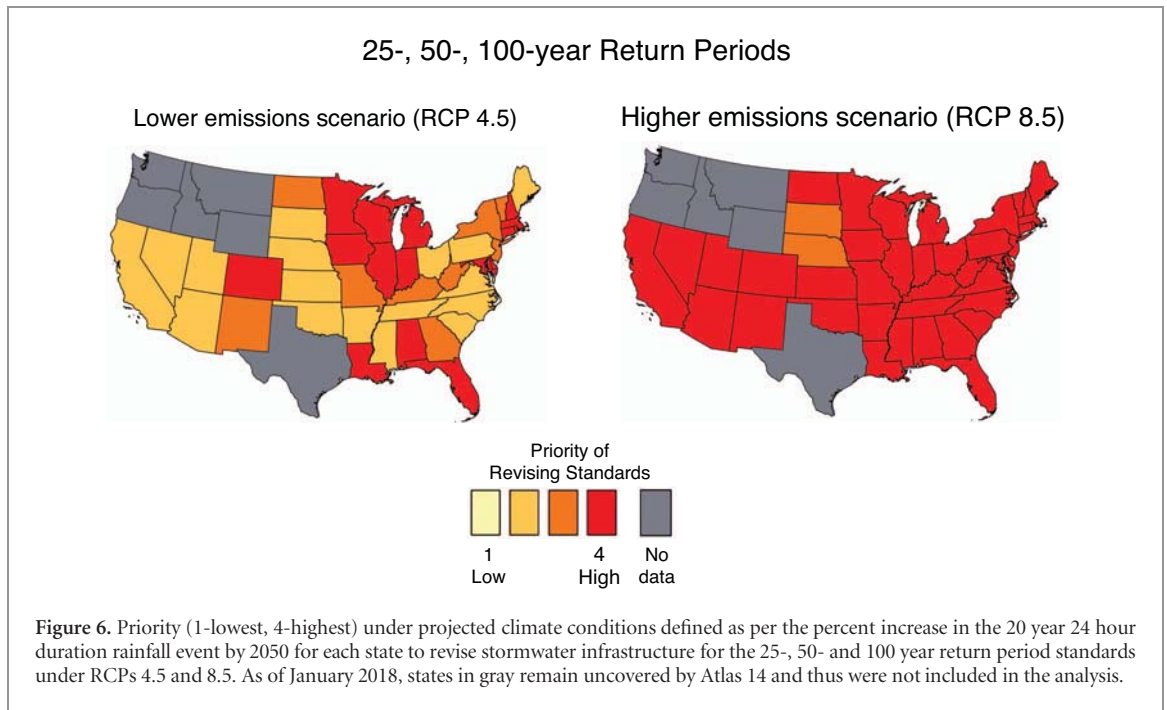
The National Climate Assessment projected a range of 21st century regional percent increases in daily precipitation depths for the 20 year return period for RCP 4.5 and RCP 8.5, relative to the period of 1986–2005 (Easterling *et al* 2017). For 2050, the National Climate Assessment projects greater than a 10% increase in all regions under RCP 8.5, and greater than an 8% increase in all regions under RCP 4.5. Because the National Climate Assessments projects an increase for all states, the priority class to revise stormwater standards for future climate change would increase across all states. Figure 6 shows the priority to revise standards for each state under projected climate conditions. We recommend that states in the top two priority classes (3 and 4) should assess areas to increase preparedness of stormwater infrastructure to projected changes in precipitation patterns. This

implies that much of the infrastructure built under minimum standards specified as of today will be stressed beyond their design capacity in 2050 and will likely not provide the minimum level of protection implied by the original design standard.

