

## COMMITTEE OF THE WHOLE MEETING

October 20, 2020

7:45 P.M.

In light of the current COVID-19 public health emergency, Governor J.B. Pritzker's Gubernatorial Disaster Proclamation, and the Village's Continuation of Proclamation of Local Disaster Emergency in response thereto, the Village President has determined that an entirely in-person meeting is not practical or prudent because of the disaster. This meeting will be held remotely and in-person, but there will be a limit of twelve (12) in-person seats available for the public in the Village Board Room, 2200 Harnish Drive, Algonquin. The following information is being made available to the public for the purpose of public participation in the spirit of transparency and an open meeting process.

The complete Committee of the Whole packet is posted at the Algonquin Village Hall and may be viewed online via the Village Board's link on the Village's website, [www.algonquin.org](http://www.algonquin.org). If you would like to listen to the meeting or comment during the meeting, please go to <https://algonquin.zoom.us/j/96112240458> or dial in (312)626-6799, (877)853-5257, or (888)475-4499 webinar ID **961 1224 0458**. If you wish to submit any public comment, please contact the Deputy Village Clerk in advance of the meeting at 847-658-5609 or [meetingcomments@algonquin.org](mailto:meetingcomments@algonquin.org) or during the to comment during the meeting public comment portion of the meeting after logging into the zoom meeting, please raise your hand and you will be called on, if you are dialing in, dial \*9 to raise your hand. The Village will attempt to read such public comments during the public commentary portion of the meeting. Any comments received during the meeting but after the public commentary portion has ended will be provided in writing to the Village Board members after the meeting.

Remote meetings will be recorded for the purpose of accurate meeting minute

Trustee Steigert – Chairperson

Trustee Jasper

Trustee Brehmer

Trustee Glogowski

Trustee Spella

Acting President Sosine

- AGENDA -

1. **Roll Call – Establish Quorum**
2. **Public Comment – Audience Participation**  
*(Persons wishing to address the Committee for virtual attendance, see above. If attending in person, please register with the Acting Village President prior to the meeting.)*
3. **Community Development**
  - A. Consider a Seasonal Special Event Permit for the Lions Club Christmas Tree Sale. The setup would begin on November 21, with sale dates from November 27<sup>th</sup> through December 23, and cleanup thereafter
  - B. Consider an Amendment to Chapter 23, Building Codes and Appendix B, Penalty, Salary, Bonds, and Fees
  - C. Consider the Riverview Townhomes Proposal
4. **General Administration**
5. **Public Works & Safety**
  - A. Consider an Agreement with B&B Holiday Decorating of Des Plaines for the Holiday Lighting in Old Town
  - B. Consider an Agreement with EEI for the Risk and Resilience Assessment
6. **Executive Session**
7. **Other Business**
8. **Adjournment**



**VILLAGE OF ALGONQUIN**  
*COMMUNITY DEVELOPMENT DEPARTMENT*

**– M E M O R A N D U M –**

DATE: October 15, 2020

TO: Committee of the Whole

FROM: Russell Farnum, AICP, Community Development Director

SUBJECT: *2020 Seasonal Event – Lions Christmas Tree Sales Lot*

---

The Algonquin Lions Club has petitioned for their annual Seasonal Event Permit to hold Christmas Tree Sales at the Algonquin State Bank lot at the corner of Huntington and Randall Road. The setup would begin on November 21, with sale dates from November 27<sup>th</sup> through December 23, and cleanup thereafter.

The Lions Club is requesting that the fee be waived, as they are a not-for-profit organization. The fee is \$50 per day and, if charged, would be over \$1,500. The Village Board has traditionally granted their fee waiver request.

In addition, the past couple of years they have added fires in “burn barrels” for the warmth of their volunteers and the ambience of the holiday season. Staff has closely monitored this with the input from the Fire Department. Staff recommends approval of the fires subject to the following conditions:

1. Burn only natural dry seasoned wood, no tree scraps or greenery;
2. Keep fires and barrels at least six feet away from all combustibles;
3. At least one fire extinguisher must be present at all times;
4. All fires are subject to the approval of the Fire Chief and are allowed only in compliance with Chapter 43.08 of the Algonquin Municipal Code, except for Paragraph A2 (which restricts fires to residential districts);
5. The Village or the Fire Department may order the fires extinguished if the fires become unsafe or if there are complaints about smoke or odors
6. Face masks shall be worn by customers and volunteers at all times when social distancing is not possible, and other safe practices necessary for compliance with the appropriate phase of Recover Illinois shall be followed at all times.

Consensus to forward this to the Village Board for approval with the considerations outlined above is recommended.



**VILLAGE OF ALGONQUIN**  
*COMMUNITY DEVELOPMENT DEPARTMENT*

**– M E M O R A N D U M –**

DATE: October 15, 2020

TO: Committee of the Whole

FROM: Craig Arps, Building Commissioner

SUBJECT: *Chapter 23 Building Codes Ordinance Update*

---

Background

Over the course of the past several months Village staff have been reviewing, updating and revising all of Chapter 23. As you know, Chapter 23 adopts and amends all the Building Codes enforced by the Village. Currently, Chapter 23 references the 2006 edition of the International Codes (I-Codes). Staff felt it was time for another review based on changes in construction technology, methods and materials. Staff recommends the adoption of the 2018 edition of the International Buildings Codes as well as the 2014 edition of the Illinois State Plumbing Code and the 2017 edition of the National Electrical Code.

There are numerous benefits to updating the adopted Codes. Not only do newer Codes take in account new construction technology, methods and materials, design professionals and contractors are more acquainted with more recent Codes. Furthermore, adopting the 2018 I-Codes would provide some consistency with other communities in the area, making it easier for design professionals and contractors to work in the area. Crystal Lake has already adopted the 2018 I-Codes. Lake in the Hills is in the process of reviewing the 2018 I-Codes for adoption. Huntley and Carpentersville are considering the adoption of the 2018 I-Codes.

Additionally, Permit fees have not been updated since the adoption of the 2006 I-Codes. Consequently, staff felt it was also time to update the Permit Fee Schedule in Appendix B. The recommended changes to Permit Fee Schedule reflect a modest increase in Permit fees to help offset the cost of reviewing Permits for Code compliance, processing Permits and conducting inspections. Attached is the proposed Chapter 23 and a Permit Fee Schedule.

## Changes

The changes proposed to Chapter 23 include the adoption of the following Codes, with local amendments:

- 23.02 International Residential Code/2018
- 23.03 Modifications to the Residential Code
- 23.04 International Building Code/2018
- 23.05 Modifications to the Building Code
- 23.06 International Fire Code/2018
- 23.07 Modifications to the Fire Code
- 23.08 International Mechanical Code/2018
- 23.09 Modifications to the Mechanical Code
- 23.10 International Fuel Gas Code/2018
- 23.11 Modifications to the Fuel Gas Code
- 23.12 National Electrical Code/2017
- 23.13 Modifications to the Electrical Code
- 23.14 Illinois State Plumbing Code/2014
- 23.15 International Energy Conservation Code/2018
- 23.16 Modifications to the Energy Conservation Code
- 23.17 International Existing Building Code/2018
- 23.18 Modification to the Existing Building Code
- 23.19 International Property Maintenance Code/2018
- 23.20 Modifications to the Property Maintenance Code
- 23.21 Illinois Accessibility Code/2018
- 23.22 International Swimming Pool and Spa Code/2018
- 23.23 Modifications to Swimming Pool and Spa Code

The most significant changes between the 2006 and the 2018 I-Codes can be found in the International Residential Code (IRC). The 2018 edition of the IRC requires a fire sprinkler system to be installed in new one and two-family attached dwellings. Residential fire sprinkler systems have been a requirement in the model codes since the 2012 I-Code series, and have received a lot of pushback from professionals in the industry. Since that time, the IRC text has evolved to provide alternatives to the fire sprinkler requirement.

To that result, staff is recommending that the IRC Code Sections requiring a fire sprinkler system in new single family detached houses be amended out of the Code. As a result, a new single-family house would not need to be sprinkled. A Two-family attached dwelling (duplex) would still need to be sprinkled. Staff is comfortable eliminating the sprinkler requirement because of the approved fire-resistant construction methods for houses that do not have a fire sprinkler system. For example, if a house is not sprinkled, the basement side of engineered floor joists (TJI & truss) will have to be covered with sheetrock.



Other changes in the IRC are specific to exterior deck construction. For example, the minimum concrete pier diameter would be increased to 12” from 8” and the manner in which the ledger is mechanically attached to the house is more restrictive.

The proposed revisions to Chapter 23 include significantly limiting the number of amendments to the Illinois State Plumbing Code (ISPC). The reason is that the 2014 edition of the (ISPC) recently published by the Illinois Department of Public Health, specifies that local municipalities shall not amend the Plumbing Code. As a result, a plumber is now allowed to use CPVC or PEX pipe for potable water distribution rather than strictly copper.

Another change between the 2006 and 2018 I-Codes can be found in the International Energy Conservation Code (ECC). For example, the 2018 edition of the ECC specifies additional insulation and more efficient heating and cooling equipment be installed in buildings.

The Village of Algonquin Electrical Commission met on multiple occasions to discuss the adoption of the 2017 edition of the National Electrical Code (NEC). The Electrical Commission have unanimously recommended the proposed update with amendments to the NEC.

### Updates to Appendix B

Most of the fees listed in the Permit Fee Schedule with in Appendix B of the Municipal Code are proposed to be increased. The increase of fees will help to compensate for the amount of inflation experienced since the last time the Permit Fee Schedule was updated and help to cover the cost of conducting inspections. Additionally, in an effort to provide better service to residents, the Community Development Department recently started accepting credit cards for Permit fee payment. The increase in Permit fees will also help to offset the cost of accepting credit cards.

The Proposed updates to the Permit Fee Schedule include increasing the minimum Permit fee amount for a residential improvement to \$45.00 from \$40.00 and increasing the minimum non-residential (commercial) improvement to 85.00 from \$75.00. The Permit fee to replace a water heater is proposed to remain the same, at \$10.00

Additionally, an option to calculate a Permit fee pursuant to area of construction (square footage) rather than strictly by construction cost is proposed.

With the proposed Permit fee increase, the Village of Algonquin’s Permit fees will be consistent with surrounding communities or in many instances, will be less than other communities.

### Recommendation

Consensus to move the updates to Chapter 23 and Appendix B of the Village of Algonquin Municipal Code forward to the Board for approval is recommended.

Chapter 23  
**BUILDING CODES**

- 23.01 Definitions
- 23.02 International Residential Code/2018 Adopted
- 23.03 Modifications to the Residential Code
- 23.04 International Building Code/2018 Adopted
- 23.05 Modifications to the Building Code
- 23.06 International Fire Code/2018 Adopted
- 23.07 Modifications to the Fire Code
- 23.08 International Mechanical Code/2018 Adopted
- 23.09 Modifications to the Mechanical Code
- 23.10 International Fuel Gas Code/2018 Adopted
- 23.11 Modifications to the Fuel Gas Code
- 23.12 National Electrical Code/2017 Adopted
- 23.13 Modifications to the Electrical Code
- 23.14 Illinois State Plumbing Code/2014 Adopted
- 23.15 International Energy Conservation Code/2018 Adopted
- 23.16 Modifications to the Energy Conservation Code
- 23.17 International Existing Building Code/2018 Adopted
- 23.18 Modification to the Existing Building Code
- 23.19 International Property Maintenance Code/2018 Adopted
- 23.20 Modifications to the Property Maintenance Code
- 23.21 Illinois Accessibility Code/2018 Adopted
- 23.22 International Swimming Pool and Spa Code/2018
- 23.23 Modifications to Swimming Pool and Spa Code
- 23.24 Permit Fee Schedule
- 23.25 Kane County Road Improvement Impact Fee
- 23.26 Identification of Local Building Code Not Adopted

**23.01 DEFINITIONS**

In addition to those terms defined in Appendix A of this Code, for purposes of this Chapter, any reference to Code Official and Building Official shall mean the Building Commissioner; any reference to a specific chapter, other than Chapter, shall mean the applicable chapter in the applicable building code; and any reference to a code, other than Code, shall mean that particular building code of that section.

**23.02 INTERNATIONAL RESIDENTIAL CODE/2018**

The International Residential Code, 2018 edition, and appendices B, C, D, F, J and K (“Residential Code”), are hereby adopted by reference and made part of this Section, subject to modifications set forth herein, and shall be applicable to the Village.

**23.03 MODIFICATIONS TO THE RESIDENTIAL CODE**

The Residential Code shall be amended as follows:

1. Section R101.1 insert Village of Algonquin.

2. Section R105.1 shall be amended to read as follows:

**R105.1 Required.** Any owner or authorized agent who intends to construct, enlarge, alter, replace, repair, including the installation of roof coverings, siding, patios, decks, gazebos, porches, detached accessory buildings or structures, sidewalk, driveways, fences, and swimming pools; retaining walls; use of a shipping container for temporary storage, if on site for more than 14 consecutive days and in no case shall the shipping container be on site for more than 90 consecutive days; move, demolish, or change the occupancy of a building or structure; install or replace any electrical gas, mechanical, or plumbing system, the installation of which is regulated by this Code, or to cause any such work to be done, shall first make application to the Building Official and obtain the required permit(s).

3. Section R105.2 shall be amended to read as follows:

**R105.2 Work exempt from permit.** Permits shall not be required for the following. Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinance of the Village.

Building:

1. Prefabricated swimming pools that are not capable of holding 24 inches (610 mm) or more of water.
2. Retaining walls that are not over two feet (610 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge.
3. Painting, papering, tiling, carpeting, countertops, and similar finish work.
4. Swings and other playground equipment accessory to a one- or two-family dwelling.
5. Prefabricated storage containers less than 100 cubic feet in volume, accessory to a one- or two-family dwelling, located in the rear yard and outside any easements.

Electrical: No change.

Gas: No change.

Mechanical: No change.

4. Section R105.2.2 Insert new Sections:

**R105.2.2.1 Fence Repair.** The repair or replacement of up to two (2) fence panel sections and/or three (3) support posts.

**R105.2.2.2 Siding and Roof Repair.** The repair or replacement of up to an aggregate total of 200 square feet of roofing material or siding material.

5. Section R105.5 shall be amended to add:

The work authorized by permit shall be completed and a final inspection conducted within 180 days after its issuance.

Exceptions: The following work authorized by permit shall be completed and a final inspection conducted within one year after its issuance.

1. Single-family dwellings
2. Two-family dwellings
3. Townhouse dwellings
4. Dwelling unit additions and/or alterations

6. Section R106.1 shall be amended to read as follows:

**R106.1 Submittal documents.** Construction documents for new single-family dwellings, two-family dwellings, townhouse dwellings, duplex dwellings, additions to dwelling units above the first floor, modifications which alter existing bearing walls or beams, modifications which alter the existing roof of a dwelling unit, retaining walls that are five (5) feet in height or taller measured from the footing to the top of the wall, unless supporting a surcharge and alterations, repairs, expansion, additions, and/or modifications to a dwelling unit of a substantial scope as determined by the Building Official shall be sealed and signed by an Illinois licensed architect or structural engineer.

7. Section R106.2 shall be amended to read as follows:

**R106.2 Site plan.** The construction documents submitted with the permit application shall be accompanied by a plat of survey prepared by an Illinois licensed professional engineer or land surveyor showing the size and location of new construction, existing structures, any floodplain or wetland areas, and easements on the site and distances from lot lines. A plat of survey submitted for the construction of a new single-family, two-family, duplex, or townhouse dwelling shall specify the top of foundation elevation proposed for the building based on the approved engineering plan for the subdivision in which the building will be located. In the event there is not an approved engineering plan for the subdivision in which the building will be located, the proposed top of foundation elevation shall be determined using best engineering practices.

8. Section R106.2.1 shall be amended to add the following:

**R106.2.1 As-built plan.** An as-built survey prepared by an Illinois licensed professional engineer or land surveyor shall be completed after the foundation for a single-family dwelling, two-family dwelling, duplex, or townhouse dwelling has been placed and submitted to the Village for review and approval. The as-built survey shall show the location of the foundation, distances from property lines, the proposed top of foundation elevation, and the actual top of foundation elevation. Construction past the first floor deck shall not continue until the as-built survey has been reviewed and approved by the Building Official.

9. Add a new Section R106.2.2, which shall read as follows:

**R106.2.2 Final as-built & grading plan.** A final as-built survey and grading plan prepared by an Illinois licensed professional engineer or land surveyor shall be completed after the construction of a single-family, two-family, duplex, or townhouse dwelling has been completed. The survey shall be submitted to the Village for review and approval prior to the issuance of a Certificate of Occupancy. The final as-built and grading plan shall indicate the location of all construction, site improvements, and final grading on the lot.

10. Section R112 shall be amended to read as follows:

**112.1 General.** In order to hear and decide appeals of orders, decisions, or determinations made by the Building Official relative to the application and interpretation of this code, an appeal may be made to the Village Board.

11. New Section R115 shall be added, to read as follows:

### **R115 SITE REQUIREMENTS**

**R115.1 Construction site access.** Access to construction sites and lots shall be by means of a paved roadway(s) capable of supporting a vehicle weighing at least 85,000 pounds.

**R115.2 Street identification.** All streets and roadways leading to construction site(s) shall be identified by their name, on signs clearly visible from the right-of-way with characters not less than three inches in height.

**R115.3 Lot identification.** All construction sites and lots shall be identified by their address, on signs clearly visible from the right-of-way with numbers and letters not less than three inches in height. Once a structure is in place, the address shall be applied legibly to the portion of the structure that faces the right-of-way and remain in place throughout the construction process.

**R115.4 Roadway maintenance.** All roadways, streets, sidewalks, and bike paths shall remain free of mud/dirt and debris at all time.

**R115.5 Construction driveways.** The designated areas for driveways shall, at a minimum, be gravel or crushed stone from the back of the curb or end of the paved right-of-way up to the structure.

**R115.6 Sanitation facilities.** Approved portable sanitation facilities in sufficient quantities shall be provided and maintained on construction sites and located within 200 feet of construction activity.

12. Section R202: The following definition shall be added:

**DUPLEX (TWO-FAMILY DWELLING).** A building not more than three stories in height, consisting of two attached single-family dwelling units in which each unit extends from foundation to roof. Each unit has a separate means of egress and each unit has open space on three sides.

13. Table R301.2(1), insert the following:

Ground Snow Load	30 pounds per square foot
Wind Speed (three second gust)	115
Topographic effects	No
Special Wind Region	No
Windborne Debris Zone	No
Seismic Design Category	B
Weathering	Severe
Frost Line Depth	42 inches minimum below grade
Termite	Moderate
Winter Design Temperature	-4 degrees Fahrenheit
Ice Barrier Underlayment Required	Yes
Flood Hazards	reference Flood Insurance Rate Map for Algonquin 11/16/2006 & Chapter 44
Air Freezing Index	1745
Mean Annual Temperature	47.8 degrees Fahrenheit
Elevation	700
Latitude	42.251264
Winter Heating	-4 degrees Fahrenheit
Summer Cooling	89 degrees Fahrenheit
Altitude correction factor	0.0
Indoor design temperature	72 degrees Fahrenheit
Heating temperature difference	76 degrees Fahrenheit [72-(-4)]
Cooling temperature difference	14 degrees Fahrenheit [89-75]
Wind velocity heating	8.4 miles per hour
Wind velocity cooling	5.7 miles per hour
Coincident wet bulb	74 degrees Fahrenheit
Daily range	M
Winter humidity	30%
Summer Humidity	50%

14. Table R301.5: Substitute the following line items:

<b>USE</b>	<b>LIVE LOAD</b>
Sleeping rooms	40

15. Table R301.7: Substitute the following line item:

<b>STRUCTURAL MEMBER</b>	<b>ALLOWABLE DEFLECTION</b>
Floors	L/480

16. Section R302.5.1 shall be amended to add the following:

Doors shall have a net clear opening of not less than 34 inches.

17. Section R302.6 shall be amended to read as follows:

**R302.6 Dwelling-garage fire separation.** All garages attached to a dwelling shall have 5/8-inch Type X gypsum board or equivalent applied to all walls and ceilings. Attachment

of gypsum board shall comply with Table R702.3.5.

18. Add a new Section R309.6, which shall read as follows:

**R309.6 Garage exit.** Not less than one exit conforming to Section R311 shall be provided from any attached or detached garage.

19. Section R311.2 shall be amended to read as follows:

**R311.2 Egress door.** Not less than two egress doors shall be provided for each dwelling unit. One egress door shall be side-hinged and shall provide a clear width of not less than 32 inches (813 mm) where measured between the face of the door and the stop, with the door open 90 degrees. The clear height of the door opening shall be not less than 78 inches (1981 mm) in height measured from the top of the threshold to the bottom of the stop. The second required egress door may be a sliding type door, with a net clear opening of not less than 32 inches. Other doors shall not be required to comply with these minimum dimensions. Egress doors shall be readily openable from the inside the dwelling without the use of a key or special knowledge or effort.

20. **Section R313.2 One- and two-family dwellings automatic fire sprinkler systems.** Shall be deleted in its entirety.

21. Section R401 shall be amended to read as follows:

**R401.4.** A soil test shall be conducted to determine the soil's characteristics in the ultimate bearing strata prior to the placement of footings for all one-family, duplex, two-family, and townhouse dwellings. Additionally, in areas likely to have expansive, compressive, shifting, or other unknown soil characteristics, a soil test shall be conducted prior to the placement of footings for additions to dwellings or detached accessory structures. These tests shall be made by an approved agency using an approved method. A copy of the soil report shall be submitted to the Community Development Department prior to the approval of the footing inspection.

22. Chapter 4: All references to wood foundations and rubble stone masonry foundations shall be deleted.

23. Section 403.1 shall be amended to read as follows:

**R403.1 General.** All exterior walls for one-family, duplex, two-family, and townhouse dwellings and additions to dwelling units shall be supported in their entirety on a continuous concrete spread footing and foundation of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill. Concrete footing shall be designed and constructed in accordance with the provisions of Section R403 or in accordance with ACI 332. Any structure attached to a dwelling unit containing any glazing including but not limited to glass, Lexan, Plexiglas, plastic, or other similar material shall be considered an addition and shall conform to the requirements of this Chapter.

## Exceptions:

1. Exterior walls for one-family, duplex, two-family, and townhouse dwellings, additions to dwelling units, and dwelling unit separation wall assemblies may be supported in their entirety on a continuous concrete bank poured (trench) foundation not less than 16 inches in width, with the base of the foundation placed at or below the frost line.
  2. Single-story additions to a dwelling unit with a total area of 400 square feet or less may be supported by a continuous concrete bank poured (trench) foundation not less than 12 inches in width, with the base of the foundation placed at or below the frost line with 24-inch #5 reinforcing bars doweled six inches into the existing foundation, 12 inches on center vertically, where the foundation for the addition abuts the existing foundation.
  3. Exterior stairs having three or more risers shall have stringers pressure treated to prevent decay and shall be supported by solid concrete piers not less than eight inches in diameter with the base of the pier placed at or below the frost line.
24. Section R403.1.1, Minimum size, shall be amended to add the following:
- In no case shall the footing size be less than 16 inches in width and less than eight inches in thickness.
25. Section R404.1.3, Concrete foundation walls, shall be amended to add the following:
- All foundation walls with a basement shall have not less than two continuous #4 reinforcing bars tied in place within 12 inches of the top and bottom of the wall and no splices shall be made within 18 inches of a corner.
26. Section R404.1.5 shall be amended to add the following:
- In no case shall the foundation wall thickness be less than eight inches.
27. Section 405.2.3, Drainage system, shall be amended to add the following:
- All basement window wells shall be provided with drainage consisting of a vertical drain pipe connected to the foundation drainage system with an approved "T"-type connector.
28. Section R407.3, Structural requirements, shall be amended to add the following:
- The amount of exposed loose shims used to support a column or girder shall not exceed one inch in height.
29. Section R408.6, Finish grade, shall be amended to add the following:
- The under-floor grade within a crawl space shall be covered with an approved vapor barrier and a slush-coat of concrete not less than two inches thick.