## 5. Conclusions

We identified changes in precipitation depth estimates between older and more recent standardized precipitation frequency documents used for infrastructure design in the US, characterized the spatial variability of stormwater design standards across the US, and identified which states need to prioritize a revision of their State DOT stormwater standards in order to increase stormwater resilience to observed and projected impacts from climate change. Eight states were found to have the highest priority for revising stormwater standards for a single or more return period. As future percent increases for the 20 year return period precipitation is projected to be between 8% and 10% under a lower emissions scenario, and greater or equal than 10% across the entire US for a high emissions scenario by 2050 (Easterling *et al* 2017), the number of states classified in higher priority levels increases. Furthermore, these changes are expected to accelerate in the late-century, with a projected percent increase greater or equal to 10% across





all the US under a lower emissions scenario, and greater or equal to 16%, reaching 22% increase for the northeastern US under a high emissions scenario. While there is uncertainty in these estimates, prudent infrastructure planning for long-lived assets requires planning for resilience under uncertainty. Given that the infrastructure expected level of service is deteriorated when the percent change in a return period exceeds 10% (Niemczynowicz 1989), under the conditions projected by future scenarios, infrastructure constructed using existing and historical standards will likely not cope with such changes, especially in those states we identified to have high priority under present conditions.

Updating stormwater standards to account for current and potential future precipitation increases represents a governance challenge for states—existing stakeholders are likely to value lower initial costs of less stringent standards versus reducing life cycle costs and risks for future stakeholders. We recommend regularly revising standards and explicitly considering the potential climate change impacts that infrastructure might experience throughout its lifetime as additional precipitation observations and ranges of climate projections are generated. At the same time, the US Federal government should consider encouraging the systematic, periodic review and updating of stormwater standards across states. These policy mechanisms could be in the form of resilience grants, incentives, minimum requirements for federal funding, or by supporting localized analyses to encourage a more synchronized approach across climate regions. The advantages of such an approach include alignment of local incentives to increasing life cycle regional resilience, while the disadvantages

include potential higher capital costs and challenges of choosing threshold values from a range of climate projections.

Many areas follow similar stormwater infrastructure design practices as US states, for example in Australia (AUS-SPEC 2013). Other areas such as the Government of Hong Kong (2018), the United Kingdom (2016) and New York City in the US (2017) recommend increasing rainfall values by specified percentages to account for future climate change. While local economic and risk assessments comparing costs of increasing the design return period versus the expected costs of future damages related to local exposure and vulnerabilities to infrastructure system failure under climate change remain necessary, a no-regret solution is the revision of stormwater engineering standards to incorporate observed precipitation increases. Having frequently updated precipitation information and design standards, coupled with an understanding of the range of future increases, will enable stakeholders to enhance the resilience of stormwater infrastructure for a changing climate.

### Acknowledgments

This research was partially supported by the National Science Foundation (NSF Collaborative Award Number CMMI 1635638/1635686). Student support was also provided by Consejo Nacional de Ciencia y Tecnología (CONACYT). We are grateful to Mitchell J Small for guidance and useful discussions, and to Lauren M Cook and three anonymous reviewers whose comments significantly improved this manuscript.