30. Section R502.3.1 shall be amended to read as follows and delete Table R502.3.1(1):
31. **R502.3.1 Sleeping areas and attic joists.** Table R502.3.1(2) shall be used to determine the maximum allowable span of floor joists that support sleeping areas and attics that are accessed by means of a fixed stairway in accordance with Section R311.5, provided that the design live load does not exceed 40 psf and the design dead load does not exceed 20 psf. The allowable span of ceiling joists that support attics used for limited or no storage shall be determined in accordance with Section R802.5.
32. **Section R504 Pressure Preservative-Treated Wood Floors (On Ground)** Shall be deleted in its entirety.
33. Section R506.2.2 shall be amended to read as follows and add Section R506.2.2.1:
- R506.2.2 Base.** A base course not less than four inches thick consisting of a compactible gravel aggregate, such as CA-6 or equivalent, shall be placed on the prepared sub-grade of any slab on grade, not confined on all edges by a footing, foundation, or other permanent structure, and compacted to not less than 95 percent modified proctor density. Any slab on grade confined on all edges may use a four-inch minimum base course of clean graded sand, gravel, crushed stone, or washed stone.
34. **R506.2.2.1 Slab reinforcement.** Two continuous #4 reinforcing bars shall be placed mid-slab the entire length of all service walks and doweled six inches into abutting stoops. Two continuous #4 reinforcing bars shall be placed mid-slab in any portion of a public walk which crosses over a backfilled excavation. Six-inch by six-inch #10 welded wire fabric shall be placed in the top one-third of all basement slabs, garage slabs, concrete driveways, and concrete patios with more than 100 square feet of total area. Fiber reinforced concrete, with fiber content of not less than 1.5 pounds per cubic yard (0.9 kg per cubic meter) of concrete may be used in place of welded wire fabric.
35. Section R506.2.3, Vapor retarder, Exception 1, shall be amended to read as follows:
- Exception:** 1. From detached garages, detached utility buildings, and other detached unheated accessory structures.
36. Section R507.3 shall be amended to read as follows:
- Section 507.3 Piers.** Decks shall be supported on top of concrete piers. Deck piers shall be sized to carry the imposed loads from the deck structure to the ground. The base of the concrete pier shall be at a depth in accordance with Section R403.1.4.  
Delete Figure R507.3 Deck Posts to Deck Footing Connection.  
Delete Exception.
37. Section R507.3.1 shall be amended to read as follows:

**R507.3.1 Minimum size.** The minimum size of a concrete pier shall be not less than 12 inches (305 mm) in diameter.

Delete Table R401.4.1 Minimum Footing size for Decks.

38. Section R507.3.2. Delete Exceptions

39. Table R507.4 Deck Post Height. Replace maximum heights with the following:

<b>Deck Post Size</b>	<b>Maximum Height</b>
4 x 4	6 Feet
4 x 6	8 Feet
6 x6	10 Feet
8 x8	14 Feet

40. Section R507.4.1 shall be amended to read as follows:

**R507.4.1 Deck post to deck pier connection.** Deck posts shall bear on the center of the concrete piers. The attachment of the deck post to the concrete pier shall be made by approved manufactured connectors to provide lateral and uplift restraint.

Delete Exception.

41. Section R703.1 Exterior covering general, shall be amended to add the following:

Any enclosed, attached, or detached accessory structure constructed of canvas, nylon, plastic, or other pliable material supported by air, cables, tubing, metal, or wood framework shall be prohibited. The provisions of this Section shall not apply to awnings or canopies which provide weather protection or decoration.

42. Section R801.3, Roof drainage, shall be amended to read as follows:

**R801.3 Roof drainage.** All dwellings shall have a controlled method of water disposal from roofs that will collect and discharge all roof drainage to the ground surface at least two feet from foundation walls or to an approved drainage system. Upper roof surfaces shall not be permitted to discharge onto lower roof surfaces. In areas where expansive or collapsible soils are known to exist, all dwellings shall have a controlled method of water disposal from roofs that will collect and discharge drainage to the ground surface at least five feet from foundation walls or to an approved drainage system.

43. The following chapters shall be deleted in their entirety:

- Chapter 25, Plumbing Administration
- Chapter 26, General Plumbing Requirements
- Chapter 27, Plumbing Fixtures
- Chapter 28, Water Heaters
- Chapter 29, Water Supply and Distribution
- Chapter 30, Sanitary Drainage
- Chapter 31, Vents

Chapter 32, Traps  
Chapter 34, Electrical General Requirements  
Chapter 35, Electrical Definitions  
Chapter 36, Services  
Chapter 37, Branch Circuits and Feeder Requirements  
Chapter 38, Wiring Methods  
Chapter 39, Power and Lighting Distribution  
Chapter 40, Devices and Luminaries  
Chapter 41, Appliance Installation  
Chapter 42, Swimming Pools  
Chapter 43, Class2 Remote-Control, Signaling and Power-Limiting Circuits

44. All plumbing installations, materials, and fixtures shall comply with the Illinois Plumbing Code, 2014 edition, promulgated by the Illinois Department of Public Health.
45. All electrical installations, materials, fixtures, and devices shall comply with the National Electrical Code, 2017 edition, promulgated by the National Fire Protection Association, as amended by the Village.

#### 23.04 **INTERNATIONAL BUILDING CODE/2018**

The International Building Code, 2018 edition, (“Building Code”) is hereby adopted by reference and made part of this Section, subject to the modifications set forth herein, and shall be applicable to the Village.

#### 23.05 **MODIFICATIONS TO THE BUILDING CODE**

The Building Code shall be amended as follows:

1. Section [A] 101.1, insert: Village of Algonquin
2. Section [A] 101.4.4 shall be amended to read as follows:

**[A] 101.4.4 Plumbing.** The provisions of the Illinois State Plumbing Code, 2014 edition, shall apply to the installation, alteration, repair, and replacement of plumbing systems, including equipment, appliances, fixtures, fittings, and appurtenances.

3. Section [A] 101.4. Add new Section:

**[A] 104.4.8 Electrical.** The provisions of the National Electrical Code, 2017 edition, promulgated by the National Fire Protection Association, as amended by the Village shall apply to the installation of electrical systems, including alterations, repairs, replacement, equipment, appliances, fixtures, fittings and appurtenances thereto.

4. Section [A] 105.1, Required, shall be amended to read as follows:

**[A] 105.1 Required.** Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure; or to erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical, plumbing, or fire protection system; the installation of communication towers or antennas; the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the Building Official and obtain the required permit.

5. Section [A] 107.3, Examination of documents, shall be amended to read as follows:

**[A] 107.3 Examination of documents.** The Building Official shall examine or cause to be examined the accompanying construction documents and fire protection shop drawings and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this Code and other pertinent laws or ordinances. The Building Official is authorized to submit the construction documents and fire protection shop drawings to a third-party plan review agency chosen by the Building Official. The property owner or owner's agent shall be responsible for the reimbursement to the Village of all fees associated with the review of documents by any third-party plan review agency, and all fees shall be paid in full prior to the issuance of the permit.

6. Section [A] 110.4, Inspection agencies, shall be amended to read as follows:

**[A] 110.4 Inspection agencies.** The Building Official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability. The Building Official is authorized to engage a third-party inspection agency for inspections of a technical nature in addition to the inspections required in Section 1704. The property owner or the owner's agent shall be responsible for the reimbursement to the Village of all fees associated with inspections conducted by any third-party inspection agency and shall be paid in full prior to the issuance of a Certificate of Occupancy.

7. Section [A] General, 113.1 shall be amended to read as follows:

**[A] 113.1 General.** In order to hear and decide appeals of order, decisions, or determinations made by the Building Official relative to the application and interpretation of this code, an appeal may be made to the Village Board.

8. Section [A] 113.3, Qualifications, shall be deleted in its entirety.

9. Section 310.3, Residential Group R-2, shall be amended to add the following:

Buildings with more than two dwelling units where any portion of any individual dwelling unit does not extend from the foundation to the roof, regardless of egress arrangement, shall be classified as R-2.

10. Section 310.4, Residential Group R-3, shall be amended to add the following:

Buildings with not more than two dwelling units where any portion of any individual dwelling unit does not extend from the foundation to the roof, regardless of egress arrangement, shall be classified as R-3.

11. Section [F] 903.2 shall be amended to read as follows:

**[F] 903.2 Where required.** An approved automatic sprinkler system shall be provided throughout all new buildings and structures regardless of Group or fire area and in locations described in the Section.

Delete Exception.

12. Section [F] 903.2.1 shall be amended to read as follows:

**[F] 903.2.1. Group A.** An automatic sprinkler system shall be provided for in Group A-1 occupancies.

13. Section [F] 903.2.1.1 shall be amended to read as follows:

**[F] 903.2.1.1 Group A-1.** An automatic sprinkler system shall be provided for in Group A-1 occupancies.

14. Section [F] 903.2.1.2 shall be amended to read as follows:

**[F] 903.2.1.2 Group A-2.** An automatic sprinkler system shall be provided for in Group A-2 occupancies.

15. Section [F] 903.2.1.3 shall be amended to read as follows:

**[F] 903.2.1.3 Group A-3.** An automatic sprinkler system shall be provided for in Group A-3 occupancies.

**Exception:** Areas used exclusively as participant sports areas where the main floor area is located at the same level as exit discharge of the main entrance and exit.

16. Section [F] 903.2.1.4 shall be amended to read as follows:

**[F] 903.2.1.4 Group A-4.** An automatic sprinkler system shall be provided for in Group A-4 occupancies.

**Exception:** Areas used exclusively as participant sports areas where the main floor is located at the same level as exit discharge of the main entrance and exit.

17. Section [F] 903.2.1.5 shall be amended to read as follows:

**[F] 903.2.1.5 Group A-5.** An automatic sprinkler system shall be provided in all Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes, and all other accessory use areas.

18. Section [F] 903.2.2 shall be amended to read as follows:

**[F] 903.2.2 Ambulatory care facilities.** An automatic sprinkler system shall be provided

in any area containing an ambulatory care facility.

19. Section [F] 903.2.3 shall be amended to read as follows:

**[F] 903.2.3 Group E.** An automatic sprinkler system shall be provided throughout all buildings containing a Group E occupancy.

20. Section [F] 903.2.4 shall be amended to read as follows:

**[F] 903.2.4 Group F-1.** An automatic sprinkler system shall be provided throughout all buildings containing a F-1 occupancy.

21. Section [F] 903.2.4.1 shall be amended to read as follows:

**[F] 903.2.4.1 Woodworking operations.** An automatic sprinkler system shall be provided throughout all Group F-1 occupancies that contain woodworking operations.

22. Section [F] 903.2.5.3 shall be amended to read as follows:

23. **[F] 903.2.5.3 Pyroxylin plastics.** An automatic sprinkler system shall be provided throughout buildings where cellulose nitrate film or pyroxylin plastics are manufactured, stored, or handled.

24. Section [F] 903.2.6  
Delete exceptions.

25. Section [F] 903.2.7 shall be amended to read as follows:

**[F] 903.2.7 Group M.** An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy.

26. Section [F] 903.2.9 shall be amended to read as follows:

**[F] 903.2.9 Group S-1.** An automatic sprinkler system shall be provided throughout buildings containing a Group S-1 occupancy.

27. Section [F] 903.2.9.1 shall be amended to read as follows:

**[F] 903.2.9.1 Repair garages.** An automatic sprinkler system shall be provided throughout buildings used as repair garages in accordance with Section 406.

28. Section [F] 903.2.9.2 shall be amended to read as follows:

**[F] 903.2.9.2 Bulk storage of tires.** Buildings and structures used for the storage of tires

shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1

29. Section [F] 903.2.10.1 shall be amended to read as follows:

**[F] 903.2.10.1 Commercial parking garages.** An automatic sprinkler system shall be provided throughout buildings used for the storage of commercial motor vehicles.

30. Section [F] 903.2.11.1 shall be amended to read as follows:

**[F] 903.2.11.1 Stories without openings.** An automatic sprinkler system shall be installed throughout every story or basement of all buildings.

31. Section [F] 903.2.11.3, Buildings over 55 feet in height, delete exceptions.

32. Section 903 shall be amended to add the following section:

**[F] 903.2.13 Group B.** An automatic sprinkler system shall be provided throughout buildings containing a Group B occupancy.

33. Section 903 shall be amended to add the following section:

**[F] 903.2.14 Group F-2.** An automatic sprinkler system shall be provided throughout buildings containing a Group F-2 occupancy.

34. Section 903 shall be amended to add the following sections:

**[F] 903.2.15 Group U.** An automatic sprinkler system shall be provided throughout buildings containing a Group U occupancy.

**[F] 603.2.16 Discontinuation of use.** An automatic sprinkler system shall be provided throughout a building containing any occupancy specified in Section 903 that has been unoccupied for more than 365 consecutive days.

**[F] 603.2.17 Substantial improvement.** An automatic sprinkler system shall be provided throughout a building containing any occupancy specified in Section 903 when the building or structure is substantially improved. Substantial improvement is defined when any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started.

35. Section [F] 903.3.1.1, Exempt locations, delete 2, 3, and 4.

36. Section [F] 903.3.5, Water supplies, shall be amended to read as follows:

**[F] 903.5 Water Supplies.** Water supplies for automatic sprinkler systems shall comply with this Section and the standards referenced in Section 903.3.1. The potable water supply shall be protected against backflow in accordance with the requirements of the Illinois Plumbing Code. A minimum 10% but less than 5 pounds per square inch safety factor shall

be provided in the fire protection system hydraulic calculations. The system demand shall be a minimum of 5 pounds per square inch below the seasonal low water flow test supply. Hydrant water flow data used for the design of any sprinkler system shall be no more than one year old.

37. Section [F] 903.3.6, Hose threads, shall be amended to add the following sections:

**[F] 903.3.6.1 Algonquin–Lake in the Hills Fire Protection District.** The fire department connection on buildings constructed within the Algonquin-Lake in the Hills Fire Protection District shall be based on the fire protection system demand as follows:

1. 400–999 GPM: One four-inch locking Storz FDC with cap.
2. Greater than 1000 GPM: Two four-inch locking Storz FDC’s with caps. The FDC’s shall be remotely located on the building.

**[F] 903.3.6.2 Huntley Fire Protection District.** The fire department connection on buildings constructed within the Huntley Fire Protection District shall be a single five-inch locking Storz FDC with cap.

**[F] 903.3.6.3 Carpentersville Fire Protection District.** The fire department connection on buildings constructed within the Carpentersville Fire Protection District shall be one 2.5-inch x 2.5-inch x 4-inch NST double-clappered Siamese FDC and one four-inch locking Storz FDC with a check valve in the piping between the connections.

**[F] 903.3.7 Fire Department Connections.** Fire department connections shall be visible and unobstructed on a street front, parking lot, fire lane, or other accessible location approved by the Building Official and appropriate fire protection district. A fire hydrant shall be located within 100 feet of fire department connections. A blue weatherproof 75-candela exterior strobe light shall be installed on the exterior of the building above each fire department connection and shall be activated by water flow only.

38. Section 903 shall be amended to add the following section:

**[F] 903.3.9 Fire pump test header.** An outside test header shall be provided on all fire pump installations. An OS&Y control valve with a tamper switch shall be provided on all fire pump test headers.

39. Section 903 shall be amended to add the following section:

**[F] 903.3.10 Riser check valve.** Provide a check valve in each sprinkler riser.

40. Section 903 shall be amended to add the following section:

**[F] 903.3.11 Hydraulic placard information.** A reproduction of each hydraulic placard shall be included on the design drawings near the corresponding hydraulically calculated area.

41. Section 903 shall be amended to add the following section:



**[F] 903.3.12 Sprinkler room access.** Where fire sprinkler risers or fire pumps are located in a separate room, a minimum of a 36-inch side-swinging door complying with Section 715.4 shall be installed to provide direct access into the room from inside and outside of the building. Where the fire sprinkler risers are not located in a separate room, a minimum of a 36-inch side-swinging door complying with Section 715.4 shall be installed in an exterior wall, in an approved location, to provide access to the vicinity of the sprinkler risers from the outside of the building. A sign shall be provided on the exterior of the door(s) with minimum four-inch high letters stating, “SPRINKLER CONTROL VALVES” and/or “FIRE PUMP ROOM,” as applicable.

42. Section [F] 903.4.2 shall be amended to read as follows:

**[F] 903.4.2 Alarms.** A fire alarm shall monitor all automatic sprinkler systems. Approved audible and visual devices shall be connected to every automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Actuation of the automatic sprinkler system shall actuate the building fire alarm system flow alarm, sprinkler bells, and water flow indicating appliances over the fire protection district direct connection. Visual alarm devices shall be arranged so the flashing light beam can be seen at the required level of intensity from all common use areas. Visual alarm appliances shall be provided as directed in Section [F] 907.5.2.3 and in restrooms. Audible alarms shall be arranged so the alarm can be heard in all areas of the building.

43. Section [F] 903.4.3 shall be amended to read as follows:

**[F] 903.4.3 Floor control valves.** Approved, supervised indicating floor control valves with water flow switches shall be provided at the point of connection to the riser on each floor in multiple story buildings, including all floor levels below grade.

44. Section [F] 903 shall be amended to add the following section:

**[F] 903.6. Yard Hydrants.** Fire hydrants shall be provided around the perimeter of a building in 300 feet increments.

45. Section [F] 905.3 shall be amended as follows:

**[F] 905.3 Required Installations.** Class I standpipe systems shall be installed where required by Sections 905.3.1 through 905.3.7 and in locations indicated in Sections 905.4. Standpipe systems are permitted to be combined with automatic sprinkler systems unless otherwise noted. Exception: Standpipe systems are not required in buildings and structures regulated by the International Residential Code in accordance with Section 101.2, Exception 1.

46. Section [F] 905.301 shall be amended as follows:

**[F] 905.3.1 Height.** Class I standpipe systems shall be installed throughout all buildings and portions of buildings: 1. With more than two stories above the lowest level of fire de-

partment vehicle access. 2. With more than two stories below the highest level of fire department vehicle access. 3. Where there is a floor level located more than 30 feet above the lowest level of fire department vehicle access, including mezzanines. 4. Where there is a floor level located more than 30 feet below the highest level of fire department vehicle access, including mezzanines. 5. Where any portion of the building floor area, including mezzanines, is more than 400 feet of travel from the nearest point of fire department vehicle access.

47. Section [F] 905.3 shall be amended to add the following Section:

**Section [F] 905.3.9 High-piled combustible storage.** Buildings or portions of buildings with high-piled combustible storage shall be equipped with a Class I automatic wet standpipe system. Standpipe hose connections shall be located in high-piled combustible storage areas where storage exceeds 12 feet in height. Hose connections shall be located at each door to the high-piled combustible storage area. Where the travel distance between hose connections exceeds 200 feet, the Building Official is authorized to require additional hose connections be provided in approved locations. The standpipe system shall be: 1. A separate riser piping system. 2. Hydraulically calculated for a minimum of 250 gallons per minute at 75 pounds Chapter 23, Page 19 4/22/14 per square inch to the most hydraulically remote fire hose valve. 3. Where system pressures exceed 100 pounds per square inch, a reduced pressure field-adjustable type hose valve shall be provided.

48. Section [F] 905.4 shall be amended to add:

7. In Group A-1 and A-2 occupancies with occupant loads of more than 1,000, hose connections shall be located on each side of any stage, on each side of the rear of the auditorium, on each side of the balcony, and on each tier of dressing rooms.

49. Section [F] 905.4 shall be amended to add the following to the list of locations of Class I standpipe hose connections:

7. In Group A-1 and A-2 occupancies with occupant loads of more than 1,000, hose connections shall be located on each side of any stage, on each side of the rear of the auditorium, on each side of the balcony, and on each tier of dressing rooms.

50. Section [F] 905.4 shall be amended to add the following section:

**[F] 905.4.3 Hose connection threads.** Each Class I standpipe hose connection shall be equipped with a 2.5-inch NST male hose valve, with a removable 2.5-inch female to 1.5-inch male adapter, which shall be permanently chained to the hose connection.

51. **Section [F] 905.5 Locations of Class II standpipe hose connections.** Shall be deleted in its entirety.

52. **Section [F] 905.6 Location of Class III standpipe hose connections.** Shall be deleted in its entirety.

53. Section [F] 907.1.3, Equipment, shall be amended to read as follows:

**[F] 907.1.3. Equipment.** All fire alarm systems shall be of the addressable type. Systems

and their components shall be listed and approved for the purpose for which they are installed.

54. Section [F] 907.2, Where required, shall be amended to read as follows:

**[F] 907.2 Where required.** An approved manual, automatic, or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in accordance with Section 907.2.1 through 907.2.23, as amended, and provide occupant notification in accordance with Section 907.9. An approved manual fire alarm system shall be provided in all Groups. An approved automatic fire detection system installed in accordance with NFPA 72 shall be provided in all non-sprinklered Groups. Where automatic sprinkler protection, installed in accordance with Section 903.1.1 or 903.1.2, is provided and connected to the building fire alarm system, automatic heat detection required by this Section shall not be required. Devices, combinations of devices, appliances, and equipment shall comply with Section 907.1.2. The automatic fire detectors shall be smoke detectors, except that an approved alternative type of detector shall be installed in spaces such as boiler rooms where, during normal operation, products of combustion are present in sufficient quantity to activate a smoke detector. All fire alarm control panels of full function annunciator panels shall be installed within 10 feet of the main entrance or in a location approved by the fire protection district.

55. Section [F] 907.2.1, Group A, delete the exception.

56. Section [F] 907.2.2, Group B, delete the exception.

57. Section [F] 907.2.3, Group E, delete exception 2.

58. Section [F] 907.2.4, Group F, delete the exception.

59. Section [F] 907.2.7, Group M, delete exception 2.

60. Section [F] 907.2.8.1, Manual fire alarm system, shall be amended to read as follows:

**[F] 907.2.8.1 Manual fire alarm system.** A manual fire alarm system shall be installed in accordance with NFPA 72 in all Group R-1 occupancies.

Delete Exceptions 1 and 2.

61. Section [F] 907.2.9, Group R-2, shall be amended to read as follows:

**[F] 907.2.9.1 Group R-2.** A manual fire alarm system shall be installed in accordance with NFPA 72 in all Group R-2 common areas. An automatic fire detection system shall be installed in accordance with NFPA 72 in all Group R-2 common areas.

Delete Exceptions 1, 2, and 3

62. Section [F] 907.2.12, High-rise buildings, all exceptions shall be deleted.

63. Section [F] 907.6.4, Zones, shall be amended to read as follows:
64. **[F] 907.6.4 Zones.** Each floor shall be zoned separately and a zone shall not exceed 22,500 square feet. The length of any zone shall not exceed 300 feet in any direction. Multi-tenant buildings shall ring by tenant space.
65. Chapter 29, Plumbing Systems and the Illinois State Plumbing Code shall govern the erection, installation, alterations, repairs, relocation, replacement, addition to, use, or maintenance of plumbing equipment and systems. Plumbing systems and equipment shall be constructed, installed, and maintained in accordance with the Illinois State Plumbing Code.

#### 23.06 **INTERNATIONAL FIRE CODE/2018**

The International Fire Code, 2018 edition, and appendices B, C, and D, (“Fire Code”), be and the same are hereby adopted by reference and made a part of this Section, subject to modifications set forth herein, and shall be applicable to the Village.

#### 23.07 **MODIFICATIONS TO THE FIRE CODE**

The Fire Code shall be amended as follows:

1. For the purpose of this code, any Fire Code sections repeated within the International Building Code and modified therein shall also be considered modified accordingly within the Fire Code.
2. Section 101.1, insert Village of Algonquin.
3. Section 109.1 shall be amended to read as follows:  
**109.1 Board of appeals established.** In order to hear and decide appeals of order, decisions, or determinations made by the fire code/building code official relative to the application and interpretation of this code, an appeal may be made to the Village Board.
4. Section 109.3, Qualifications, shall be deleted in its entirety.
5. Open Burning and Recreational Fires shall be deleted in its entirety (refer to Section 43.08 of the Village of Algonquin Municipal Code)

#### 23.08 **INTERNATIONAL MECHANICAL CODE/2018**

The International Mechanical Code, 2018 edition, (“Mechanical Code”) be and the same is hereby adopted by reference and made part of this Section, subject to modifications set forth herein, and shall be applicable to the Village.

#### 23.09 **MODIFICATIONS TO THE MECHANICAL CODE**

The Mechanical Code shall be amended as follows:

1. Section [A] 101.1, insert Village of Algonquin.

2. Section [A] 106.5.2, insert Appendix B of the Village of Algonquin Municipal Code.

3. Section [A]106.5.3 shall be amended to read as follows:

**[A] 106.5.3 Fee refunds.** Refunds for mechanical permits shall be in accordance with Appendix B of the Village of Algonquin Municipal Code

4. Section [A] 108.4, insert Appendix B of the Village of Algonquin Municipal Code.

5. Section [A] 108.5, insert Appendix B of the Village of Algonquin Municipal Code.

6. Section [A] 109.1 shall be amended to read as follows:

**[A] 109.1 Application of appeal.** A person shall have the right to appeal a decision of the Code Official to the Village Board. An appeal shall be based on a claim that the intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed.

7. The following sections shall be deleted in their entirety:

- Section [A] 109.2 Membership of board.
- Section [A] 109.2.2 Alternate members.
- Section [A] 109.2.3 Chairman.
- Section [A] 109.2.4 Disqualification of member.
- Section [A] 109.2.5 Secretary.
- Section [A] 109.2.6 Compensation of members.
- Section [A] 109.3 Notice of meetings.
- Section [A] 109.4 Open hearings.
- Section [A] 109.4.1 Procedure.
- Section [A] 109.5 Postponed hearing
- Section [A] 109.6 Board decision
- Section [A] 109.6.1 Resolution
- Section [A] 109.6.2 Administration

### 23.10 **INTERNATIONAL FUEL GAS CODE/2018**

The International Fuel Gas Code, 2018 edition, (“Fuel Gas Code”) be and the same is hereby adopted by reference and made part of this Section, subject to modifications set forth herein, and shall be applicable to the Village.

### 23.11 **MODIFICATIONS TO THE FUEL GAS CODE**

The Fuel Gas Code shall be amended as follows:

1. Section [A] 101.1, insert Village of Algonquin.
2. Section [A] 106.6.2, insert Appendix B of the Village of Algonquin Municipal Code.

3. Section [A] 106.6.3 shall be amended to read as follows:

**[A] 106.6.3 Fee refunds.** Refunds for permit fees shall be in accordance with Appendix B of the Village of Algonquin Municipal Code.

4. Section [A] 108.4, insert Appendix B of the Village of Algonquin Municipal Code.

5. Section [A] 108.5, insert Appendix B of the Village of Algonquin Municipal Code.

6. Section [A] 109.1 shall be amended to read as follows:

**[A] 109.1 Application of appeal.** A person shall have the right to appeal a decision of the Code Official to the Village Board. An appeal based on a claim that the intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed.

7. The following sections shall be deleted in their entirety:

Section [A] 109.2 Membership of board  
Section [A] 109.2.2 Alternate members  
Section [A] 109.2.3 Chairman  
Section [A] 109.2.4 Disqualification of member  
Section [A] 109.2.5 Secretary  
Section [A] 109.2.6 Compensation of members  
Section [A] 109.3 Notice of meeting  
Section [A] 109.4 Open hearing  
Section [A] 109.5 Postponed hearing  
Section [A] 109.6 Board decision  
Section [A] 109.6.1 Resolution  
Section [A] 109.6.2 Administration

8. Section 401.5 Identification shall be amended to add the follows:

Exterior gas piping shall be coated to protect the piping from corrosion. Exterior gas piping located on the roof shall be painted yellow. All other exterior gas piping shall be painted to match the exterior of the building.

### 23.12 NATIONAL ELECTRICAL CODE/2017

The National Electrical Code, 2017 edition, promulgated by the National Fire Protection Association, (“Electrical Code”) be and the same is hereby adopted by reference and made part of this Section, subject to modifications set forth herein, and shall be applicable to the Village.

### 23.13 MODIFICATIONS TO THE NATIONAL ELECTRICAL CODE

The Electrical Code shall be amended as follows:

1. Article 110.2 shall be amended to add the following:

All electrical devices, conductors, and equipment shall be listed by a recognized and approved testing laboratory, or by express written approval from the Electrical Inspector.

2. Article 110.12 shall be amended to add the following:

110.12(C). All accessible temporary and/or abandoned wiring conductors, conduit systems, raceways, junction boxes, electrical materials, and electrical equipment shall be completely removed, unless express written approval is obtained from the Electrical Inspector.

3. Article 110.34 shall be amended to add the following:

(G) Utility sinks, water hose bibs, drinking fountains, and similar fixtures shall not be installed in a dedicated electric panel or switch gear room in commercial or industrial buildings. In a non-dedicated electric panel or switch gear room, utility sinks, water hose bibs, drinking fountains, and similar fixtures shall not be installed within six (6) feet of electric service panels or switch gear.

4. Article 210.8(A)(1) shall be amended to add the following:

No less than one 20-ampere GFCI-protected duplex outlet shall be provided for every vanity sink installed in a residential occupancy.

5. Article 210.8(A)(7) shall be amended to add the following:

Not less than one GFCI-protected duplex outlet shall be provided for every wet bar sink.

6. Article 210.8(B) shall be amended to add the following:

(4) All outdoor outlets in all residential, commercial and industrial construction shall be GFCI-protected.

(5) All indoor receptacles in residential, commercial and industrial construction shall be GFCI-protected, if within six feet of sinks, water hose bibs, drinking fountains, any equipment with exposed or accessible water, open water, or similar fixtures.

7. Article 210.10(C) shall be amended to add the following:

(5) All required smoke detectors shall be 110-volt with battery backup, interconnected and supplied by a general lighting circuit. Where smoke detectors are installed adjacent to unconditioned spaces, conduit shall be connected to the side of the junction box or an approved sealant to the top of the junction box entries.

Exception. Existing non-modified structures shall have wireless battery-powered interconnected smoke detectors, at locations where required.

8. Article 210.11(A) shall be amended to add the following:

(1) All sump pumps and ejector pumps shall each be supplied by a separate circuit..

- (2) All furnaces and air conditioners shall each be supplied by a separate circuit.
9. Article 220.10 shall be amended to add the following:
- In no case shall the electric service size for a single-family detached dwelling unit be less than 200 ampere, with a 40-circuit panel; or
- Less than 200 ampere electric service with a 40-circuit panel for single-family attached dwelling units with 1,400 square feet or more of living space; or
- Less than 100 ampere electric service with a 20-circuit panel for single-family attached dwelling units with 1,399 square feet or less of living space; or
- Less than 400 ampere electric service with an 80-circuit panel for single-family dwelling units with 4,000 or more square feet of living space.
10. Article 230.70(A) shall be amended to add the following:
- Service disconnecting means shall be located outside of the building or within five feet of the point in which the service conductors enter the building.
11. Article 2240 shall be amended to add the following:
- Circuit breakers. Only one conductor per screw terminal shall be permitted on full size single-pole, 2-pole and 3-pole circuit breakers. Mini-circuit breakers and double/single-pole combination circuit breakers shall not be installed in any service panel, sub-panel or disconnect enclosure of any size or type.
12. Article 250.34 shall be amended to add the following:
- A permit shall be obtained from the Community Development Department prior to the use of a portable generator of 10,000 watts or more in size; a separate permit may be issued each day of operation.
13. Article 310.10 shall be amended to read as follows:
- All conductor material shall be copper.
14. Article 348.10 shall be amended to add the following:
- Flexible metal conduit: Type FMC (Greenfield) can be used in enclosed areas with a proper sized equipment grounding conductor in compliance with Article 250.122.
15. Article 358.10(A) shall be amended to add the following:
1. Interior above slab wiring: All 110-volt and higher voltage conductors shall be enclosed in EMT (Electrical Metallic Tubing), or IMC (Intermediate Metal Conduit) or RMC (Rigid Metal Conduit) installed in accordance with this Code shall be used for interior above slab wiring.



2. Exterior above grade exposed wiring: All exterior above grade exposed wiring shall be enclosed in IMC (Intermediate Metal Conduit) or RMC (Rigid Metal Conduit) and installed in accordance with the Code.
  3. Under slab and below grade wiring: Rigid PVC and RTRC (Reinforced Thermo-setting Resin Conduit) or RMC (Rigid Metal Conduit) installed in accordance with this code may be used below grade and under slab wiring. Direct burial wiring shall be used for underground service entrance conductors.
  4. Other raceways and wireways may be permitted by express written approval by the Electrical Inspector.
16. Article 404.2 shall be amended to add the following:
- A three-way switch or interior motion sensing switching device or photocell device shall be provided for interior lighting in all screen rooms, sunrooms, and additions classified as three-season rooms, constructed off an exterior door.
17. Article 404.4 shall be amended to add the following:
- (D) Switches shall be located at least five feet measured horizontally, from the inside walls of a bathtub, whirlpool tub, hot tub, spa, hydro-massage bathtub, tub/shower combination, shower stall or shower enclosure.
18. Article 406.9(C) shall be amended to add the following:
- (D) Receptacles shall be located at least six feet measured horizontally, from the inside walls of a bathtub, whirlpool tub, hot tub, spa, hydro-massage bathtub, tub/shower combination, shower stall or shower enclosure.
19. Article 410.10 shall be amended to add the following:
- (G) Ceiling mounted, open or exposed, glass tube fluorescent luminaires shall be provided with fall protection for the light bulbs.
20. Article 410.30 (B) (3) shall be amended to add the following:
- A 5/8 inch by eight foot, copper-clad ground rod shall be provided for all light pole bases; the ground rod shall be properly terminated and accessible from the hand hole.
21. Article 422.16 (B) shall be amended to add the following:
- (5) All dishwashers and food waste disposals installed in residential occupancies shall be hard-wired and shall be equipped with a disconnect located within sight of the appliance.
- Exception: Appliances equipped with factory-installed power cords.
22. Article 700.12.12 IV shall be amended to add the following:

Emergency systems shall be properly identified.

23. Article 700.16 shall be amended to add the following:

Emergency lighting consisting of not less than two lamps shall be provided in all non-residential bathrooms, connected to the bathroom lighting circuit.

24. Article 760 shall be amended to add the following:

Accessible fire alarm cable, conduit, and junction boxes shall be the color red in their entirety.

- 26 Requirements for Electrical Contractors:

It shall be unlawful for any person to engage in the business of electrical contracting without being a licensed Electrical Contractor. If such person is licensed for the current year in another City or Village within the State of Illinois, in conformity with the State Statutes, such Electrical Contractor shall be required to show proof of such license. The term "Licensed Electrical Contractor" as used in Section shall be understood to mean any person installing or altering electric equipment for the utilization of electricity supplied for light, heat or power; not including radio apparatus or equipment for wireless reception of sounds and signals, conductors and other equipment installed under the jurisdiction of the Illinois Commerce Commission, for use in their operation as Public Utilities; but the term "Licensed Electrical Contractor" does not include employees of an electrical contractor who perform and supervise work. The Corporate Authorities, by virtue of the Illinois Compiled Statutes, requires candidates for electrical contracting to successfully complete a written examination administered by any Illinois Municipality that administers written examinations.

#### **23.14 ILLINOIS STATE PLUMBING CODE/2014**

The Illinois State Plumbing Code, 2014 edition, (State of Illinois Plumbing License Law, Plumbers Licensing Code and Plumbing Code) ("Plumbing Code") be and the same, is hereby adopted by reference and made part of this Section, subject to the modifications set forth herein and shall be applicable to the Village. No plumbing work, unless modified by this Chapter, shall be undertaken prior to the issuance of a permit by the Building Commissioner. The application for a permit shall be made on forms provided by the Building Commissioner and shall be accompanied by the prescribed permit fees as set forth in Appendix B.

#### **23.15 INTERNATIONAL ENERGY CONSERVATION CODE/2018**

The International Energy Conservation Code, 2018 edition, ("Energy Conservation Code") be and the same, is hereby adopted by reference and made part of this Section, subject to the modifications set forth herein, and shall be applicable to the Village.

#### **23.16 MODIFICATIONS TO THE ENERGY CONSERVATION CODE**

The Energy Conservation Code shall be amended as follows:

1. Section C101.1, insert Village of Algonquin
2. Section C109 shall be amended to add the following:

**C 109.1 General.** In order to hear and decide appeals of orders, decisions, or determinations made by the Code Official relative to the application and interpretation of this code, an appeal may be made to the Village Board.

3. Section C109.3 Qualifications, shall be deleted in its entirety

#### 23.17 **INTERNATIONAL EXISTING BUILDING CODE/2018**

The International Existing Building Code, 2018 edition, (“Existing Building Code”) be and the same, is hereby adopted by reference and made part of the Section, subject to modifications set forth herein, and shall be applicable to the Village.

#### 23.18 **MODIFICATIONS TO THE EXISTING BUILDING CODE**

The Existing Building Code shall be amended as follows:

1. Section [A] 101.1, insert Village of Algonquin
2. Section [A] 101.2 shall be amended to read as follows:

**[A]101.2 Scope.** The provisions of the Existing Building Code shall apply to the repair, alteration, change of occupancy, addition, and relocation of existing, non-residential, and mixed-use occupancy buildings. New buildings or a building or portion of a building that has not been previously occupied or used for its intended purpose shall comply with the provisions of the Building Code for new construction. Repairs, alterations, change of occupancy, existing buildings to which additions are made, historic buildings, and relocated buildings complying with the provisions of the Building Code, Mechanical Code, Plumbing Code, Electrical Code, and Residential Code, as applicable, shall be considered in compliance with the provisions of the code.

3. Section [A] 105.2, Work exempt from permit, delete: 1, 3, 4, and 5.
4. Section [A] 112.1 shall be amended to read as follows:

**[A] 112.1 General.** In order to hear and decide appeals of orders, decisions, or determinations made by the Code Official relative to the application and interpretation of this code, an appeal may be made to the Village Board.

5. Section [A] 112.3, Qualifications, shall be deleted in its entirety.

#### 23.19 **INTERNATIONAL PROPERTY MAINTENANCE CODE/2018**

The International Property Maintenance Code, 2018 edition, (“Property Maintenance Code”) be and the same, is hereby adopted by reference and made part of this Section, subject to modifications set forth herein, and shall be applicable to the Village.

## 23.20 MODIFICATIONS TO THE PROPERTY MAINTENANCE CODE

The Property Maintenance Code shall be amended as follows:

1. Section [A] 101.1 insert Village of Algonquin.
2. Section [A] 111.1 shall be amended to read as follows:

**[A] 111.1 Application for appeal.** Any person directly affected by a decision of the Code Official or a notice of order issued under this code shall have the right to appeal to the Village Board, providing that a written application for an appeal is filed within 20 days after the day the decision, notice, or order was served. An application for appeal shall be based on a claim that the true intent of this code, or the rules legally adopted thereunder, have been incorrectly interpreted, the provisions of this code do not apply, or the requirements of this code are adequately satisfied by other means.

3. Section [A] 111.2 Membership of board, shall be deleted in its entirety.
4. Section [A] 111.3 Notice of meeting, shall be deleted in its entirety.
5. Section [A] 111.4 Open hearing, shall be deleted in its entirety.
6. Section [A] 111.5 Postponed hearing, shall be deleted in its entirety.
7. Section [A] 111.6 Board decision, shall be deleted in its entirety.
8. Section 302.2 shall be amended to add:

**302.2.1 Sump pump and downspout discharge.** The discharge from a sump pump and/or roof drainage downspout shall not discharge directly or indirectly on or over any public street, sidewalk, bike path, or right-of-way; and the outlet of sump pump discharge piping shall not be located within five feet of a property line, shall be orientated to discharge in the direction of the engineered drainage path, and shall not cause standing water on adjacent properties.

9. Section 302.4, 8 inches shall be inserted.
10. Section 302.8 shall be amended to read as follows:

**302.8 Motor and recreational vehicles.** All motor and recreational vehicles, including but not limited to cars, vans, trucks, construction/excavating/landscape equipment, motorized bikes/motorcycles, boats, watercraft, snowmobiles, campers, aircraft, all-terrain vehicles,

and trailers, shall be parked on an approved surface of four inches of concrete over a four-inch compacted gravel base or two inches of asphalt over a six-inch compacted base, or paving bricks designed for motor vehicle traffic, installed in accordance with manufacturer's installation instructions, or completely enclosed in a structure designed and approved for such purpose. Motor vehicles, recreational vehicles, and equipment parked on an approved surface shall be accessible without maneuvering over lawn, grass, curbs, or any unpaved surface. No more than two recreational vehicles shall be visible on a zoning lot. No part of any motor or recreational vehicle, when parked, shall encroach over a public sidewalk or bike path, and in no case shall equipment or a recreational vehicle be parked on public property. No vehicle shall, at any time, be in a state of major disrepair, disassembled, or in the process of being stripped or dismantled.

**Exception:** A vehicle of any type is permitted to undergo major repair provided that such work is performed inside an enclosed structure designed and approved for such purpose.

11. Section 304.14 shall be amended to insert April 15 to November 1.

12. Section 307.2 shall be amended to read as follows:

**308.2 Disposal of rubbish.** Every occupant of a structure shall dispose of all rubbish and recycling in a clean and sanitary manner pursuant to Chapter 13 of this Code and by placing such rubbish and items intended for recycling in approved containers and stored in a location with minimal exposure to the public view.

**Exception:** Rubbish and recycling may be placed on the right-of-way after 5:00 p.m. the day prior to the scheduled rubbish collection day, and all rubbish and recycling containers shall be removed from the right-of-way by 11:00 p.m. the day of rubbish collection.

13. Section 308.2 shall be amended add:

**308.2.3 Special pick-up.** Items requiring a special pick-up, such as refrigerators, water heaters, stoves, ovens, cook tops, furniture, carpeting, and construction material, shall not remain on the right-of-way for more than 48 hours.

14. Chapter 3 shall be amended to add a new section, which shall read as follows:

## **SECTION 310 YARDWASTE COMPOSTING.**

**310.1 Compost piles and bins.** Compost piles and bins shall comply with the following requirements:

1. Compost piles and bins shall be located in side or rear yards.
2. Compost piles and bins shall not exceed four feet in height and in diameter.
3. Compost piles and bins shall not be placed or tended in such a way as to allow materials to be wind-blown.
4. Compost piles and bins shall not emit odorous matter in such quantities as to be

readily detectable at any point along any lot line, or to otherwise produce a public nuisance or hazard beyond any lot line.

5. Compost piles or bins shall be located not less than five feet from any lot line and out of any easement.

**310.2 Composting material.** Compost material shall be comprised of approximately an equal mixture of carbon-rich (brown) material and nitrogen-rich (green) material.

**310.2.1 Carbon-rich material.** The following examples are acceptable carbon-rich (brown) material:

1. Leaves
2. Pine needles
3. Small twigs and branches
4. Wood chips and shavings
5. Bark pieces
6. Straw

**310.2.2 Nitrogen-rich material.** The following examples are acceptable nitrogen-rich (green) material:

1. Grass clippings
2. Weeds
3. Spent flowers and plants
4. Vine and other soft prunings from the garden
5. House plant trimmings

**310.2.3 Improper compost material.** The following examples are improper composting materials and shall not be permitted:

1. Animal and dairy products
2. Meats
3. Fats, oils and grease
4. Animal feces

**310.3 Compost maintenance.** Compost piles shall be maintained neatly and not allowed to sprawl. Piles of grass clippings and/or large branches are not considered composting and shall not be permitted.

15. Section 602.3, insert September 15 to May 15.
16. Section 602.4, insert September 15 to May 15.
17. The following section shall be added:

## **SECTION 801            DRIVEWAYS**

**801.1 Driveways.** All driveways and off-street parking areas shall be paved with a surface

of not less than four inches of concrete over a four-inch compacted base course or not less than two inches of asphalt over a six-inch compacted base course or paving bricks designed for motor vehicle traffic, installed in accordance with manufacturer's installation instructions. Gravel driveways and off-street parking areas are not permitted. Any nonconforming gravel driveway or off-street parking area shall be paved in accordance with this code no later than December 1, 2009.

18. The following sections shall be added:

## **SECTION 706 SALT STORAGE**

**706.1 Salt Storage.** In the interest of limiting pollution to our environment and waterways and ultimately preventing contamination of our groundwater resources, all properties which store bulk rock salt for winter snow or ice removal operations shall comply with these regulations. Prior to the installation of any salt storage, a permit, which is valid November through April, shall be obtained from the Community Development Department. The permit fee is found in Appendix B of this Code. The permit application shall include the amount of salt to be stored, a site plan that includes the location and dimensions of the storage site, as well as any storm sewer drains within 125 feet of the storage site, the amount of salt to be stored, the method by which the salt will be covered and additional measures that will be undertaken to minimize visual impact to public ways and/or adjacent residential uses.

Properties not in compliance with the salt storage requirements shall be fined pursuant to Appendix B of this Code until the storage is brought into compliance. Those properties containing a salt pile without a valid permit shall be fined pursuant to Appendix B of this Code and required to obtain a permit or remove the salt pile.

Salt storage shall comply with the following requirements:

1. The maximum amount of storage allowed shall not exceed four storm events.
2. The salt within the salt storage location shall be covered with a water-resistant tarp or similar protective cover, which shall be adequately secured to prevent damage from wind and/or water at all times.
3. The location shall be not less than 100 feet from any storm sewer drain.
4. The location shall be uphill and away from snow piles.
5. The location shall be in an area that minimizes visual impact to public ways and/or adjacent residential uses.
6. The salt pile and area used for truck loading and unloading shall be diligently swept and maintained free of loose salt and debris at all times. The area shall be kept in a clean, workmanlike manner at all times.

7. All unused salt and the site shall be cleaned up no later than April 15<sup>th</sup>.

### 23.21 ILLINOIS ACCESSIBILITY CODE/2018

The Illinois Accessibility Code, effective date October 23, 2018, (71 Illinois Administrative Code 400) (“Accessibility Code”) be and the same, is hereby adopted by reference and made part of this Section and shall be applicable to the Village. In the event of a conflict between the provisions of the Illinois Accessibility Code and the International Building Code, the most restrictive provisions shall apply.

### 23.22 INTERNATIONAL SWIMMING POOL AND SPA CODE/2018

The International Swimming Pool and Spa Code, 2018 edition, (“Swimming Pool and Spa Code”) be and the same, is hereby adopted by reference and made part of this Section, subject to modifications set forth herein, and shall be applicable to the Village.