## ORCID iDs

Tania Lopez-Cantu  <https://orcid.org/0000-0002-9074-7057>

Constantine Samaras  <https://orcid.org/0000-0002-8803-2845>

## References

- AASHTO 2014 *Drainage Manual* vol 1 (Washington, DC: American Association of State Highway and Transportation Officials)
- Arisz H and Burrell B C 2006 Urban Drainage Infrastructure Planning and Design Considering Climate Change 2006 *IEEE EIC Climate Change Conference* 2006 IEEE EIC Climate Change Conference pp 1–9
- Arizona 2012 Roadway design guidelines. Arizona Department of Transportation, DOC 31-089 ([www.azdot.gov/docs/default-source/business/roadway-design-guidelines.pdf?sfvrsn=8](http://www.azdot.gov/docs/default-source/business/roadway-design-guidelines.pdf?sfvrsn=8))
- Arnbjerg-Nielsen K, Willems P, Olsson J, Beecham S, Pathirana A, Gregersen I B, Madsen H and V-T-V N guyen 2013 Impacts of climate change on rainfall extremes and urban drainage systems: a review *Water Sci. Technol.* **68** 16–28
- ASCE 2017 *Standard Guidelines for the Design of Urban Stormwater Systems* (Reston, VA: American Society of Civil Engineers)
- AUS-SPEC 2013 *Handbook of Stormwater Drainage Design* (Northern Rivers: Northern Rivers Local Government)
- Barros A P, Hodes J L and Arulraj M 2017 Decadal climate variability and the spatial organization of deep hydrological drought *Environ. Res. Lett.* **12** 104005
- Barros Ana P and Evans Jenni L 1997 Designing for climate variability *J. Prof. Issues Eng. Educ. Pract.* **123** 62–5
- Birch C P D, Oom S P and Beecham J A 2007 Rectangular and hexagonal grids used for observation, experiment and simulation in ecology *Ecol. Model.* **206** 347–59
- Bonnin G M, Martin D, Lin B, Parzybok T, Yekta M and Riley D 2011 *NOAA Atlas 14: Precipitation-Frequency Atlas of the United States* vol 1 (Maryland: National Weather Service, National Oceanic and Atmospheric Administration)
- Bonnin G M, Martin D, Lin B, Parzybok T, Yekta M and Riley D 2006 *NOAA Atlas 14: Precipitation-Frequency Atlas of the United States* vol 2 (Maryland: National Weather Service, National Oceanic and Atmospheric Administration)
- Brown S A, Schall J D, Morris J L, Doherty C L, Stein S M and Warner J C 2013 *Urban Drainage Design Manual, Hydraulic Engineering Circular 22* (FHWA, US Department of Transportation)
- Cook L M, Anderson C J and Samaras C 2017 Framework for incorporating downscaled climate output into existing engineering methods: application to precipitation frequency curves *J. Infrastruct. Syst.* **23** 04017027
- DeGaetano A T 2009 Time-dependent changes in extreme-precipitation return-period amounts in the continental United States *J. Appl. Meteorol. Climatol.* **48** 2086–99
- Department for Infrastructure 2016 Design of Highway Drainage System. HD 33/16, Volume 4, Section 2, Part 3. United Kingdom
- Easterling D R, Kunkel K E, Wehner M F and Sun L 2016 Detection and attribution of climate extremes in the observed record *Weather Clim. Extrem.* **11** 17–27
- Easterling D R, Kunkel K, Arnold J, Knutson T, Leung L R, Vose R, Waliser D and Wehner M 2017 *Precipitation Change in the United States* (Washington, DC: US Global Change Research Program)
- Emanuel K 2017 Assessing the present and future probability of hurricane harvey's rainfall *Proc. Natl Acad. Sci.* 201716222
- Frederick R H, Myers V A and Auciello E P 1977 *Five- to 60 Minute Precipitation Frequency for the Eastern and Central United States* (Maryland: Matl. Weather Serv.)
- Gibbs M T 2012 Time to re-think engineering design standards in a changing climate: the role of risk-based approaches *J. Risk Res.* **15** 711–6
- Government of Hong Kong 2018 *Stormwater Drainage Manual: Planning, Design and Management*, Government of the Hong Kong Special Administrative Region
- Groisman P Y, Knight R W, Easterling D R, Karl T R, Hegerl G C and Razuvaev V N 2005 Trends in intense precipitation in the climate record *J. Clim.* **18** 1326–50
- Groisman P Y, Knight R W and Karl T R 2001 Heavy precipitation and high streamflow in the contiguous United States: trends in the twentieth century *Bull. Am. Meteorol. Soc. Boston* **82** 219–46
- Guo Y 2006 Updating rainfall IDF relationships to maintain urban drainage design standards *J. Hydrol. Eng.* **11** 506–9
- Hershfield D M 1961 *Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1–100 Years* (Washington, DC: Weather Bureau, US Department of Commerce)
- Hoerling M, Eischeid J, Perlwitz J, Quan X-W, Wolter K and Cheng L 2016 Characterizing recent trends in US heavy precipitation *J. Clim.* **29** 2313–32
- IPCC 2014 Climate change 2013 *The Physical Science Basis: Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press)
- IPCC 2012 *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change* ed C B Field *et al* (Cambridge: Cambridge University Press)
- Janssen E, Wuebbles D J, Kunkel K E, Olsen S C and Goodman A 2014 Observational- and model-based trends and projections of extreme precipitation over the contiguous United States *Earth's Future* **2** 99–113
- Karl T R and Knight R W 1998 Secular trends of precipitation amount, frequency, and intensity in the United States *Bull. Am. Meteorol. Soc.* **79** 231–41
- Karl T R, Knight R W, Easterling D R and Quayle R G 1995 Trends in US climate during the twentieth century *Consequences* **1** 2–12
- Kim Y-H, Min S-K, Zhang X, Zwiers F, Alexander L V, Donat M G and Tung Y-S 2016 Attribution of extreme temperature changes during 1951–2010 *Clim. Dyn.* **46** 1769–82
- Kunkel K E *et al* 2012 Monitoring and understanding trends in extreme storms: state of knowledge *Bull. Am. Meteorol. Soc.* **94** 499–514
- Lehmann J, Coumou D and Frieler K 2015 Increased record-breaking precipitation events under global warming *Clim. Change* **132** 501–15
- Mailhot A and Duchesne S 2010 Design criteria of urban drainage infrastructures under climate change *J. Water Resour. Plan. Manage.* **136** 201–8
- Manocha N and Babovic V 2018 Sequencing infrastructure investments under deep uncertainty using real options analysis *Water* **10** 229
- McCuen R H 2016 *Hydrologic Analysis and Design* (New Jersey: Pearson)
- Meyer M D 2008 *The Implications of Climate Change* (Washington, DC: Transportation Research Board)
- Miller J F, Frederick R H and Tracey B 1973a *NOAA Atlas 2: Precipitation-Frequency Atlas of the Western United States, Idaho* vol 5 (Washington, DC: Weather Bureau, US Department of Commerce)
- Miller J F, Frederick R H and Tracey B 1973b *NOAA Atlas 2: Precipitation-Frequency Atlas of the Western United States, Montana* vol 5 (Washington, DC: Weather Bureau, US Department of Commerce)
- Miller J F, Frederick R H and Tracey B 1973c *NOAA Atlas 2: Precipitation-frequency Atlas of the Western United States, Oregon* vol 10 (Washington, DC: Weather Bureau, US Department of Commerce)