### 23.23 MODIFICATIONS TO THE SWIMMING POOL AND SPA CODE

The Swimming Pool and Spa Code shall be amended as follows:

1. Section [A] 101.1 insert Village of Algonquin.
2. Section [A] 108.1 shall be amended to read as follows:

**[A] 108.1 Application for appeal.** Any person directly affected by a decision of the Code Official or a notice of order issued under this code shall have the right to appeal to the Village Board, providing that a written application for an appeal is filed within 20 days after the day the decision, notice, or order was served. An application for appeal shall be based on a claim that the true intent of this code, or the rules legally adopted thereunder, have been incorrectly interpreted, the provisions of this code do not apply, or the requirements of this code are adequately satisfied by other means.

3. The following sections shall be deleted in their entirety

Section [A] 108.2 Membership of board  
Section [A] 108.2.1 Qualifications  
Section [A] 108.2.2 Alternate members  
Section [A] 108.2.3 Chairman  
Section [A] 108.2.4 Disqualification of member  
Section [A] 108.2.5 Secretary  
Section [A] 108.2.6 Compensation of members  
Section [A] 108.3 Notice of meeting  
Section [A] 108.4 Open hearing  
Section [A] 108.5 Postponed hearing  
Section [A] 108.6 Board decision  
Section [A] 108.6.1 Resolution  
Section [A] 108.6.2 Administration



4. Section 305.5 Onground residential pool structure as a barrier, shall be amended to read as follows:

**Onground residential pool structure as a barrier.** Where an onground pool structure is used as a barrier, an additional barrier shall be mounted on top of the pool structure. The maximum vertical clearance between the top of the pool and the bottom of the barrier shall be four inches. The minimum vertical height of the barrier above the top of the pool shall be 18 inches and in no case shall the top of barrier be less than 48 inches above grade for the entire perimeter of the pool and comply with the requirements of Section 305.2. Where the barrier is mounted on top of the pool structure and means of access is a ladder or steps:

1. The ladder or steps shall be designed and manufactured to meet the barrier requirements of Section 305.2; or
2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section 305.2.

#### 23.24 **PERMIT FEE SCHEDULE**

Permit fees are found in Appendix B of this Code.

#### 23.25 **KANE COUNTY ROAD IMPROVEMENT IMPACT FEE**

All developers of new development in Kane County, as defined in Kane County Ordinance No. 04-22, Kane County Road Improvement Impact Fee Ordinance, are required to submit, with their building permit application, a copy of their receipt of payment reflecting payment of the Kane County Road Improvement Impact Fee.

#### 23.26 **IDENTIFICATION OF LOCAL BUILDING CODE NOT ADOPTED**

Notwithstanding the provisions of 20 ILCS 3918/55, the Village shall not provide the identification of a new building code or amendment thereto, its title and edition, to the State of Illinois Capital Development Board, or its successor, for placement on the Internet through the State of Illinois worldwide website.

**Section 23.23 Permit Fee Schedule**

A. The building permit fee for the construction of new buildings, additions and interior build-outs, not including electrical, plumbing, mechanical or other fees required by this Section shall be calculated as follows:

1. Residential, one-family detached & attached

a. With basement or crawlspace:	\$0.84 per square foot of living area; plus \$0.30 per square feet of garage area
b. Without basement or crawlspace:	\$0.72 per square foot of living area; plus \$0.30 per square feet of garage area

2. Non-residential

a. New building:	\$0.99 per square foot
b. Interior build-out in existing building:	\$0.75 per square foot

3. Residential detached garage:

	\$0.30 per square foot of area \$50.00 minimum
--	--

4. The greater of 23.23.A.1, 23.23.A.2, 23.23.A.3 or .75% of the construction cost indicated on the Building Permit Application.

B. Alterations, remodeling or repairs not associated with the construction of new buildings, additions, or interior buildouts, not including electrical, plumbing, mechanical and other fees required by this section shall be calculated as follows:

Residential, one-family detached & attached:	.75% of construction cost \$45.00 minimum.
Non-residential:	.75% of construction cost \$85.00 minimum

C. Permit fee amounts shall be rounded up to the next greater dollar.

**Plumbing:**

Installation of new plumbing fixture	\$25.00 per fixture; \$45.00 minimum
Replacement of water heater	\$10.00 per unit
Water or sewer connection (new, replacement, repair)	\$75.00
Landscape irrigation	\$0.80 per head; \$90.00 minimum

**HVAC:**

Installation of new heating equipment	\$100.00 for the first 100,000 BTUs Plus \$25.00 per each additional 100,000 BTUs or fraction thereof
Installation of new cooling equipment	\$100.00 for the first three tons Plus \$25.00 per each additional three tons or fraction thereof.
Installation of new natural gas piping	\$25.00 per gas fired appliance; \$45.00 minimum
Replacement of heating or cooling equipment	\$45.00 per residential appliance; \$95.00 per non-residential appliance.

Installation of new exhaust equipment	\$50.00 for the first 500 CFM Plus \$25.00 each additional 500 CFM or fraction thereof
Commercial kitchen hood & duct	\$200.00 per hood

## Electrical

### Electric Service (new, replacement, temporary):

0-100 amperes	\$100.00
101-200 amperes	\$175.00
201-400 amperes	\$225.00
401-1,000 amperes	\$275.00
1,001-4,000 amperes	\$400.00
4,001-10,000 amperes	\$550.00
Over 10,000 amperes	\$550.00 plus \$125.00 per each additional 1,000 amperes or fraction thereof.

### Electrical installation for new residential detached & attached

0-1,400 square feet of living area	\$225.00 plus electric service
1,402-4,000 square feet of living area	\$450.00 plus electric service
Over 4,000 square feet of living area	\$575.00 plus electric service

### Electric installations for new non-residential Buildings, additions, alterations and interior build-outs

	20% of the permit fee as calculated in Section 23.23.A plus electric service. Minimum \$85.00
--	---

### Electric installations for residential one-family detached and attached additions and alterations.

	\$0.30 per square feet of area; Minimum \$45.00
--	---

### Emergency whole house generator

	\$100.00
--	----------

### Temporary generator; over 10,000 watts (10kw)

	\$100.00 for each seven days of operation or fraction thereof
--	---

### Rooftop Photovoltaic residential one-family installation

	\$100.00
--	----------

### Rooftop Photovoltaic Non-residential Installation

	Convert total electric generated into amperes; calculate fee in accordance with new Electric Service Section of this Chapter. Minimum \$100.00
--	--

### Wind turbine generator, one-family installation

	\$100.00
--	----------

Wind turbine generator, non-residential installation

	Convert total electric generated into amperes; calculate fee in accordance with new Electric Service Section of this Chapter. Minimum \$100.00
--	--

**Fire Protection Systems:**

Sprinkler system, new installation

1-20 heads	\$210.00
21-100 heads	\$435.00
101-200 heads	\$580.00
201-300 heads	\$665.00
305-500 heads	\$980.00
Over 500 heads	\$980 plus \$1.10 per each additional head

Additions and alterations to existing sprinkler system

	50% of new installation; \$85.00 minimum
--	--

Residential one-family detached & attached sprinkler system

	\$190.00
--	----------

Complete fire alarm system, new installation

	\$0.215 per square foot of building area; \$200 minimum
--	---

Partial fire alarm system or alteration of existing alarm system

	\$0.011 per square foot of building area; \$200 minimum
--	---

Commercial hood & duct suppression

	\$200.00 per hood
--	-------------------

Fee for fire protection system reviewed by consultant

	Equal to 10% of the invoiced review fee; \$85.00 minimum
--	--

**Plan Examination:**

New one-family detached & attached	\$95.00 dwelling unit
Residential one-family addition, alteration, remodeling	10% of the permit fee, calculated per Section 23.23.A.1; \$45.00
Non-residential additions, alterations, remodeling	10% of permit fee, calculated per Section 23.23.A.2; \$85.00 minimum
<i>New buildings:</i>	
1-60,000 cubic feet	\$375
60,001-80,000 cubic feet	\$450
80,001-100,000 cubic feet	\$500
100,001-150,000 cubic feet	\$575
Over 150,000 cubic feet	\$750 + \$7.50 per each additional 10,000 cubic feet or fraction thereof
Mechanical Code review	25% of Building Code review fee; \$95 minimum
Plumbing Code review	25% of Building Code review fee; \$95 minimum

Electrical Code review	50% of Building Code review fee; \$95 minimum
Accessibility Code review	25% of Building Code review fee; \$95 minimum
Building plans reviewed by consultant	Equal to the invoiced review fee plus \$50.00

**Miscellaneous:**

Certificate of Occupancy, one-family detached & attached	\$75.00 dwelling unit
Certificate of Occupancy, non-residential	\$20.00 per 1,000 square feet of area or fraction thereof; minimum \$100.00
Temporary Certificate of Occupancy, residential one-family	\$100.00 per dwelling unit
Temporary Certificate of Occupancy, non-residential	\$200.00
Christmas Tree sales lot	\$175.00 per season
Deck, gazebo, dock/pier	\$85.00 for the first 150 square feet of area plus \$20 for each additional 150 square feet of area or fraction thereof.
Demolish or relocate entire residential one-family detached structure	\$300.00
Demolish or relocate entire non-residential structure	\$500.00
Limited demolition, residential one-family detached & attached	\$40.00
Limited demolition, non-residential	\$85.00
Elevator, escalator, dumbwaiter	\$300.00 per car or escalator
Biannual elevator inspection	\$75.00
Fence, dog run	\$45.00
Fireplace	\$45.00
Patio (concrete or pavers)	\$45.00
Public walk, private walk, approach, driveway	\$45.00
Roofing, new & re-roof, residential one-family	\$45.00 per dwelling
Roofing, new & re-roof, non-residential	\$1.50 per 100 square feet of roof area or fraction thereof; \$85.00 minimum
Window, door replacement	\$10.00 per window; minimum \$45.00
Storage shed	\$45.00
Shipping container for temporary storage	On site over 14 consecutive days and no more than 90 consecutive days, \$150.00
Hot tub, spa	\$45.00
Storable, temporary swimming pool	\$45.00 per season
On-ground swimming pool	\$150.00
In-ground swimming pool	\$300.00
Telecommunication/data transmission freestanding tower	\$750.00
Telecommunication/data transmission antenna	\$150.00 per antenna
Fuel dispensing tank installation	\$0.11 per gallon capacity of tank; \$150. Minimum
Underground storage tank removal	\$95.00 per tank
Temporary structure	\$150.00 for the first 90 days plus \$50.00 for each additional 30 days or fraction thereof

Special event (fair, carnival, sidewalk/outdoor sales)	\$95.00 per day
Reinspection	\$45.00 per inspection

<b>Permits, miscellaneous</b>	
<i>Permit extension (Note: All requests for a permit extension shall be made in writing.)</i>	
First 6-month extension	25% of permit fee; \$45 minimum
Second 6-month extension	50% of permit fee; \$45 minimum
Third 6-month extension	100% of permit fee; \$45 minimum
Withdrawn permit	In the event a permit application is reviewed, approved and issued, and the work for which the permit was issued has not been started within six months of issuance, the permit shall be voided. If a permit is withdrawn by the applicant or is revoked or voided by the Village, a portion of the permit fee may be refunded pursuant to a written request from the applicant, the plan review portion of the permit shall be retained by the Village and not refunded, and in no case shall the amount retained be less than \$45.
Work performed without a permit	Penalty of 100% of the permit shall be added to the cost of a permit if construction is started without first obtaining an approved permit.

**Chapter 29, Sign Code:**

	Fee
<b>Section 29.16-B, Permit Fees</b>	
Ground and Freestanding Signs	\$75 base permit fee plus \$2 per square foot of sign face
Wall and Projecting Signs	\$75 per sign
Illuminated Signs	Additional \$60 electrical permit fee per sign
Temporary Signs and Flag Poles	\$40
<b>Section 29.17-E, Confiscated Signs</b>	
Storage	\$25 per sign
<b>Section 29.17-G, Penalties for Erecting Off-Site Subdivision Identification Sign</b>	
Penalty	\$500
<b>Section 29.18, Variations</b>	
Review fee	\$100



**VILLAGE OF ALGONQUIN**  
*COMMUNITY DEVELOPMENT DEPARTMENT*

**– M E M O R A N D U M –**

DATE: October 15, 2020

TO: Committee of the Whole

FROM: Russell Farnum, AICP, Community Development Director

SUBJECT: *Riverview Townhomes Proposal, Case No. 2020-05*

---

Chris Carpenter has petitioned to rezone the property at the northeast corner of Algonquin Road and River Road from “B-1” Business to “O-T” Old Town District, with an accompanying PUD approval for 4 townhomes.

The property is undeveloped and consists of a sloping hillside with several mid-sized maple trees, consisting otherwise mostly of lawn. Properties to the east and north include single family detached homes. To the west is River Road, a vacant lot, and a single family home, an extended-stay hotel, and some properties currently used as boat slip rentals along the Fox River. To the south lies Algonquin Road, and on the other side of the road, Tavern on the Bridge and Algonquin Heating and Air Conditioning.

The petition is requesting zoning to “O-T” Old Town District, in accordance with Chapter 21.06 of the Village zoning ordinance, and approval of an accompanying Plan for the development of 4 townhome units. The units would be three stories in height, with a garage on the ground level and 2 levels of living area above. Sample elevations and floor plan options are included with the backup materials.

The units would face River Road with very nice views of the Fox River, and each unit will have a balcony looking out over the river. The units are placed near the east lot line and tucked into the hillside, which provides space on the site for access via River Road to a small parking area (four additional parking stalls). Each unit has a one-car driveway and a one-car garage, minimum, and possible 2-car drive and 2-car garage. A retaining wall would be placed along the north side of the lot in order to make the grades work for the project with the neighboring property.

The units would be rental units, but with separate utility services, they could be subdivided and sold as separate units in the future. Due to the common parking and other facilities, a condominium declaration or covenants would have to be recorded prior to any sale of the units.

The Comprehensive Plan and the East Side Neighborhood Redevelopment Plan both support commercial uses on this property, primarily due to the property's location adjacent to Algonquin Road. The East Side Plan supports a mixed-use building with 5,000 square feet of retail space and 12 upstairs units, with 36 parking stalls.

This proposal, therefore, does not comply with those recommendations. However, it is considerably less dense than the East Side Plan recommends, but the proposed residential use is more compatible with the nearby single family residential uses than a commercial use of the property. And Staff believes this is a better project than the East Side Plan recommendation because of the layout and the ability to tuck the units into the hillside, minimizing the impact on grading and the use of retaining walls to develop the site.

The Planning and Zoning Commission held a public hearing on this request at their regular meeting of October 12, 2020. No members of the public spoke at the public hearing. The Commission voted unanimously to recommend approval of the proposed rezoning to O-T Old Town, and the accompanying PUD for Riverview Townhomes, subject to the following conditions:

- A. A stormwater retention plan, lighting plan, landscaping plan, and final building elevations shall be provided for Village Board review and approval prior to final Board approval of the request;
- B. The final engineering shall be revised to comply with Algonquin/Lake in the Hills Fire Protection District, Public Works Department and Village Engineer comments;
- C. The final building elevations shall be submitted to the Historic Commission for review and approval prior to any permits being issued for the development of the site;
- D. Any satellite dishes or other appurtenances shall be restricted to the east or north walls, and shall not be visible from Algonquin Road or River Road;
- E. Leases shall be of a minimum term of 12 months and the owner shall include the HUD Crime Free Lease Addendum;
- F. Prior to any sale of individual units on the property, either a condominium declaration or covenants shall be prepared to regulate maintenance and use of common areas, and same shall be submitted to the Village for review and approval;

Committee members should note that Public Works and Village Engineer comments were not received prior to the meeting but have since been incorporated into the conditions, above. Consensus to move this forward for Board approval once the stormwater retention plan, lighting plan, landscaping plan, and final building elevations are provided is recommended.



**VILLAGE OF ALGONQUIN  
PLANNING AND ZONING COMMISSION  
AGENDA**

Regular Meeting  
Monday, October 12, 2020  
7:30 p.m.

Pursuant to Governor Pritzker’s Executive Order No. 2020-07 (COVID-19 Executive Order No. 5), Governor Pritzker has suspended certain rules of the Open Meetings Act – specifically the Executive Order permits remote public meetings. In light of the current COVID-19 public health emergency and the prohibition of public gathering of 10 or more, the Village Board has chosen to conduct various board and commission meetings remotely. The following information is being made available to the public for the purpose of public participation in the spirit of transparency and an open meeting process.

If you would like to listen to and/or participate in the meeting, please go to

<https://algonquin.zoom.us/j/97672014964?pwd=bkN2QlFKTkVvTFliQUJjLzA0VElidz09>

Passcode: 564829

or dial in (877) 853-5257 or (888) 475-4499 webinar ID 976 7201 4964.

If you wish to submit any comment, please contact the Deputy Village Clerk in advance of the meeting at 847-658-5609 or [meetingcomments@algonquin.org](mailto:meetingcomments@algonquin.org) or to comment during the public hearing portion of the meeting after logging into the zoom meeting, please raise your hand and you will be called on, if you are dialing in, dial \*9 to raise your hand.

The Village will read such public comments during the public comment portion of the meeting. Any comments received during the meeting but after the public hearing has ended will be provided in writing to the Planning and Zoning Commission and Village Board members after the meeting.

Remote meetings will be recorded for the purpose of accurate meeting minutes.

1. Roll Call - Establish Quorum
2. Request Approval of Minutes of the August 10, 2020 Meeting (NOTE: February 10, 2020 PZC minutes are not yet prepared)
3. Request for Rezoning from B-1 Business to O-T Old Town, and approval of a Preliminary and Final PUD for Riverview Townhomes  
**Case No. 2020-05. Chris Carpenter**
  - A. Petitioner Comments
  - B. Staff and Commission Questions/Comments
  - C. Public Comment
  - D. Close Public Comment
  - E. Commission Motion On Petition
4. New/Old Business
5. Adjournment

**VILLAGE OF ALGONQUIN**  
**PLANNING AND ZONING COMMISSION**  
**Meeting Minutes**  
**August 10, 2020**

**AGENDA ITEM 1:** Roll Call to Establish a Quorum  
Chair Patrician called the meeting to order at 7:33 pm.

Farnum called the roll, Commissioners present were: Hoferle, Patrician, Sturznickel, and Szpekowski. Commissioners absent were Laipert, Postelnick and Neuhalfen.

*Note: Commissioner Neuhalfen was present but could not be heard when speaking. His votes are recorded as absent for the record, since he could not be heard.*

Staff Members present were: Russ Farnum, Community Development Director, and Brandy Quance, Village Attorney.

Before beginning regular business, Chair Patrician noted this was a virtual meeting and introduced Village Attorney Brandy Quance to provide an overview of the protocols for the meeting.

Quance noted the Village has determined in light of book open emergency and the Governor's gubernatorial order and the Village continuation of proclamation of local disaster, the Village President and the Chair of the Planning and Zoning Commission have determined that an in person meeting is not practical so we are holding this meeting remotely.

The Community Development Director is physically present at the regular meeting location. Quance asked that Commissioners confirm that they can hear all the other members as well as the petitioners so we'll just do that at the roll call notes for the public hearing.

**AGENDA ITEM 2:** Approval of Minutes from the July 13, 2020 Meeting.

Chair Patrician asked for a motion to approve the minutes of the July 13, 2020 meeting. Patrician noted the minutes from the February meeting were not prepared yet and would be ready at the next meeting.

Commissioner Sturznickel made a motion, seconded by Hoferle, to approve the minutes. Motion passed by roll call vote, 4-0-3 (Hoferle, Patrician, Sturznickel, and Szpekowski Aye, Laipert, Postelnick, Neuhalfen Absent).

**AGENDA ITEM 3:** Request for Final PUD and Final Plat Approval, Phases 1 and 2, Trails of Woods Creek

**Case No. 2020-04 Pulte Home Corp. LLC**

Petitioner: Patti Bernhard, Attorney, and Matt Brolley for Pulte Homes

Patrician asked Farnum for clarification that this was not a public hearing. Farnum confirmed that the Public Hearing had already been held and the zoning for this project granted. This was a follow up action by the Commission.

Patrician asked for the petitioners to present their case and comments. Patti Bernhard, Attorney representing Pulte, introduced herself and presented the project. Matt Brolley introduced himself

and noted several of their other design professionals were present to address any questions the Commission may have.

Bernhard noted the zoning and preliminary plats were approved by the Village Board in May and Pulte was now seeking approval of the final plats and plan. The Final Plan and Plats are in conformity with the preliminary plans. The project would be built in 2 phases, with 149 homes in the first phase and 129 homes in the second. All open space would be part of the first phase. Pulte is seeking the affirmative recommendation of the Plan Commission to move forward for approval by the Village Board.

Bernhard noted there were changes to the approved Preliminary that the Board required after the Plan Commission had taken action. She outlined a few of the changes which included removal of the commercial parcel and it worked out well for Pulte and the Village. Pulte will add traffic calming on Fairway View Drive, and the wetlands will be enhanced with 35 acres of overall public park space to be deeded to the Village. Pulte anticipates starting the project yet this fall, and having model homes opening in March 2021.

Chair Patrician thanked Bernhard for the presentation, and asked Farnum for some background. Farnum noted the submission was extensively reviewed by Staff and the review comments were in the Commission packet. There were several changes in the plan that occurred after the Commission had already reviewed the Preliminary PUD, which the Committee of the Whole reviewed twice with substantial more public input. Farnum noted Pulte has been cooperative in planning their project throughout the entire process, then returning with a plan that fulfilled all of the prior conditions of approval.

Farnum noted that Pulte had provided covenants and an HOA, but a backup SSA would still be required. The Public Works Department, Village Engineer, McHenry Division of Transportation, Fire Department, and Village planners had reviewed the submittals and had technical changes but recommended approval subject to five conditions outlined in the Staff Report, including final street names were subject to review and approval by the Fire Department and Village Public Works Department; no work begins prior to appropriate permits being issued; and the developers otherwise comply with the development agreement, and the approved preliminary plan and plats for the Trails of Woods Creek project.

Patrician asked if there were any Commission comments. Hoferle asked why delete the commercial parcel for more residential units. Brolley explained the neighbors had concerns over that use and it worked out better for Pulte and the Village to add five lots there for the model homes. Hoferle asked if the traffic calming would be speed bumps. Brolley explained it would be narrowing the street dramatically at the bike path crossing with brick pavers, similar to Bunker Hill Drive. Hoferle asked for selling prices, Brolley noted they are not finalized yet but generally the Shores would be starting at mid to high 200's and hopefully selling in the low to mid 300's; the Springs would be starting at 350 and closing upwards of 400, and the Estates would be selling around 450.

Sturznicke asked how the flooding at the southwest end of the property was being addressed. Brolley introduced engineer Anthony Falkowski of Cemcon who explained the additional

stormwater volume and elimination of constrictions downstream would help get the water out of that area faster. Farnum added the enhanced wetlands and overall drainage system would alleviate that flooding without flooding new land downstream to the east of Fairway View Drive or into Woods Creek.

Sturznickel noted he was glad to see the fences were being replaced on those properties that would lose their fences.

Szpekowski asked if there were to be three separate homeowners associations, or just one. Brolley noted there would be one association with jurisdiction over all three neighborhoods.

Szpekowski asked about the Algonquin Road crossing. Brolley noted it would be a crosswalk with pedestrian signals that ties the trails into the trail north of Algonquin Road. Szpekowski asked about the size of the tree replacements, Brolley introduced their Landscape Architect, Sharon Dickson, who noted the shade trees would be 3" diameter and the decorative or evergreens would be 6 to 8 feet tall. Per Village requirements there would be a large variety of trees, both fast and slow growing, that would be planted throughout the development.