- Miller J F, Frederick R H and Tracey B 1973d *NOAA Atlas 2: Precipitation-Frequency Atlas of the Western United States, Washington* vol 9 (Washington, DC: Weather Bureau, US Department of Commerce)
- Milly P C D, Betancourt J, Falkenmark M, Hirsch R M, Kundzewicz Z W, Lettenmaier D P and Stouffer R J 2008 Stationarity is dead: whither water management? *Science* **319** 573–4
- National Weather Service 2017 Major Hurricane Harvey ([www.weather.gov/crp/hurricane\\_harvey](http://www.weather.gov/crp/hurricane_harvey))
- Niemczynowicz J 1989 Impact of the greenhouse effect on sewerage systems—lund case study *Hydrol. Sci. J.* **34** 651–66
- NOAA 2017 Current NWS Precipitation Frequency (PF) documents ([www.nws.noaa.gov/oh/hdsc/currentpf.htm](http://www.nws.noaa.gov/oh/hdsc/currentpf.htm))
- NOAA 2018 *Hydrometeorological Design Studies Center Quarterly Progress Report* (Maryland: National Weather Service, National Oceanic and Atmospheric Administration)
- NOAA National Centers for Environmental Information 2017 US Billion-Dollar Weather and Climate Disasters ([www.ncdc.noaa.gov/billions/](http://www.ncdc.noaa.gov/billions/))
- NYC 2017 Preliminary Climate Resiliency Guidelines. Mayor's Office of Recovery and Resiliency, City of New York
- Perica S *et al* 2014 *NOAA Atlas 14: Precipitation-Frequency Atlas of the United States* vol 6 (Maryland: National Weather Service, National Oceanic and Atmospheric Administration)
- Perica S, Martin D, Pavlovic S, Roy I, St. Laurent M, Trypaluk C, Unruh D, Yekta M and Bonnin G 2013a *NOAA Atlas 14: Precipitation-Frequency Atlas of the United States* vol 8 (Maryland: National Weather Service, National Oceanic and Atmospheric Administration)
- Perica S, Martin D, Pavlovic S, Roy I, St. Laurent M, Trypaluk C, Unruh D, Yekta M and Bonnin G 2013b *NOAA Atlas 14: Precipitation-Frequency Atlas of the United States* vol 9 (Maryland: National Weather Service, National Oceanic and Atmospheric Administration)
- QGIS Development Team 2017 QGIS Geographic Information System
- Semadeni-Davies A, Hernebring C, Svensson G and Gustafsson L-G 2008 The impacts of climate change and urbanisation on drainage in Helsingborg, Sweden: combined sewer system *J. Hydrol.* **350** 100–13
- Shepard W 2016 Massive floods cost China \$44.7 billion so far this year; 'ruthless' urbanization takes its toll *Forbes* ([www.forbes.com/sites/wadeshepard/2016/07/28/historic-flooding-costs-china-44-7-billion-so-far-this-year-ruthless-urbanization-takes-its-toll/](http://www.forbes.com/sites/wadeshepard/2016/07/28/historic-flooding-costs-china-44-7-billion-so-far-this-year-ruthless-urbanization-takes-its-toll/))
- Testik F Y and Gebremichael M 2013 *Rainfall: State of the Science* (New York: Wiley)
- US Weather Bureau 1953 *Rainfall Intensities for Local Drainage Design in the United States for Durations of 5 to 240 Minutes and 2-, 5- and 10-Year Return Periods, Part I: West of the 115th Meridian* (Washington, DC: Weather Bureau)
- US Weather Bureau 1954 *Rainfall Intensities for Local Drainage Design in the United States for Durations of 5 to 240 Minutes and 2-, 5- and 10-Year Return Periods. Part II: Between 105-W and 115-W* (Washington, DC: Weather Bureau)
- US Weather Bureau 1955 *Rainfall Intensity-Duration-Frequency Curves for Selected Stations in the United States, Alaska, Hawaiian Islands, and Puerto Rico* (Washington, DC: Weather Bureau)
- US Weather Bureau 1956 *Rainfall Intensities for Local Drainage Design in Western United States, for Durations of 20 Minutes to 24 Hours and 1- to 100-Year Return Periods* (Washington, DC: Weather Bureau)
- US Weather Bureau 1957 *Rainfall Intensity-Frequency Regime. Part I: The Ohio Valley* (Washington, DC: Weather Bureau)
- US Weather Bureau 1958a *Rainfall Intensity-Frequency Regime. Part II: Southeastern United States* (Washington, DC: Weather Bureau)
- US Weather Bureau 1958b *Rainfall Intensity-Frequency Regime. Part III: The Middle Atlantic Region* (Washington, DC: Weather Bureau)
- US Weather Bureau 1959 *Rainfall Intensity-Frequency Regime. Part IV: Northeastern United States* (Washington, DC: Weather Bureau)
- US Weather Bureau 1960 *Rainfall Intensity-Frequency Regime. Part V: Great Lakes Region* (Washington, DC: Weather Bureau)
- Wark N, Smith K, Widing S, San Antonio J and Wildey R 2015 *Hydraulics Manual* (Montpelier, VT: Vermont Agency of Transportation)
- Wenzel Harry G 2013 Rainfall for urban stormwater design *Urban Stormwater Hydrology Water Resources Monograph* vol 7 (Washington, DC: American Geophysical Union)
- Wilby R L and Wigley T M L 2002 Future changes in the distribution of daily precipitation totals across North America *Geophys. Res. Lett.* **29** 39–1
- Willems P, Arnbjerg-Nielsen K, Olsson J and Nguyen V T V 2012 Climate change impact assessment on urban rainfall extremes and urban drainage: methods and shortcomings *Atmos. Res.* **103** 106–18
- Wu S-Y 2015 Changing characteristics of precipitation for the contiguous United States *Clim. Change* **132** 677–92
- Wuebbles D *et al* 2013 CMIP5 climate model analyses: climate extremes in the United States *Bull. Am. Meteorol. Soc.* **95** 571–83
- Yarnell D L 1935 *Rainfall Intensity-Frequency Data* (Washington, DC: US Department of Agriculture)
- Zhou Q, Mikkelsen P S, Halsnæs K and Arnbjerg-Nielsen K 2012 Framework for economic pluvial flood risk assessment considering climate change effects and adaptation benefits *J. Hydrol.* **414–15** 539–49