Chair Patrician asked if Commissioner Neuhalfen had any comments. Hearing nothing, Patrician asked if the properties east of the entrance to Frank Road were included and what was planned for them. Brolley clarified those parcels were owned by others and were not part of the project.

With no other Commission questions or input, Chair Patrician asked for public comments. No one raised their hand nor asked to participate. Farnum confirmed no participants had raised their hand.

Patrician asked for a motion on case 2020-04. Sturznickel moved for approval of the request for Final PUD and Final Plats for Phase 1 and Phase 2 of TRAILS OF WOODS CREEK, consistent with the petition submitted by the developer, and the conditions recommended by staff. Second by Hoferle.

Patrician called for a roll call vote, which Farnum called. Motion passed by roll call vote, 4-0-3 (Hoferle, Patrician, Sturznickel, and Szpekowski Aye, Laipert, Postelnick, Neuhalfen Absent).

Chair Patrician called for Old/New Business. Hoferle asked about the status of the downtown project construction, noting LaFox River Drive had a lot going on. Farnum provided an update and noted part of the project includes all new water mains and a new gravity sanitary sewer line that will go all way to the WWTF, and help the Village eliminate several lift stations that are maintenance issues. Farnum noted the project was on schedule but the Village had several years of overall work left.

There being no other business, Patrician asked for a motion to adjourn. Sturznickel moved, second by Szpekowski, to adjourn the meeting. Motion passed by roll call vote, 4-0-3 (Hoferle, Patrician, Sturznickel, and Szpekowski Aye, Laipert, Postelnick, Neuhalfen Absent). Patrician declared the meeting adjourned at 8:17 pm.



**VILLAGE OF ALGONQUIN**  
*COMMUNITY DEVELOPMENT DEPARTMENT*

**- M E M O R A N D U M -**

DATE: October 9, 2020

TO: Planning and Zoning Commission

FROM: Russell Farnum, AICP, Community Development Director

SUBJECT: *Case No. 2020-05, Rezone "B-1" to "O-T" Old Town, and PUD approval, Riverview Townhomes*

---

Chris Carpenter has petitioned to rezone the property at the northeast corner of Algonquin Road and River Road from "B-1" Business to "O-T" Old Town District, with an accompanying PUD approval for 4 townhomes. The site plan and related documents are attached.

**Overview of the Property**

The property is undeveloped and consists of a sloping hillside with several mid-sized maple trees, consisting otherwise mostly of lawn. Properties to the east and north include single family detached homes. To the west is River Road, a vacant lot, and a single family home, an extended-stay hotel, and some properties currently used as boat slip rentals along the Fox River. To the south lies Algonquin Road, and on the other side of the road, Tavern on the Bridge and Algonquin Heating and Air Conditioning.

The property has approximately 105 feet of frontage on River Road and is 132 feet deep, with a net area of just under 14,000 square feet, or about a third of an acre. The only access to the property would be by River Road, as no access to Algonquin Road would be allowed. The property is in a thin strip of land along Algonquin Road that is designated Retail on the 2008 Comprehensive Plan update. The property was considered a





mixed-use possibility in the “East Side Neighborhood Redevelopment Plan” concept prepared in 2007.

### **Petitioner’s Request**

The petition is requesting zoning to “O-T” Old Town District, in accordance with Chapter 21.06 of the Village zoning ordinance, and approval of an accompanying Plan for the development of 4 townhome units. The units would be three stories in height, with a garage on the ground level and 2 levels of living area above. Sample elevations and floor plan options are included with the backup materials.

The units would face River Road with very nice views of the Fox River, and each unit will have a balcony looking out over the river. The units are placed near the east lot line and tucked into the hillside, which provides space on the site for access via River Road to a small parking area (four additional parking stalls). Each unit has a one-car driveway and a one-car garage, minimum, and possible 2-car drive and 2-car garage. A retaining wall would be placed along the north side of the lot in order to make the grades work for the project with the neighboring property.

The units would be rental units, but with separate utility services, they could be subdivided and sold as separate units in the future. Due to the common parking and other facilities, a condominium declaration or covenants would have to be recorded prior to any sale of the units.

### **Discussion**

#### **Compliance with the Comprehensive Plan and other Planning Documents**

The Comprehensive Plan and the East Side Neighborhood Redevelopment Plan both support commercial uses on this property, primarily due to the property’s location adjacent to Algonquin Road. The East Side Plan supports a mixed-use building with 5,000 square feet of retail space and 12 upstairs units, with 36 parking stalls.

This proposal, therefore, does not comply with those recommendations. However, is considerably less dense than the East Side Plan would recommend. Further, it is doubtful that the recommendation of a mixed-use building is feasible at this location, due to the constrained access, the steep hillside, and the grading that would be necessary to fit all of the parking and the building pad on this site. Lastly, the residential use is more compatible with the nearby single family residential uses than a commercial use of the property.

And although it is wholly residential, Staff believes this is a better project than the East Side Plan recommendation because of the layout and the ability to tuck the units into the hillside, minimizing the impact on grading and the use of retaining walls.

## **Compliance with the Zoning Ordinance**

This project complies with the regulations of the O-T Old Town District, except for the provisions of:

Section C Allowed Uses, Paragraph 6, which limits dwelling units above the ground floor as secondary uses to primary commercial and office uses; and

Section K Parking Regulations, Paragraph 2 Parking Lot Design Standards, subparagraph c, which states that no parking shall be allowed in the front yard.

In this case, should the Planning and Zoning Commission wish to recommend approval of the project, the PUD zoning would include a provision that the residential dwellings would be allowed on the ground floor, and that the small amount of parking would be allowed in the front yard. These provisions would be based upon findings that this site is not practical or feasible for commercial uses, and that the layout better uses the grades of the property if the parking is in the front yard.

Chapter 21.11 Planned Developments, Paragraph B, states specifically “Any redevelopment project within the O-T District, as defined and regulated in Sections 21.3 and 21.6 herein, shall be considered a planned development.” This request complies with that requirement.

## **Utilities and Engineering**

As of the preparation of this packet, CD Staff has not received Public Works nor Engineering comments on this request. It is noted that the submittal has some deficiencies, including the following:

1. No stormwater retention calculations nor facilities have been provided as part of the engineering submittal;
2. No lighting plan nor photometric study has been provided;
3. No landscaping plan has been provided.

While these are typically submitted as part of most PUD requests, this is a relatively small development request that varies from the Village Plan. It would make little sense to require those expensive documents to be submitted at this time, until it is known how the Planning and Zoning Commission and Village Board will act on the rezoning request.

## **Tree Preservation and Landscaping**

As noted in the Overview of the Property, above, there are a handful of maple trees on the site, most appear to be volunteer trees that have grown up over time. There was no tree survey done but the developer would be required to pay the tree replacement fees as all of the trees would be removed as part of this project.

The landscape plan would be required before final approval of permits. The site does allow a lot of room for a very nice landscaping presentation.

### **Historic Commission Approval**

Again, without knowing if the rezoning would be given an affirmative vote by the Planning and Zoning Commission and Village Board, the building elevations have not yet been reviewed by the Historic Commission. They will be processed through the Historic Commission if the rezoning is approved, and prior to construction.

### **Public Input**

One note of support has been received from a neighboring property owner, Carl Swanson. It is included with the packet. Based upon prior petitions on other nearby properties, Community Development Staff expects other nearby neighbors to object to the proposal.

### **Finding of Fact and Recommendation**

Based upon this review, it is recommended the Commission make the following findings:

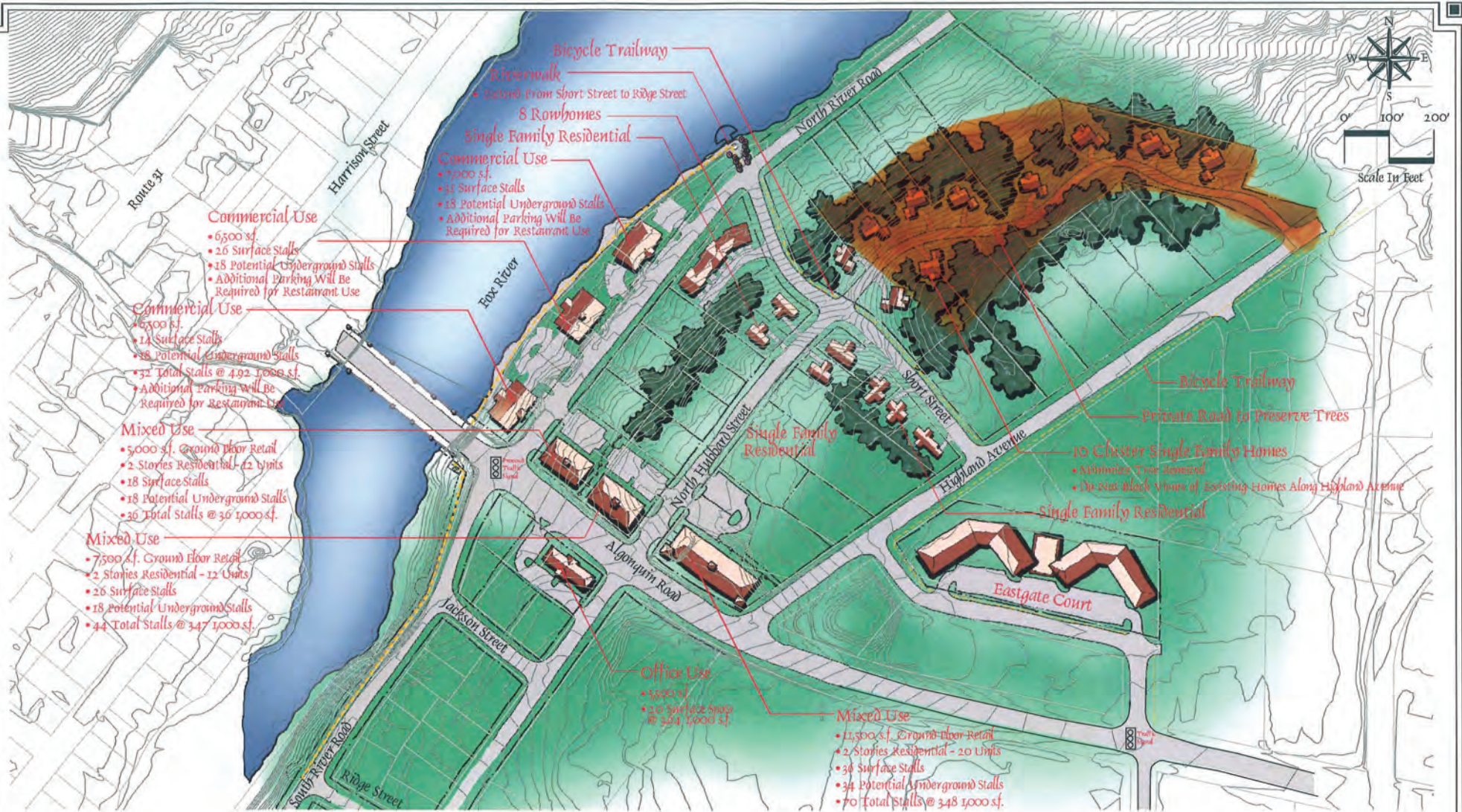
1. The proposed use is appropriate and desirable in this location, makes better use of the property, and will be more compatible with the surrounding uses than the commercial uses designated on the Comprehensive Plan, or the high density mixed use building proposed on the East Side Neighborhood Redevelopment Plan.
2. The petitioner's proposed development will provide a variety of desirable housing options for the local community, and additional residents to support the downtown and the east side commercial areas.
3. The proposed use of this site complies with the Village Zoning Ordinance, and will not be detrimental to the health, safety, morals or general welfare of persons residing or working in the vicinity, or injurious to property values. Similar to other Planned Unit Developments throughout the Village, the petitioner's development shall both be constructed in accordance with the approved plans and adhere to the conditions of approval regulating architectural design and site layout, in order to be compatible with surrounding development.
4. The proposed uses will comply with all zoning requirements of the Village and the conditions stipulated as part of the approval.

Based upon these findings, Community Development Staff recommend approval of the proposed rezoning to O-T Old Town, and the accompanying PUD for Riverview Townhomes, subject to the following conditions:

- A. A stormwater retention plan, lighting plan, landscaping plan, and final building elevations shall be provided for Village Board review and approval prior to final Board approval of the request;



- B. The final engineering shall be revised to comply with Algonquin/Lake in the Hills Fire Protection District comments;
- C. The final building elevations shall be submitted to the Historic Commission for review and approval prior to any permits being issued for the development of the site;
- D. Any satellite dishes or other appurtenances shall be restricted to the east or north walls, and shall not be visible from Algonquin Road or River Road;
- E. Leases shall be of a minimum term of 12 months and the owner shall include the HUD Crime Free Lease Addendum;
- F. Prior to any sale of individual units on the property, either a condominium declaration or covenants shall be prepared to regulate maintenance and use of common areas, and same shall be submitted to the Village for review and approval;
- G. Additional conditions may be added upon receipt of Public Works and Village Engineer review comments.



© 2007 Tetra Tech

# East Side Neighborhood Redevelopment Plan

Algonquin, Illinois

Revised: 8 August 2007

Designed By





From: Carl Swanson <office@cjscpa.com>  
Date: September 29, 2020 at 12:24:11 PM CDT  
To: Chris Carpenter <chriscarpenter.onehour@gmail.com>  
Cc: Carl Swanson <office@cjscpa.com>  
Subject: NEW TOWNHOMES AT ALGONQUIN & NORTH RIVER RD.

To Chris Carpenter: Please present this email to the Village of Algonquin.

To the Algonquin Board of Trustees and Village Staff:

I am a resident at 1901 N River Road since 1993; a period of approximately 27 years. I am very supportive of the development of townhomes on the parcel at the NEC of Algonquin & N River Rd. This is an excellent use for this parcel. It is my understanding that these units will be rentals with the possibility of selling the units in the future. The opportunity for new residents or existing residents to be offered the choice for a new construction rental townhome is a unique market option needed at this time.

I fully support that the Village embraces this new development and cooperates with Chris Carpenter in providing the needed zoning and construction approvals, including TIF assistance and reimbursements.

Please contact me if you have any further questions.

Thank you,

Carl Swanson  
1901 N River Road  
Algonquin, Illinois 60102

[REDACTED]  
[REDACTED]

Email: office@cjscpa.com

# Algonquin-Lake in the Hills Fire Protection District Fire District Memorandum



DATE: September 28, 2020  
TO: Russ Farnum, Community Development Director, Village of Algonquin  
FROM: Cory Pikora, Fire Prevention Director Algonquin- LITH FPD  
RE: Riverview Townhomes

---

Thank you for providing the preliminary drawings for the purposed Aldi 37 Store on Randal Rd.

## **Overall Site Comments:**

- Provide an emergency vehicle access plan using the turning radius schematic provided for the Algonquin Lake in the Hills Fire Protection District Tower Ladder Truck. This access plan should include all driveways / roadways of the property. **IFC 503.2.4 Turning Radius**
- All fire department access roads shall be a minimum of 20 feet of unobstructed width and 13'6" of unobstructed height. **IFC 503.2.1 Dimensions**
- Mark the west curb line and entrance to the complex as "No Parking Fire Lane" with either fire lane signage or curb paint. **IFC 503.3 Marking**

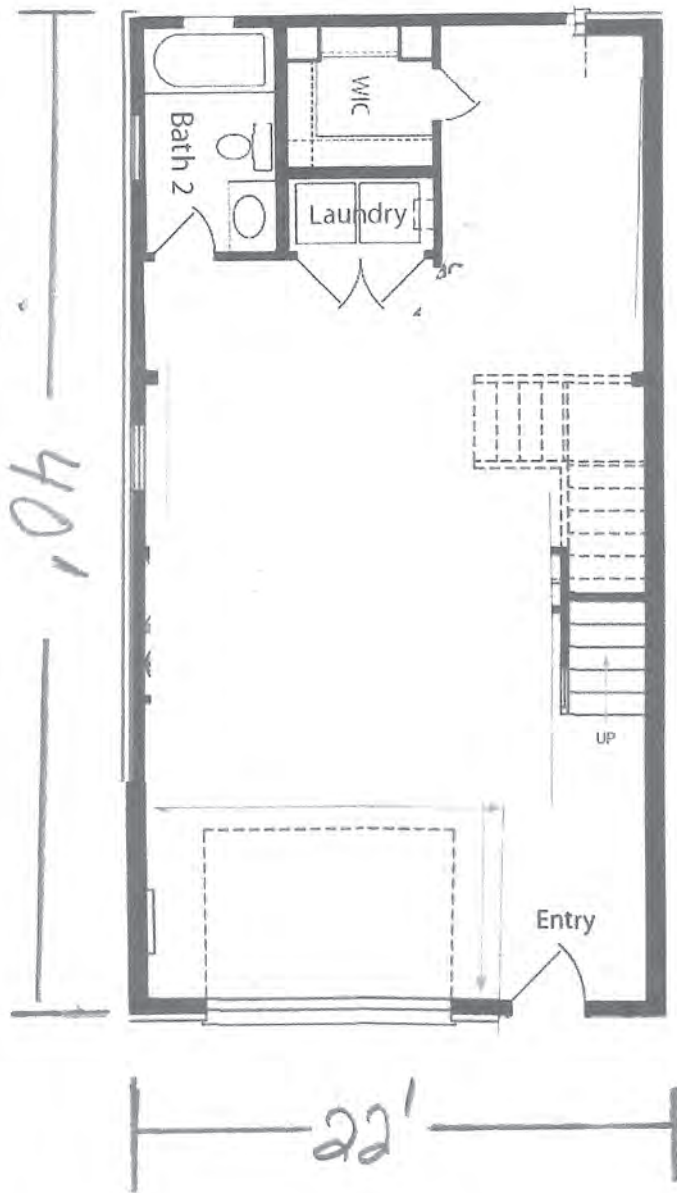
## **General Building Comments:**

- You indicated you will be looking to have a fire sprinkler system installed within the townhomes. In looking at the 2018 IBC, the townhomes will be allowed to be a NFPA 13D sprinkler systems. This will not require a fire department connection for the townhomes.

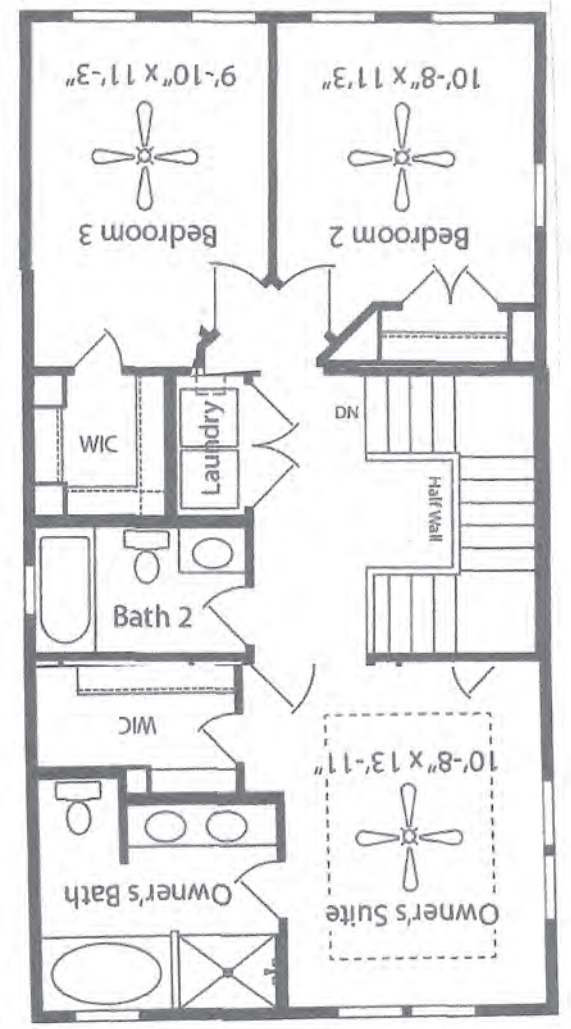
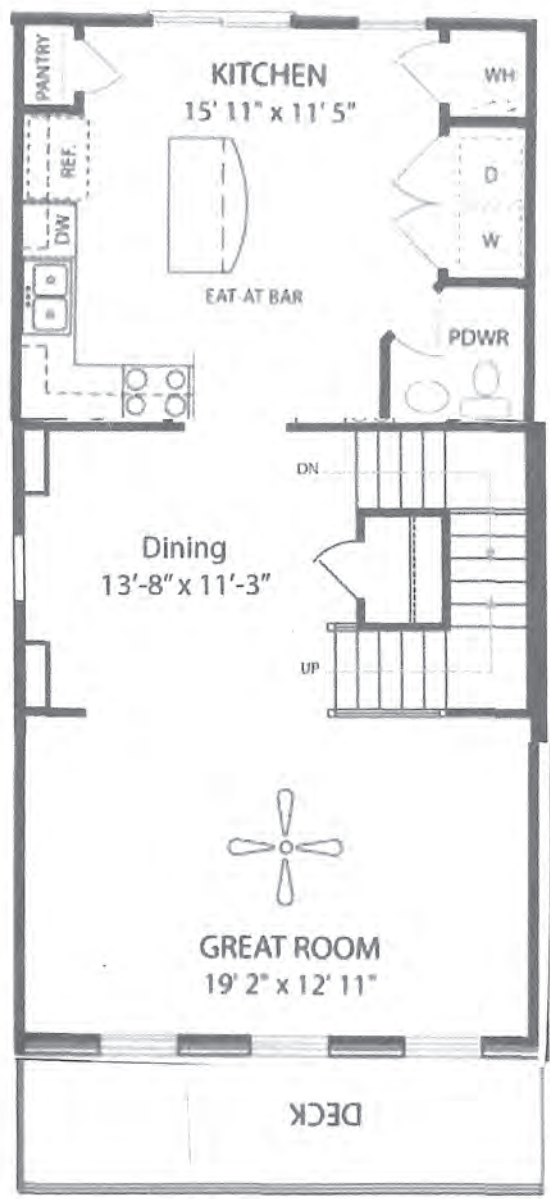
Should you have any questions on my comments, please feel free to contact me.

Cory Pikora  
Fire Prevention Director  
Algonquin-Lake in the Hills Fire Protection District



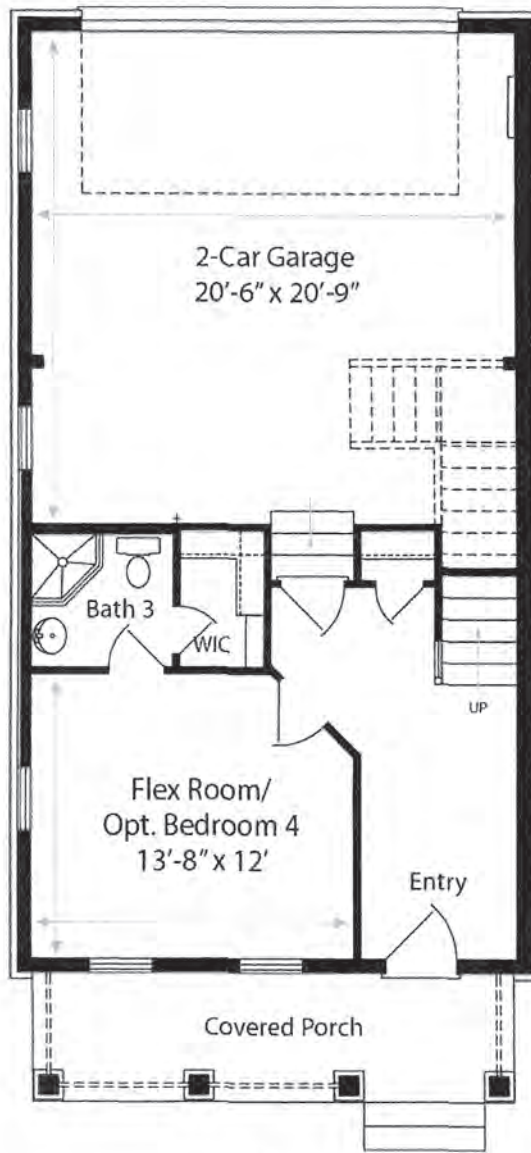


First Level

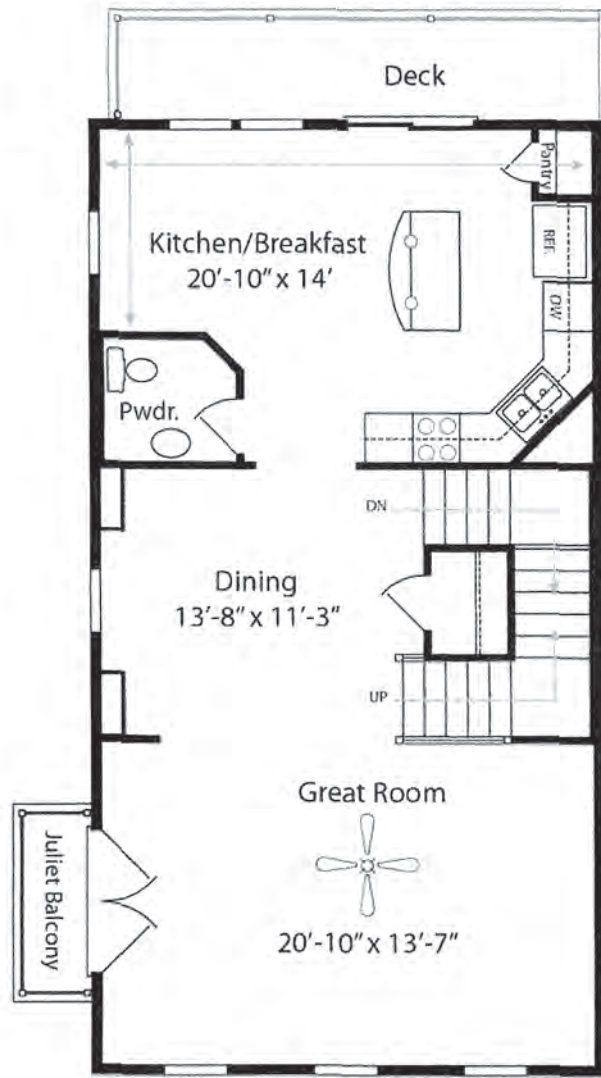


Third Level

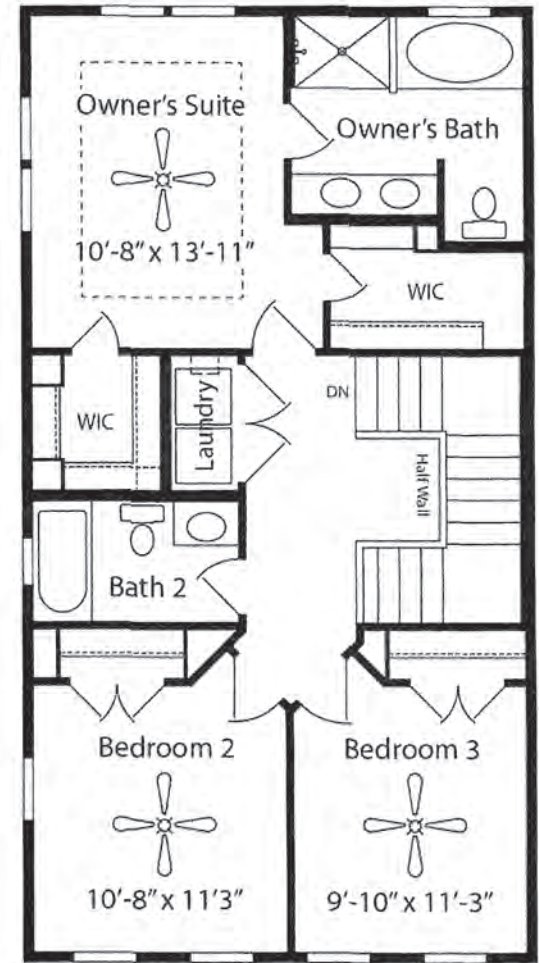




First Level



Second Level



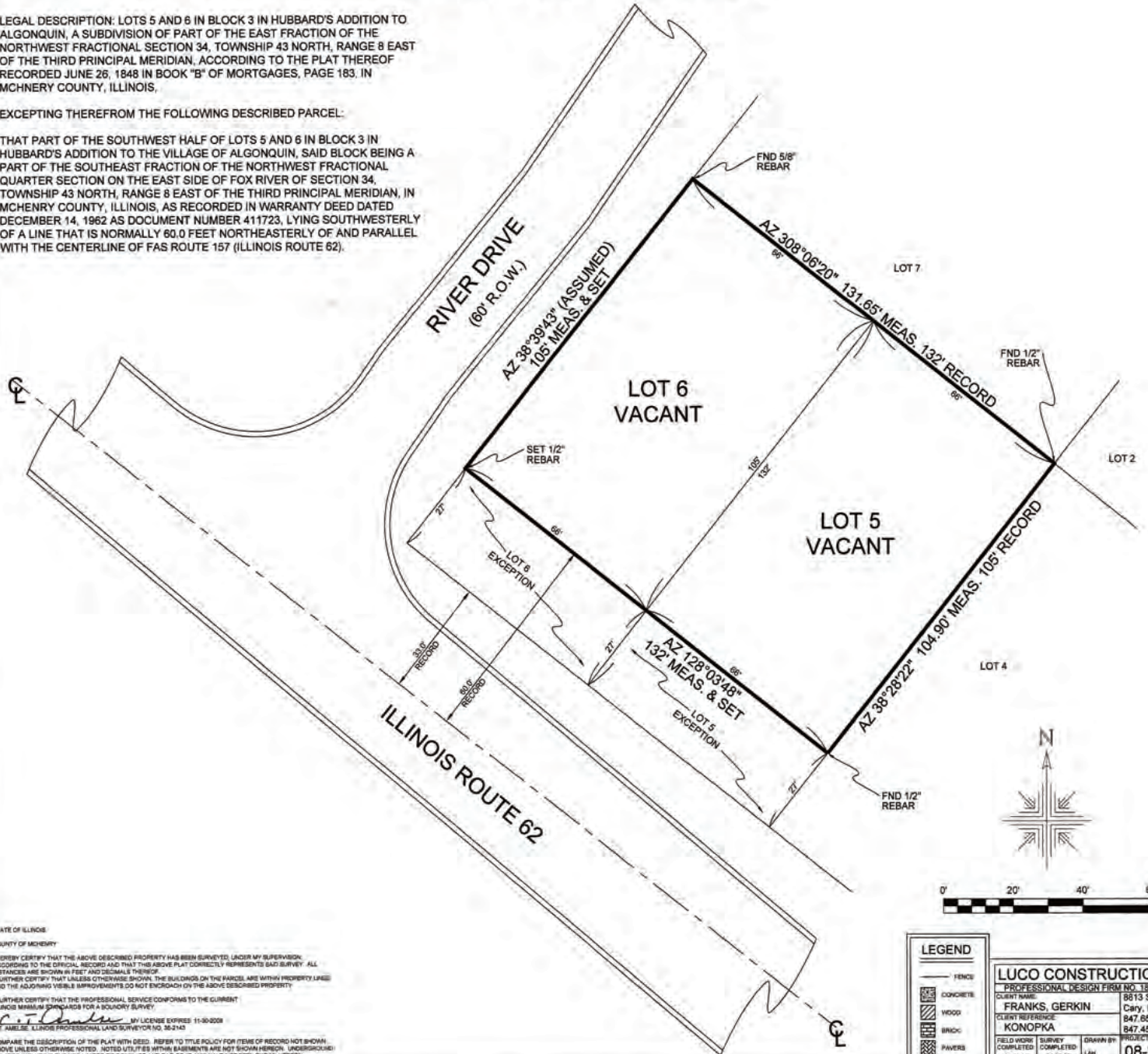
Third Level

# PLAT OF SURVEY

LEGAL DESCRIPTION: LOTS 5 AND 6 IN BLOCK 3 IN HUBBARD'S ADDITION TO ALGONQUIN, A SUBDIVISION OF PART OF THE EAST FRACTION OF THE NORTHWEST FRACTIONAL SECTION 34, TOWNSHIP 43 NORTH, RANGE 8 EAST OF THE THIRD PRINCIPAL MERIDIAN, ACCORDING TO THE PLAT THEREOF RECORDED JUNE 26, 1848 IN BOOK "B" OF MORTGAGES, PAGE 183, IN MCHENRY COUNTY, ILLINOIS.

EXCEPTING THEREFROM THE FOLLOWING DESCRIBED PARCEL:

THAT PART OF THE SOUTHWEST HALF OF LOTS 5 AND 6 IN BLOCK 3 IN HUBBARD'S ADDITION TO THE VILLAGE OF ALGONQUIN, SAID BLOCK BEING A PART OF THE SOUTHWEST FRACTION OF THE NORTHWEST FRACTIONAL QUARTER SECTION ON THE EAST SIDE OF FOX RIVER OF SECTION 34, TOWNSHIP 43 NORTH, RANGE 8 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN MCHENRY COUNTY, ILLINOIS, AS RECORDED IN WARRANTY DEED DATED DECEMBER 14, 1962 AS DOCUMENT NUMBER 411723, LYING SOUTHWESTERLY OF A LINE THAT IS NORMALLY 60.0 FEET NORTHEASTERLY OF AND PARALLEL WITH THE CENTERLINE OF ILLINOIS ROUTE 157 (ILLINOIS ROUTE 62).



LEGEND	
	FENCE
	CONCRETE
	WOOD
	BRICK
	PAVERS

LUCO CONSTRUCTION CO.	
PROFESSIONAL DESIGN FIRM NO. 154 004820	
CLIENT NAME:	FRANKS, GERKIN
CLIENT REFERENCE:	KONOPKA
FIELD WORK COMPLETED:	01-25-08
SURVEY COMPLETED:	01-28-08
DRAWN BY:	LJH
PROJECT NO.:	08-23010

STATE OF ILLINOIS  
 COUNTY OF MCHENRY

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED PROPERTY HAS BEEN SURVEYED UNDER MY SUPERVISION, ACCORDING TO THE OFFICIAL RECORDS AND THAT THIS ABOVE PLAT CORRECTLY REPRESENTS SAID SURVEY. ALL DISTANCES ARE SHOWN IN FEET AND DECIMALS THEREOF.

I FURTHER CERTIFY THAT UNLESS OTHERWISE SHOWN, THE BUILDINGS ON THE PARCELS ARE WITHIN PROPERTY LINES AND THE ADJOINING VISIBLE IMPROVEMENTS DO NOT ENCROUGH ON THE ABOVE DESCRIBED PROPERTY.

I FURTHER CERTIFY THAT THE PROFESSIONAL SERVICE CONFORMS TO THE CURRENT ILLINOIS MINIMUM STANDARDS FOR A SURVEY SURVEY.

*[Signature]*  
 C.T. AMBLE, ILLINOIS PROFESSIONAL LAND SURVEYOR NO. 362143, MY LICENSE EXPIRES 11-30-2009

COMPARE THE DESCRIPTION OF THE PLAT WITH DEED. REFER TO TITLE POLICY FOR ITEMS OF RECORD NOT SHOWN ABOVE UNLESS OTHERWISE NOTED. NOTED UTILITIES WITHIN EASEMENTS ARE NOT SHOWN HEREON. UNDERGROUND UTILITIES INCLUDING BUT NOT LIMITED TO CONDUITS AND CABLES (IF ANY) HAVE NOT BEEN SHOWN HEREON. VOID WITHOUT RAISED SEAL OR RED STAMP.



# FINAL ENGINEERING PLANS

## FOR

# RIVERVIEW TOWNHOMES

### RIVER & ALGONQUIN ROADS ALGONQUIN, ILLINOIS

## DEVELOPER

CHRIS CARPENTER  
316 MERRY OAKS DRIVE  
SYCAMORE, IL 60178-0459  
P# (815) 739-0459  
CHRISCARPENTER.ONEHOUR@GMAIL.COM

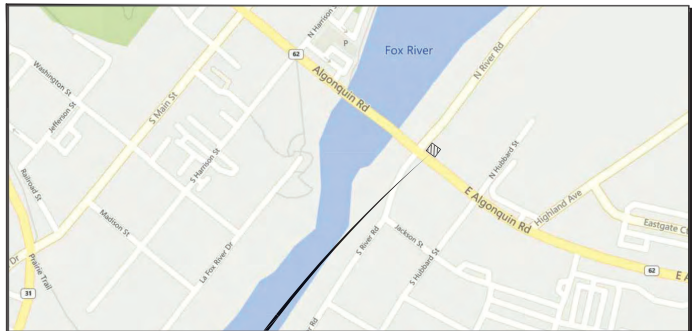
## INDEX OF SHEETS

C100	TITLE SHEET
C200	DEMOLITION PLAN
C300	SITE LAYOUT PLAN
C400	GRADING PLAN
C500	UTILITY PLAN
C600	EROSION AND SEDIMENT CONTROL PLAN
C700	SPECIFICATIONS
C800	CONSTRUCTION DETAILS
C801	CONSTRUCTION DETAILS

NOT FOR CONSTRUCTION  
FOR REVIEW PURPOSES ONLY

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
SANITARY SEWER	—○—	—○—
COMBINED SEWER	—○—	—○—
STORM SEWER	—○—	—○—
UNDERDRAIN	—○—	—○—
WASTEWATER	—○—	—○—
GAS	—○—	—○—
TELEPHONE	—○—	—○—
CABLE TV	—○—	—○—
ELECTRIC	—○—	—○—
OVER HEAD WIRE	—○—	—○—
CURB	—○—	—○—
FENCE	—○—	—○—
STORM OVERFLOW OR MANHOLE OPEN LID STRUCTURE	○	○
SANITARY MANHOLE OR STORM MANHOLE	○	○
INLET, FIRE HYDRANT, VALVE	○	○
ELEVATIONS	x XXX.XX	XXXX.XX
TOP OF CURB	x XXX.XX	XXXX.XX
EDGE OF PAVEMENT	x XXX.XX	XXXX.XX
GEOMETRIC COORDINATE	○○○	○○○
LIGHTS	—○—	—○—
DRAINAGE ARROWS	—○—	—○—
SEWER CLEANOUT	○	○
WATER METER VAULT	—○—	—○—
UTILITY POLE	—○—	—○—
SOIL BORINGS	N/A	—○—
TRAFFIC SIGN	—○—	—○—
TRAFFIC ARROW	—○—	—○—
PARKING STALL COUNT	—○—	—○—
TREE	—○—	—○—
RELOCATE TREE	—○—	—○—
ITEM REMOVAL	X	N/A
PAVEMENT REMOVAL	—○—	N/A
CONCRETE	—○—	—○—
WETLAND	—○—	—○—
LIMITS OF CONSTRUCTION		
MAIL BOX	□	FOUND CONCRETE MONUMENT
TRAFFIC SIGNAL BOX	□	SET CONCRETE MONUMENT
TRAFFIC SIGNAL	○	MEASURED
TELEPHONE BOX	○	RECORD/DEED
GUY WIRE	—○—	POINT OF COMMENCEMENT
FOUND IRON PIPE	○	POINT OF BEGINNING
SET IRON PIPE	○	ARC
FOUND IRON ROD	○	RADIUS
SET IRON ROD	○	CHORD BEARING
FOUND CUT CROSS	+	POINT OF CURVATURE
SET CUT CROSS	+	POINT OF TANGENCY
FOUND P.I.C. NAIL	▲	TOP OF FOUNDATION
SET P.I.C. NAIL	▲	FINISHED FLOOR
TOP OF CURB	T/C	EDGE OF PAVEMENT

ALL DIMENSIONS, COORDINATES, AND PROPOSED GRADES ARE REFERENCED TO THE EDGE OF PAVEMENT UNLESS INDICATED OTHERWISE. OPEN SYMBOLS AND DASHED LINES INDICATE EXISTING CONDITIONS.



PROJECT LOCATION

### LOCATION MAP

LOCATED IN THE NE 1/4 OF SECTION 34, T 43 N, R 8 E

### BENCHMARKS

CONTROL BENCHMARK: VILLAGE OF ALGONQUIN BENCHMARK #44; PLUG ON HANDRAIL OF BRIDGE OVER FOX RIVER AT INTERSECTION OF RIVER DRIVE AND ALGONQUIN ROAD (RT 62) AT NORTHWEST CORNER INTERSECTION. ELEVATION: 764.355

JOB BENCHMARK: NORTHEAST HEADSLOT OF HYDRANT 80± NORTHWEST OF NORTHWEST CORNER SITE. ELEVATION: 758.71

CALL JULIE TOLL FREE  
1(800)892-0123  
EMERGENCY 24 HOURS A  
DAY 365 DAYS A YEAR



CALL  
1(800)892-0123  
48 HOURS BEFORE  
YOU DIG

### DUTY TO INDEMNIFY

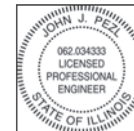
THE CONTRACTOR SHALL DEFEND, INDEMNIFY, KEEP AND SAVE HARMLESS THE MUNICIPALITY, DEVELOPER, AND ENGINEER, AND THEIR RESPECTIVE BOARD MEMBERS, REPRESENTATIVES, AGENTS AND EMPLOYEES, IN BOTH INDIVIDUAL AND OFFICIAL CAPACITIES, AGAINST ALL SUITS, CLAIMS, DAMAGES, LOSSES AND EXPENSES, INCLUDING ATTORNEY'S FEES, CAUSED BY, ARISING OUT OF OR INCIDENTAL TO, THE PERFORMANCE OF THE WORK UNDER THE CONTRACT BY THE CONTRACTOR OR ITS SUBCONTRACTORS TO THE FULL EXTENT AS ALLOWED BY THE LAWS OF THE STATE OF ILLINOIS AND NOT BEYOND ANY EXTENT WHICH WOULD RENDER THESE PROFESSIONS JOB OR UNEMPLOYABLE. THIS OBLIGATION INCLUDES BUT IS NOT LIMITED TO, THE ILLINOIS LAWS REGARDING STRUCTURAL WORK (IL REV. STAT. CH. 48, PAR. 80 AT SEC.), AND REGARDING THE PROTECTION OF ADJACENT LANDOWNERS (IL REV. STAT. CH.17 1/2 PAR.21 ET. SEC.). IN THE EVENT OF ANY SUCH INJURY (INCLUDING DEATH) OR LOSS OR DAMAGE, OR CLAIM THEREOF, THE CONTRACTOR SHALL GIVE PROMPT NOTICE TO THE OWNER.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS & METHODS OF CONSTRUCTION AND FOR PROVIDING AND MAINTAINING ADEQUATE SIGNS, BARRICADES, FENCING, TRAFFIC CONTROL DEVICES AND MEASURES, AND ALL OTHER MEASURES THAT ARE NECESSARY TO PROTECT THE SAFETY OF THE SITE AT ALL TIMES.

NOTES:

NO. DATE SEAL REVISIONS/ISSUANCES

SITING WORKS (847) 921-2390  
423 RAMBLEWOOD, STE. A jst11@yahoo.com  
OLEN ELLYN, IL 60137



EXPIRES 1-31-2021

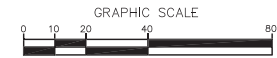
PROJECT NUMBER:  
PROJECT MANAGER: JJP  
ARCHITECT: JJP  
SCALE:  
DATE: XX/XX/2020  
CHECKED BY: JJP

TITLE SHEET

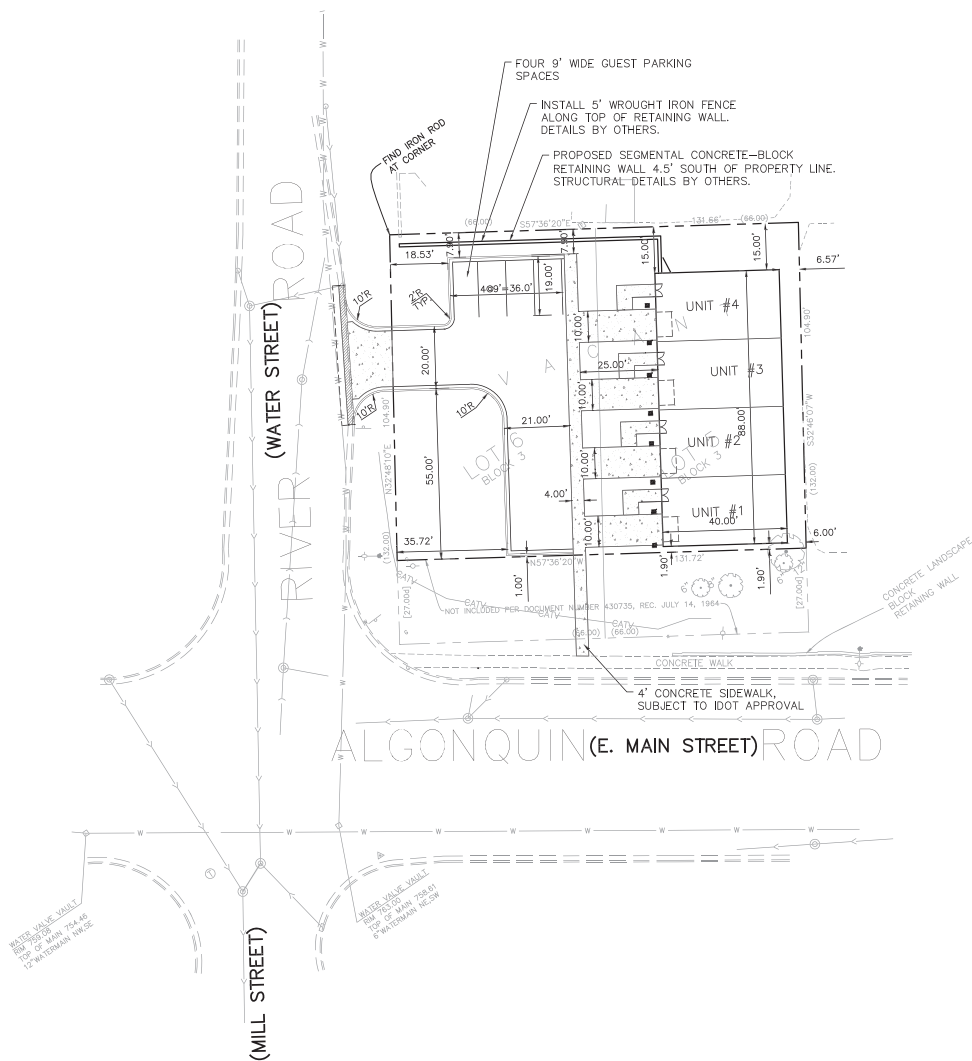
C100



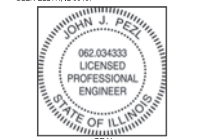
NOTES:



PROJECT DATA	
LAND AREA	= 13,814 SF = 0.3171 ACRES
BUILDING AREA	= 3,520 SF
PROPOSED IMPERVIOUS AREA	= 8,355 SF
PARKING: 1 PER TOWNHOME	= 4
GUEST PARKING	= 4
	8 TOTAL
LIGHTING:	WALL MOUNTED LIGHTS (4) ON GARAGES