**AN ORDINANCE TO AMEND THE TOWN OF CARRBORO'S LAND USE  
ORDINANCE RELATING TO THE VOLUME CONTROL PROVISIONS**

**\*\*DRAFT 4-11-2019\*\***

BE IT HEREBY ORDAINED BY THE CARRBORO BOARD OF ALDERMEN THE  
FOLLOWING:

**Section 1.** Subsection 15-263, of the Carrboro Land Use Ordinance, Management of  
Stormwater, (g)(3) is rewritten to read as follows:

(3) The Board finds that increases in the total annual volume of runoff associated with new development results in decreased groundwater recharge, increased stream channel instability/erosion and significant water quality degradation. Therefore to the maximum extent practicable developments shall install and maintain stormwater management systems such that the post-development total annual stormwater runoff volume shall not exceed the predevelopment volume by more than the limits set forth in the table below. The predevelopment and post-development annual stormwater runoff volume shall be calculated using the most up to date guidance and accounting methodology from North Carolina environmental regulatory agencies with stormwater management oversight.

**Section 2.** All provisions of any Town ordinance or resolution in conflict with this ordinance are repealed.

**Section 3.** This ordinance is effective upon adoption.

## ARTICLE XVI

### FLOOD DAMAGE PREVENTION, STORMWATER MANAGEMENT, AND WATERSHED PROTECTION

#### PART II. STORM WATER MANAGEMENT

**Section 15-263 Management of Stormwater (REWRITTEN 6/26/07; AMENDED 6/24/08; AMENDED 10/28/08; 6/22/10; 11/23/10; REWRITTEN 6/26/12)**

(g) Developments shall be constructed and maintained so that their stormwater management systems meet the following minimum standards:

(1) The post-development discharge rates shall be less than or equal to the pre-development discharge rates for the 1-, 2-, 5-, 10-, and 25-year 24-hour design storms.

(1) For upstream properties, the 1% chance flood elevation may not be increased.

(2) The Board finds that increases in the total annual volume of runoff associated with new development results in decreased groundwater recharge, increased stream channel instability/erosion and significant water quality degradation. Therefore **to the maximum extent practicable** developments shall install and maintain stormwater management systems such that the post-development total annual stormwater runoff volume shall not exceed the predevelopment volume by more than the limits set forth in the table below. The predevelopment and post-development annual stormwater runoff volume shall be calculated using the most up to date guidance and accounting methodology from North Carolina environmental regulatory agencies with stormwater management oversight.. (AMENDED 6/26/12) (AMENDED 2/26/13)



A composite curve number shall be assigned to the development site in the pre-development stage using the runoff curve number method described in USDA NRCS Technical Release 55, Urban Hydrology for Small Watersheds (June, 1986). See also Chapters 4 through 10 of NEH-4, SCS (1985).



*Art. XVI. FLOOD DAMAGE PREVENTION, STORMWATER MANAGEMENT, AND WATERSHED PROTECTION*

<b>Preexisting Composite Curve Number*</b>	<b>Maximum allowable increase in annual stormwater runoff volume</b>
> 78	50%
>70-78	100%
> 64-70	200%
<=64	400%

**(AMENDED 2/26/13)**