NO.	DATE	REVISIONS/ISSUANCES
1	XX/XX/20	XXXX

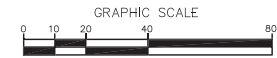


PROJECT NUMBER:	
PROJECT MANAGER:	JJP
ARCHITECT:	JJP
SCALE:	
DATE:	XX/XX/2020
CHECKED BY:	JJP

**SITE LAYOUT PLAN**

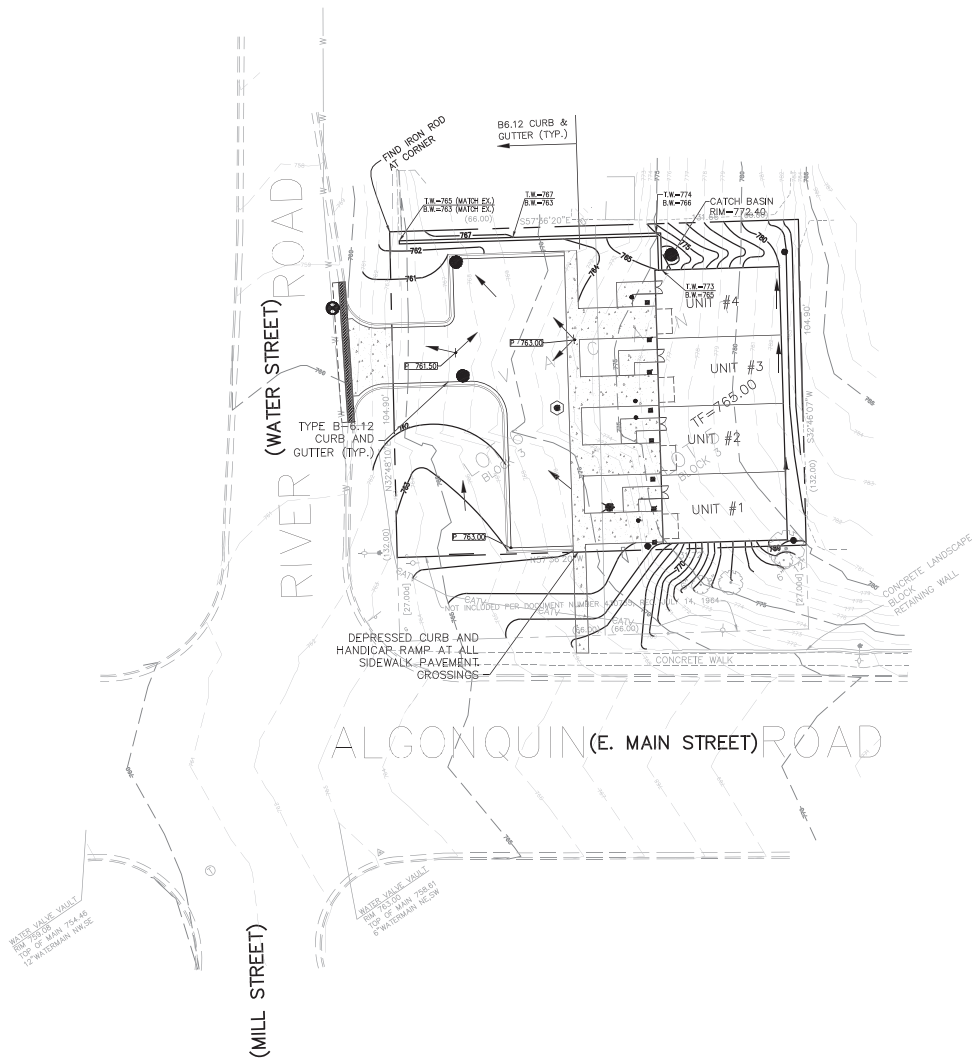
C300

NOTES:



- LEGEND:
- TW = TOP OF WALK
  - TC = TOP OF CURB
  - P = PAVEMENT
  - G = GROUND
  - M/E = MATCH EXISTING
  - P 78.100** = PROPOSED ELEVATION

- NOTES:
1. ADJUST EXISTING STRUCTURES AS REQUIRED.
  2. MAXIMUM SLOPES IN THE ADA ACCESSIBLE PARKING STALLS SHALL BE 1.5%.




NO.	DATE	REVISIONS/ISSUANCES
1	XX/XX/20	SEAL XXXX

SITEWORKS (647) 921-2390  
 423 RAMBLEWOOD, STE. A (jst11@yahoo.com)  
 GLEN ELLYN, IL 60137

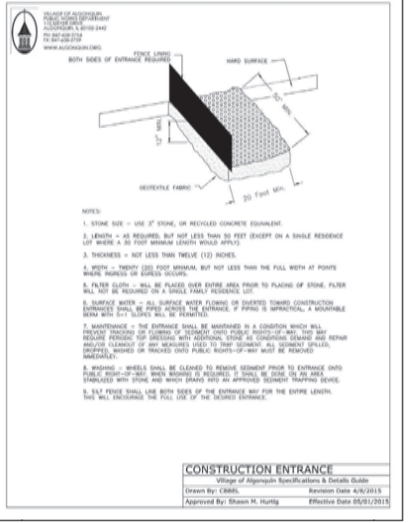
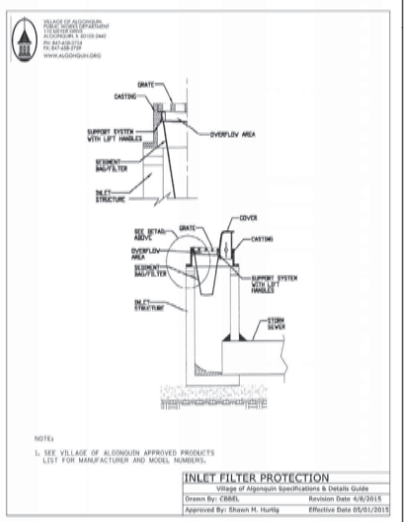
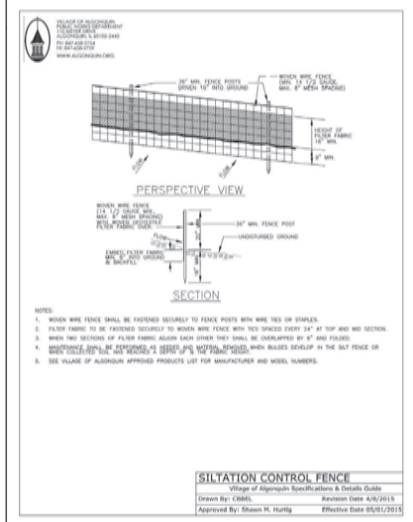
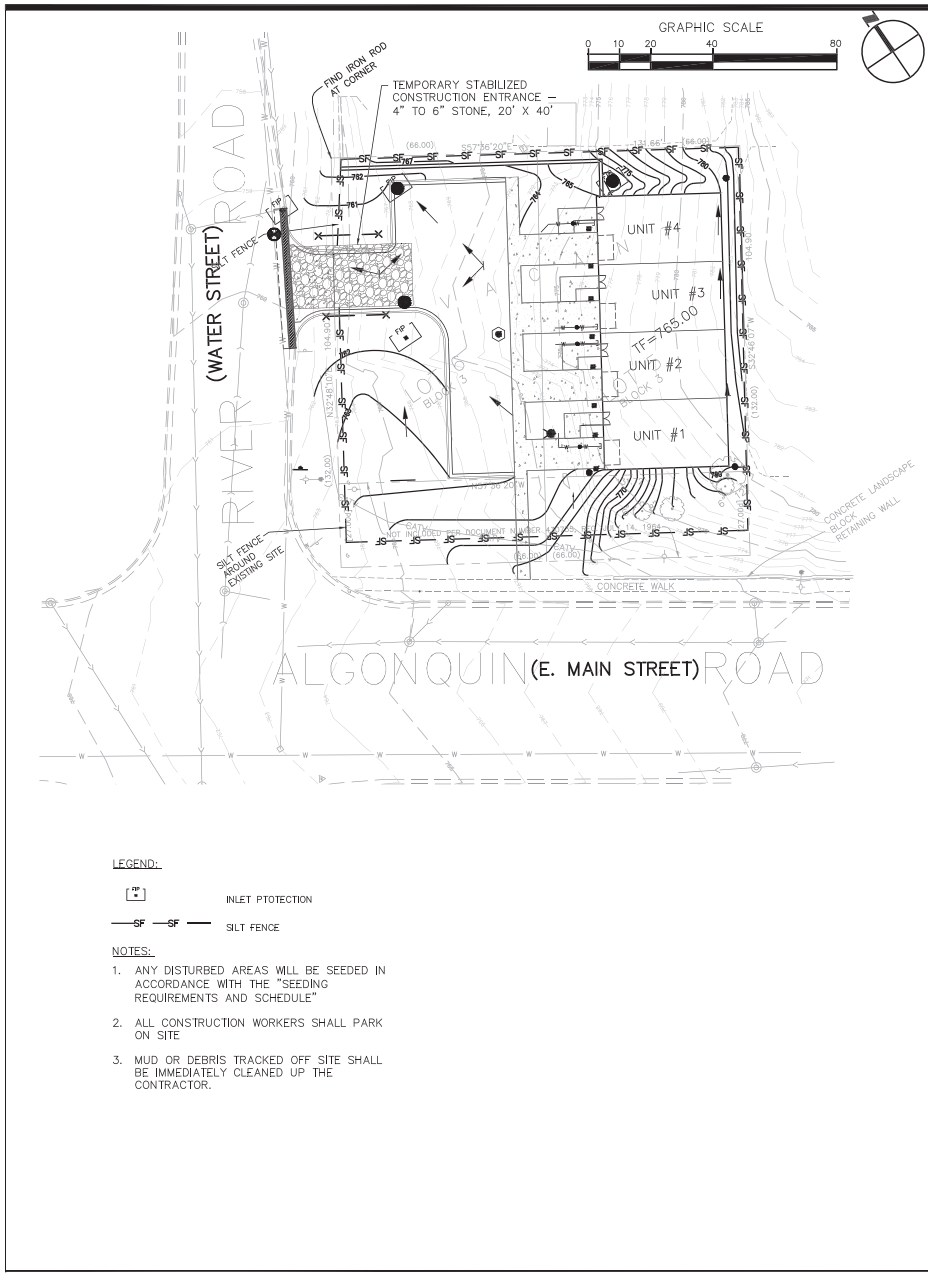


PROJECT NUMBER:	
PROJECT MANAGER:	JJP
ARCHITECT:	JJP
SCALE:	
DATE:	XX/XX/2020
CHECKED BY:	JJP

**GRADING PLAN**

C400





**NOTES:**

**SOIL EROSION AND SEDIMENT CONTROL**

1. REASONABLE CARE MUST BE TAKEN TO MINIMIZE SOIL EROSION. REFER TO THE "IL URBAN MANUAL" (IUM) AND IUM'S PERMIT IUM10. THE U.S. SOIL CONSERVATION SERVICE IS ALSO AVAILABLE TO PROVIDE GUIDANCE.
2. ANY DISTURBED AREAS SHALL BE KEPT TO A PRACTICAL MINIMUM AND SHALL BE MULCHED, SEEDED, SODDED, OR PAVED AS SOON AS POSSIBLE.
3. ALL INLETS, STRUCTURES, PIPES, SWALES, AND ROADS SHALL BE KEPT CLEAN AND FREE OF DIRT AND SILT. STOCKPILES SHALL HAVE A BERM OR TRENCH AROUND THE CIRCUMFERENCE TO CONTROL SILT IF NEEDED. IF THE STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS, IT MUST HAVE SUFFICIENT VEGETATION TO CONTROL BOTH WATER AND WIND EROSION AND MUST BE STABILIZED IMMEDIATELY.
4. STRAW BALES FIRMLY ANCHORED TO CONTROL SILT IF NEEDED. FOLLOWING PRELIMINARY EARTHWORK AND STORM SEWER CONSTRUCTION, SILT FENCE SHALL BE PLACED AROUND THE RETENTION POND AND HAY BALES SHALL BE STACKED AROUND INLET STRUCTURES.
5. PERENNIAL RYE GRASS SHALL BE SEEDED AND MAINTAINED IN AREAS WITH HIGH EROSION POTENTIAL.
6. MAINTAIN SOIL EROSION CONTROL DEVICES THROUGH THE DURATION OF THIS PROJECT.
7. REPLACE SOIL EROSION CONTROL DEVICES WITH TOPSOIL AND SOD AT THE COMPLETION OF THE PROJECT.
8. ALL ADJACENT ROADWAYS SHALL BE KEPT CLEAN AT ALL TIMES.
9. EROSION CONTROL MEASURES SHOWN ARE THE MINIMUM REQUIRED BY THE VILLAGE. ADDITIONAL SOIL EROSION CONTROL MEASURES MAY BE REQUIRED AT ANY TIME DURING THE COURSE OF CONSTRUCTION.

1. XXXX20 XXXX

NO. DATE REVISIONS/ISSUANCES

SITING WORKS (0471)921-2390  
 423 RAMBLEWOOD, STE. A jpl11@yahco.com  
 OLEN ELLYN, IL 60137

**JOHN J. PEEL**  
 062-034333  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF ILLINOIS

EXPRES 1-0-2021

PROJECT NUMBER:  
 PROJECT MANAGER: JJP  
 ARCHING: JJP  
 SCALE:  
 DATE: XX/XX/2020  
 CHECKED BY: JJP

**EROSION AND SEDIMENT CONTROL PLAN**  
**C600**



NOTES:

GENERAL NOTES AND CONDITIONS

1. ALL EARTHWORK, GRADING AND PAVING SHALL BE PERFORMED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION IN ILLINOIS, STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION (I.D.O.T.), ADOPTED APRIL 1, 2016, AND ALL REVISIONS AND SUPPLEMENTS THERETO, AND THE REQUIREMENTS AND SPECIFICATIONS OF THE VILLAGE OF ALGONQUIN.
2. ALL SANITARY SEWER, WATER MAIN, AND STORM SEWER SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS, SEVENTH EDITION DATED JULY 2014, AND ALL REVISIONS AND SUPPLEMENTS THERETO, AND THE PUBLISHED STANDARD SPECIFICATIONS AND REQUIREMENTS OF THE VILLAGE OF ALGONQUIN THE CONTRACTOR IS RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH THE VILLAGE OF ALGONQUIN REQUIREMENTS.
3. THE REQUIREMENTS AND SPECIFICATIONS OF THE VILLAGE OF ALGONQUIN SHALL GOVERN OVER ALL.
4. THE VILLAGE OF ALGONQUIN ENGINEERING DEPARTMENT, MUST BE NOTIFIED AT LEAST TWO (2) WORKING DAYS PRIOR TO THE COMMENCEMENT OR RESUMPTION OF ANY WORK.
5. THE CONTRACTOR SHALL KEEP CAREFUL MEASUREMENTS AND RECORDS OF ALL CONSTRUCTION AND SHALL FURNISH THE ENGINEER AND THE VILLAGE WITH RECORD DRAWINGS UPON COMPLETION OF HIS WORK. ONE SET OF MYLAR-REPRODUCIBLE RECORD DRAWINGS AND COPIES MUST BE FURNISHED TO THE VILLAGE BY THE DEVELOPER.
6. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION. THIS INCLUDES SANITARY SEWER, WATER MAIN, STORM SEWER, TELEPHONE, ELECTRIC GAS, CABLE, ETC. THE UTILITY PHONE NUMBER IS 1-800-892-0123.
7. ALL WORK PERFORMED BY THE CONTRACTOR SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF TWELVE (12) MONTHS FROM THE DATE OF FINAL ACCEPTANCE. THIS GUARANTEE SHALL INCLUDE ALL DEFECTS IN MATERIALS AND WORKMANSHIP.
8. ANY DIRT OR MATERIALS SHALL BE DISPOSED OF BY THE CONTRACTOR OFFSITE AT THE CONTRACTOR'S EXPENSE. THE DISPOSAL LOCATION MUST BE APPROVED BY THE VILLAGE IF IT IS WITHIN VILLAGE LIMITS.
9. ALL STRUCTURES, INLETS, PIPES, SWALES AND ROADS MUST BE KEPT CLEAN AND FREE OF DIRT AND DEBRIS AT ALL TIMES.
10. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ADEQUATE SIGNS, BARRICADES, FENCING, TRAFFIC CONTROL DEVICES AND MEASURES, AND ALL OTHER MEASURES THAT ARE NECESSARY TO PROTECT THE SAFETY OF THE SITE AT ALL TIMES.
11. THE CONTRACTOR, BY AGREEING TO PERFORM THE WORK, AGREES TO INDEMNIFY AND HOLD HARMLESS THE OWNER, THE ENGINEER, THE VILLAGE, AND ALL AGENTS AND ASSIGNS OF THOSE PARTIES, FROM ALL SUITS AND CLAIMS ARISING OUT OF THE PERFORMANCE OF SAID WORK, AND FURTHER AGREES TO DEFEND OR OTHERWISE PAY ALL LEGAL FEES ARISING OUT OF THE DEFENSE OF SAID PARTIES.
12. ALL ELEVATIONS ARE U.S.G.S. DATUM.

EARTHWORK, GRADING, AND PAVING

1. ALL PROPOSED PAVEMENT AREAS SHALL BE STRIPPED OF ALL TOPSOIL AND UNSUITABLE MATERIAL AND EXCAVATED OR FILLED TO WITHIN 0.10 FEET OF DESIGN SUBGRADE.
2. THE SUBGRADE SHALL BE FREE OF ALL UNSUITABLE MATERIAL AND SHALL BE COMPACTED TO A MINIMUM 95 PER CENT OF MODIFIED PROCTOR DENSITY. PROOF-ROLL SHALL BE PERFORMED BY A SOILS ENGINEER.
3. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY THE VILLAGE OF ALGONQUIN PRIOR TO PLACING THE BASE MATERIAL.
4. STOCKPILING OF SOIL SHALL BE AT LOCATIONS DESIGNATED BY OWNER.
5. THE EARTHWORK CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF SPOIL MATERIAL FROM THE UNDERGROUND CONTRACTORS, PREPARING THE ROADWAY SUBGRADE, PLACING TOPSOIL TO A MINIMUM DEPTH OF 6 INCHES TO FINISHED GRADE, GRADING OF DRAINAGE SWALES, AND ALL OTHER TASKS AS DIRECTED BY THE OWNER OR ENGINEER.
6. ANY QUANTITIES CONTAINED IN THESE DOCUMENTS ARE APPROXIMATE AND ESTIMATED, AND ARE PRESENTED AS A GUIDE TO THE CONTRACTOR IN DETERMINING ALL QUANTITIES AND TO BECOME FAMILIAR WITH THE SITE.
7. THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE AT THE CONCLUSION OF EACH WORKING DAY.
8. THE PAVING CONTRACTOR IS RESPONSIBLE FOR THE FINAL SUBGRADE PREPARATION, THE PAVEMENT BASE, BINDER, AND SURFACE, AND ALL FINAL CLEAN-UP AND RELATED WORK ASSOCIATED WITH THE PAVING OPERATION.
9. THE PROPOSED CURB AND GUTTER AND PAVEMENT SHALL BE OF THE TYPE AND THICKNESS AS SPECIFIED IN THE ENGINEERING DRAWINGS, AND CONSTRUCTED IN STRICT CONFORMANCE WITH THE PREVIOUS REFERENCED I.D.O.T. STANDARD SPECIFICATIONS... AND THE REQUIREMENTS OF THE VILLAGE OF ALGONQUIN.
10. CONCRETE SHALL BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE WITH 5-8% AIR ENTRAINMENT, 6-BAG MIX, WITH A MINIMUM COMPRESSIVE STRENGTH OF 3,500 P.S.I. AT 14 DAYS. ALL CONCRETE SHALL BE BROOM FINISHED.
11. CURING AND PROTECTION OF ALL CONCRETE SHALL BE IN STRICT CONFORMANCE WITH THE PROVISIONS OF SECTION 1020.13 OF THE I.D.O.T. STANDARD SPECIFICATIONS...
12. THE CURB AND GUTTER SHALL HAVE 3/4"-THICK PREMOULDED FIBER EXPANSION JOINTS WITH 3/4"-DIAMETER BY 18-INCH LONG PLAIN ROUND STEEL DOWEL BARS AT 50-FOOT INTERVALS, AT ALL PC'S AND PT'S, AND AT ALL CURB RETURNS. CONTRACTION JOINTS SHALL BE CONSTRUCTED AT 15-FOOT INTERVALS. THE COST OF THESE JOINTS SHALL BE INCIDENTAL TO THE CURB AND GUTTER.
13. DEPRESSED CURB SHALL BE PROVIDED FOR HANDICAPPED RAMPS AT ALL SIDEWALKS ABUTTING THE CURB AND GUTTER.

WATER MAIN

1. ALL WATER MAIN SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE CLASS 52 CONFORMING TO ANSI A-21.51 AND WITH JOINTS CONFORMING TO ANSI A-21.11. THE WATER MAIN SHALL BE CEMENT-LINED IN ACCORDANCE WITH ANSI A-21.4, BITUMINOUS COATED.
2. THE MINIMUM COVER FOR ALL WATER MAIN AND WATER SERVICE PIPE IS FIVE AND ONE-HALF FEET (5-1/2') FROM FINISHED GRADE TO TOP OF PIPE. ALL WATER MAINS UNDER AND WITHIN TWO FEET OF ANY EXISTING OR PROPOSED PAVEMENT OR SIDEWALK SHALL BE BACK FILLED WITH GRANULAR BACK FILL MATERIAL I.D.O.T. GRADATION CA-6 CRUSHED STONE OR APPROVED EQUAL.
3. ALL VALVES SHALL BE GATE VALVES AND BE FURNISHED MECHANICAL JOINTED, WITH CAST IRON BODY, BRONZE MOUNTED, BRONZE STEMMED, DOUBLE DISC PATTERN, WITH NON-RISING STEM AND BE DESIGNED FOR 300 POUNDS WORKING PRESSURE. ALL VALVES SHALL OPEN LEFT.
4. ALL WATER MAIN SHALL BE PRESSURE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AWWA, THE ILLINOIS EPA AND THE VILLAGE OF ALGONQUIN.
5. AFTER THE PRESSURE TEST HAS BEEN ACCEPTED, THE CONTRACTOR SHALL CHLORINATE THE WATER MAINS WITH GAS IN ACCORDANCE WITH THE REQUIREMENTS OF AWWA, THE ILLINOIS EPA, AND THE VILLAGE OF ALGONQUIN. CHLORINATION SHALL BE PERFORMED UNDER THE DIRECTION OF THE VILLAGE ENGINEERING DEPARTMENT AND/OR PUBLIC WORKS DEPARTMENT.
6. A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN THE WATER MAIN AND ANY SEWERS WHEN THEY ARE PARALLEL. WHENEVER A SEWER CROSSES A WATER MAIN, A MINIMUM VERTICAL DISTANCE OF 18 INCHES MUST BE MAINTAINED BETWEEN THE OUTSIDE OF THE PIPES, AND THE SEWER JOINTS ARRANGED SO THEY ARE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS. WHEN IT IS NECESSARY FOR A SEWER TO CROSS OVER THE TOP OF A WATER MAIN WITH A MINIMUM 18" SEPARATION, OR THE SEWER CROSSES UNDER THE WATERMAIN WITH LESS THAN 18" VERTICAL SEPARATION, OR 10' HORIZONTAL SEPARATION IS NOT MAINTAINED, THEN ONE OF THE FOLLOWING METHODS MUST ALSO BE CONSTRUCTED: A.) THE SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO THE WATER MAIN QUALITY PIPE (FOR A DISTANCE TEN (10) FEET EITHER SIDE OF A CROSSING) AND SHALL BE PRESSURE-TESTED TO INSURE WATER TIGHTNESS PRIOR TO BACK FILLING. OR B.) FOR CROSSINGS ONLY, THE RCP STORM SEWER SHALL BE CONSTRUCTED WITH O-RING GASKETED JOINTS (A.S.T.M. C-361) (FOR A DISTANCE OF TEN (10) FEET EITHER SIDE OF A CROSSING) OR C.) THE WATER MAIN SHALL BE ENCASED IN WATER MAIN QUALITY CASING PIPE (WATER TIGHT) AND SEALED AT BOTH ENDS (FOR A DISTANCE OF TEN (10) FEET EITHER SIDE OF A CROSSING).
7. THE WATER SERVICE PIPE SHALL BE 1 1/4" TYPE K COPPER. THE CORPORATION COCK SHALL BE MUELLER. THE CURB STOP SHALL BE MUELLER AND THE SERVICE BOX SHALL BE MUELLER #H10302. ALL ITEMS SHALL CONFORM TO THE VILLAGE OF ALGONQUIN.
8. EXISTING WELLS (IF ANY) TO BE CAPPED SHALL BE CAPPED BY A PROPERLY LICENSED CONTRACTOR. THE CONTRACTOR SHALL NOTIFY THE PROPER GOVERNING AUTHORITIES AND OBTAIN THE REQUIRED PERMITS FROM THEM.

STORM SEWER

1. ALL STORM SEWER SHALL BE CONSTRUCTED OF REINFORCED CONCRETE PIPE CLASS III OR THICKER CONFORMING TO A.S.T.M. C-76, WITH EITHER MASTIC OR PERFORMED JOINTS (A.S.T.M. C-433).
2. ALL INLETS, CATCH BASINS, AND MANHOLES SHALL BE PRECAST CONCRETE.
3. ALL STORM SEWERS UNDER AND WITHIN TWO FEET OF ANY EXISTING OR PROPOSED PAVEMENT OR SIDEWALK SHALL BE BACK FILLED WITH GRANULAR BACK FILL MATERIAL I.D.O.T. GRADATION CA-6 CRUSHED STONE OR APPROVED EQUAL.
4. ANY FIELD TILES ENCOUNTERED SHALL BE RECONNECTED OR CONNECTED TO THE STORM SEWER SYSTEM. THE SIZE, LOCATION, AND DEPTH OF THE TILES SHALL BE RECORDED BY THE CONTRACTOR AND IMMEDIATELY REPORTED TO THE VILLAGE OF ALGONQUIN AND THE ENGINEER.
5. ALL DOWNSPOUTS SHALL CONNECT DIRECTLY TO THE STORM WATER SYSTEM.

SANITARY SEWER

1. THE VILLAGE OF ALGONQUIN PUBLIC WORKS DEPARTMENT MUST BE NOTIFIED AT LEAST TWO (2) WORKING DAYS PRIOR TO THE COMMENCEMENT OF WORK.
2. ALL ELEVATIONS ARE U.S.G.S. DATUM.
3. ALL FLOOR DRAINS SHALL DISCHARGE TO THE SANITARY SEWER.
4. ALL DOWN SPOUTS, FOOTING DRAINS, AND OUTSIDE DRAINS SHALL DISCHARGE TO THE STORM SEWER SYSTEM OR TO GRADE.
5. ALL SANITARY SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC) SDR 26, IN ACCORDANCE WITH A.S.T.M. D-2241 AND JOINTS IN ACCORDANCE WITH A.S.T.M. D3139 OR APPROVED EQUAL.
6. VILLAGE APPROVED BEDDING MATERIAL FOR PLASTIC PIPE SHALL CONFORM A.S.T.M. D2321, CLASS II NON-ANGULAR AGGREGATE EXCEPT THE MAXIMUM SIZE SHALL BE 1/2 INCH, CA-6 WASHED STONE (NO LIMESTONE), BEDDING SHALL EXTEND 12" OVER TOP OF PIPE. (SEE DETAIL.)
7. "BAND-SEAL" OR SIMILAR FLEXIBLE-TYPE COUPLINGS SHALL BE USED IN THE CONNECTION OF SEWER PIPE OF DISSIMILAR MATERIALS.
8. WHEN CONNECTING TO AN EXISTING SEWER MAIN BY MEANS OTHER THAN AN EXISTING WYE, TEE, OR AN EXISTING MANHOLE, ONE OF THE FOLLOWING METHODS SHALL BE USED:
  - 8.1. CIRCULAR SAW-CUT OF THE SEWER MAIN BY PROPER TOOLS ("SE" MACHINE OR SIMILAR) AND PROPER INSTALLATION OF HUB-WYE SADDLE OR HUB-TEE SADDLE.
  - 8.2. REMOVE AN ENTIRE SECTION OF PIPE (BREAKING ONLY THE TOP OF ONE BELL) AND REPLACE WITH A WYE OR TEE BRANCH SECTION.
  - 8.3. WITH PIPE CUTTER, NEATLY AND ACCURATELY CUT OUT DESIRED LENGTH OF PIPE FOR INSERTION OF PROPER FITTING, USING "BAND-SEAL" OR SIMILAR COUPLINGS TO HOLD IT FIRMLY IN PLACE.
  - 8.4. INSTALL A NEW MANHOLE.
9. ALL SEPTIC TANKS (IF ANY) BEING ABANDONED SHALL BE FILLED OR REMOVED. APPROVAL MUST BE OBTAINED FROM THE VILLAGE OF ALGONQUIN CONTRACTORS SHALL OBTAIN ANY NECESSARY PERMITS FOR REMOVAL.
10. WATERMAIN & SANITARY SEWER SEPARATION SHALL BE PER SECTION 41-2.01 OF THE STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS, SEVENTH EDITION DATED JULY 2014, AND ALL REVISIONS AND SUPPLEMENTS THERETO OR SECTION 370.350 OF THE ILLINOIS RECOMMENDED STANDARDS FOR SEWAGE WORKS.
11. SANITARY SEWER TESTING SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS. SANITARY SEWERS SHALL BE AIR TESTED AND DEFLECTION TESTED.
12. AFTER FINAL APPROVAL PROVIDE A REPRODUCIBLE RECORD DRAWING WHICH HAS BEEN FIELD-CHECKED FOR ACCURACY AND ALL NECESSARY TIES AND LOCATIONS.
13. A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN THE WATER MAIN AND ANY SEWERS WHEN THEY ARE PARALLEL. WHENEVER A SEWER CROSSES A WATER MAIN, A MINIMUM VERTICAL DISTANCE OF 18 INCHES MUST BE MAINTAINED BETWEEN THE OUTSIDE OF THE PIPES, AND THE SEWER JOINTS ARRANGED SO THEY ARE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS. WHEN IT IS NECESSARY FOR A SEWER TO CROSS OVER THE TOP OF A WATER MAIN WITH A MINIMUM 18" SEPARATION, OR THE SEWER CROSSES UNDER THE WATERMAIN WITH LESS THAN 18" VERTICAL SEPARATION, OR 10' HORIZONTAL SEPARATION IS NOT MAINTAINED, THEN ONE OF THE FOLLOWING METHODS MUST ALSO BE CONSTRUCTED:
  - A.) THE SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO THE WATER MAIN QUALITY PIPE (FOR A DISTANCE TEN (10) FEET EITHER SIDE OF A CROSSING) AND SHALL BE PRESSURE-TESTED TO INSURE WATER TIGHTNESS PRIOR TO BACK FILLING.
  - B.) FOR CROSSINGS ONLY, THE RCP STORM SEWER SHALL BE CONSTRUCTED WITH O-RING GASKETED JOINTS (A.S.T.M. C-361) (FOR A DISTANCE OF TEN (10) FEET EITHER SIDE OF A CROSSING).
  - C.) THE WATER MAIN SHALL BE ENCASED IN WATER MAIN QUALITY CASING PIPE (WATER TIGHT) AND SEALED AT BOTH ENDS (FOR A DISTANCE OF TEN (10) FEET EITHER SIDE OF A CROSSING).

SEAL	---
---	---
---	---
---	---
---	---
---	---

1	XXXX	XXXX
NO.	DATE	REVISIONS/ISSUANCES

SITEWORKS (847) 921-2360  
 423 RAMBLEWOOD, STE. A jpl11@yahoo.com  
 GLEN ELLYN, IL 60137

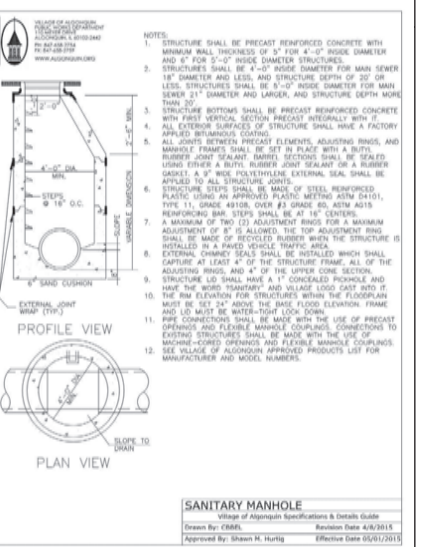
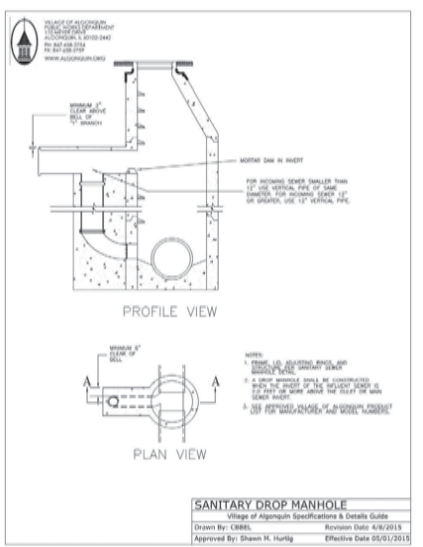
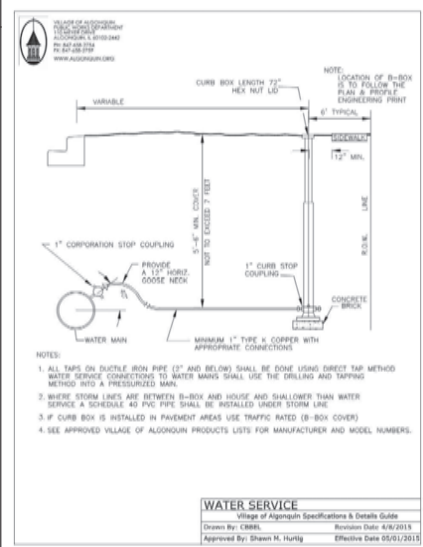
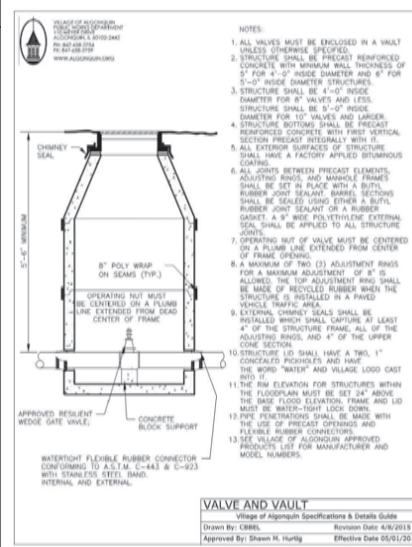
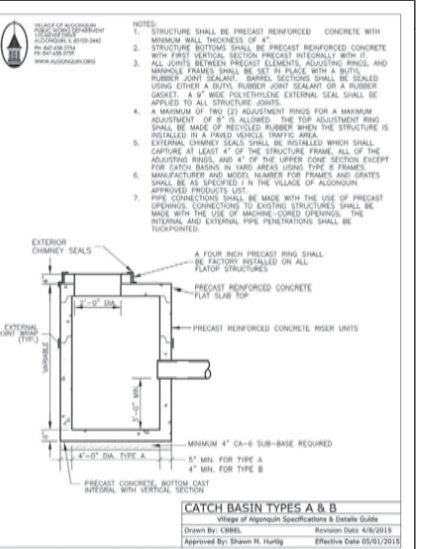
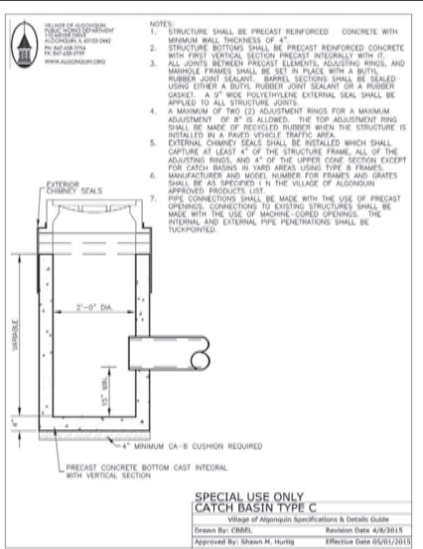
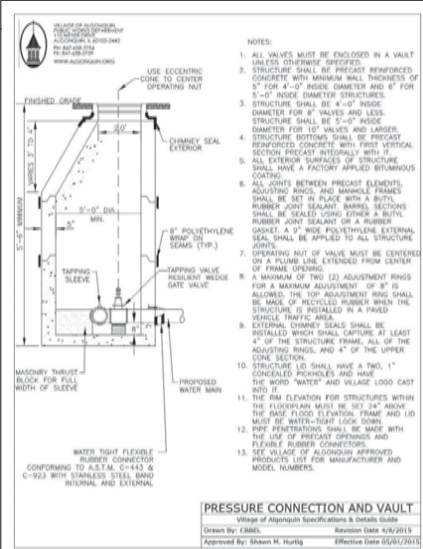
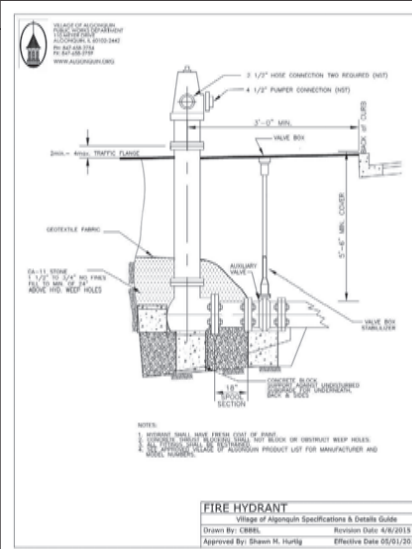


PROJECT NUMBER:	
PROJECT MANAGER:	JJP
ARCHITECT:	JJP
SCALE:	
DATE:	XX/XX/2020
CHECKED BY:	JJP

SPECIFICATIONS  
 C700







NO. DATE REVISIONS/ISSUANCES  
 1. XXXX XXXX  
 SITEWORKS (847) 921-2390  
 423 RAMBLEWOOD, STE. A jsh11@yahoo.com  
 OLEN ELLYN, IL 60137

EXPRESS 1-31-2021  
 PROJECT NUMBER:  
 PROJECT MANAGER: JUP  
 ARCHING: JUP  
 SCALE:  
 DATE: XX/XX/2020  
 CHECKED BY: JUP

JOHN J. PEEL  
 062.034333  
 LICENSED  
 PROFESSIONAL  
 ENGINEER  
 STATE OF ILLINOIS



**VILLAGE OF ALGONQUIN**  
*PUBLIC WORKS DEPARTMENT*

**– M E M O R A N D U M –**

DATE: October 5, 2020

TO: Russ Farnum, Community Development Director

CC: Robert Mitchard, Public Works Director

FROM: Victor C Ramirez, P.E. Project Engineer (CBBEL)

SUBJECT: **Case No. 2020-05. PW Staff Review #1**  
*Riverview Townhomes*

---

The Public Works Staff review team has reviewed the “xx” dated engineering plans by John Pezl for the proposed Riverview Townhomes Project.

Our review comments are as follows:

This review requires all comments in the CBBEL review of this submittal be addressed.

1.) Site Plan:

- The plans are titled “Final Engineering” and these are not final engineering plans.
- The site is very tight and not conducive easy traffic maneuvering. This site may be better suited for 2 or 3 units instead. Unit #1 driveway has no backing space.
- The “guest” parking stalls on the north side of the lot face an existing single family home. Headlights from cars using these spaces will be an issue.
- The proposed project consists of four-3 bedroom units with 1 car garage parking and 4 “guest” stalls. There is no place for on-street parking. This site cannot feasibly accommodate the potential number of vehicles.

2.) Elevation contours, drainage and grading:

- Show grades for the sidewalk that extends to the Rt. 62 sidewalk.

3.) Utilities:

A.) Water:

- Move the fire hydrant to the ROW on River Road and connect to the watermain there.

- Re-evaluate the system layout for domestic and fire protection use.
- Supply calculations to ensure the proposed 6" watermain service is adequate.

B.) Sanitary Sewer:

- The proposed layout with 4 service laterals entering one manhole is unacceptable. Alternative layouts need to insure each unit has its own line and responsibility for maintenance to a connection on the public sewer and/or manhole(s) located in the public ROW. Manhole 100 will require a new bench and flow channel reconstruction.

4.) Landscaping:

- A tree inventory including size, species, and condition needs to be submitted.
- There was no landscape plan submitted. A landscape plan is required.

5.) Plat of survey:

- There was no plat of survey included and one is required.



**CHRISTOPHER B. BURKE ENGINEERING, LTD.**

9575 West Higgins Road Suite 600 Rosemont, Illinois 60018 TEL (847) 823-0500 FAX (847) 823-0520

October 9, 2020

Village of Algonquin  
2200 Harnish Drive  
Algonquin, IL 60102

Attention: Russ Farnum, Director of Community Development

Subject: Riverview Townhomes – FIRST REVIEW  
Algonquin Case No2020-05  
(CBBEL Project No. 07-0272.00127)

Dear Russ:

We have reviewed the following documents related to the aforementioned project:

- Final Engineering Plans prepared by Siteworks. bearing no revision date

The following deficiencies need to be addressed before Christopher B. Burke Engineering, Ltd. can recommend approval of final engineering to the Village:

**FINAL ENGINEERING PLANS**

Sheet C100

1. The revision date for the plan submittal shall be added to the title block.

Sheet C200

2. The engineer should be provided with utility information from the Village's GIS system as we note the following discrepancies in the existing utility information on the plan sheet:
  - Flow direction arrows shall be added to the storm and sanitary sewers.
  - There appears to be at least one missing storm structure at the intersection of North River Road and Algonquin Road as the storm sewers north and south of the intersection flow to each other given the noted inverts.
  - In conjunction with above, the east-west 30-inch storm sewer has not outlet west of the noted structure on Algonquin Road.

3. The engineer shall verify the diameter and material type of the sanitary sewer on North River Road as the information at the upstream and downstream manholes is inconsistent.

#### Sheet C300

4. The engineer shall provide a turning exhibit for ingress and egress to the garage for Unit 1. It appears that the car will have to back out entirely to the common entryway to make the turn to exit the site. The same condition exists for Units 2 and 3, but to lesser degrees.

#### Sheet C400

5. We are aware that Public Works has expressed a concern about headlights from vehicles in the guest stalls negatively impacting the adjacent residence, but we note that the stalls are much lower in elevation than the residence and the stalls will be fronted with a 4' high retaining wall.
6. The proposed top of foundation for the proposed structure is 765.00 but the adjacent proposed contour along the east side of the structure is for elevation 780.0. All steps in the proposed foundation shall be added to the plan sheet.
7. The rim elevations for all of the structures located within the parking area shall be added to the plan sheet.
8. Additional spot elevations are needed for the sidewalk in front of the homes.
9. Additional spot elevations are needed for the sidewalk leading to the sidewalk on Route 62/Main Street.
10. It is not clear if there is to be barrier curb, alone or curb & gutter along the west side of the sidewalk in front of the homes. If the sidewalk and curb are to be poured monolithically, then a detail for that shall be added to the plan set.
11. Spot grades are needed at the building corners and around the perimeter to verify positive flow away from the structures.
12. The overland flow arrows along the east side of the building are drawn inside the footprint of the structure. If flow is to be along the outside face of the structure, then additional spot grading is needed to verify that the flow will travel northward.

#### Sheet C500

13. The total length of 6" PVC should be increased to 179 LF from 126 LF.
14. The total length of the 6" watermain should be increased to 170 LF.
15. The utility crossing information for all of the crossings of the watermain and water services are missing from the plan sheet.

16. The utility crossing information for all of the crossings of the downspout line on the west side of the building is missing from the plan sheet.
17. The proposed fire hydrant will be located on private property. It is Village policy to maintain all fire hydrants so an alternate location will need to be found on public property or where an easement can be granted.

#### Sheet C600

18. The symbol for the inlet filter will be moved so that it covers structure 14.
19. The boundary of the proposed silt fence along Route 62/Main Street shall be relocated to the parkway to encompass all of the proposed area of disturbance.
20. SOIL EROSION AND SEDIMENTATION CONTROL NOTE 4 shall be revised to note the use of a silt fence around any stockpiles versus trench or berm.
21. SOIL EROSION SEDIMENTATION CONTROL NOTE 5 shall be revised to eliminate the use of hay bales.
22. SOIL EROSION AND SEDIMENTATION CONTROL NOTE 6 shall be deleted or revised to make it project specific.
23. Sheet Note 2 appears to be impossible to accommodate as there is little room on the site to provide construction parking.

#### Sheet C801

24. The detail for the VALVE AND VAULT can be deleted from the plan sheet as the PRESSURE CONNECTION AND VAULT will be applicable for this project.

### **STORMWATER MANAGEMENT**

25. The site is 13,184 SF in area and most of it will be disturbed during the development process. 8,355 SF of new impervious surface is being proposed. The site is not required to provide detention storage but must apply for Stormwater Certification and provide a Stormwater Mitigation BMP per Section 9-107 of the Kane County Stormwater Ordinance. The volume required is 696 CF (8355/12).

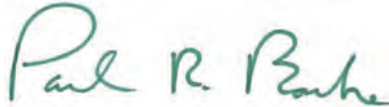
### **OUTSIDE PERMITTING AGENCIES**

26. A permit from IDOT is required for all work performed within the Route 62/Main Street right-of- way.

## GENERAL COMMENTS

27. The proposed retaining wall will need to be designed by a structural engineer or architect licensed in Illinois.
28. The proposed development will bridge over the lot lines of the two currently platted lots. We recommend that the parcels be consolidated and that a plat of consolidation be submitted by the applicant for review with the next submittal.

Sincerely,



Paul R. Bourke, PE CFM  
Assistant Head, Municipal Department



Michael E. Kerr, PE  
President

PRB/prb

N:\ALGONQUIN\070272\070272.00127\Admin\L1.010920.docx



**VILLAGE OF ALGONQUIN**  
*PUBLIC WORKS DEPARTMENT*

**- M E M O R A N D U M -**

DATE: September 21, 2020  
TO: Bob Mitchard, Public Works Director  
FROM: Steve Ludwig, General Services Supt.  
SUBJECT: Holiday Lighting Recommendation

---

I have solicited proposals for this year's holiday decorations provision and installation project. The costs reflect the same work we did last year, and adding the section of Main St. north of the bridge (which was not yet complete last year). We received three proposals (attached). One of the proposers is the team that did the work last year, Artistic Holiday Designs. I do not have experience with the other contractors, although B&B does have some decent references and McFarlane-Douglass is a fairly well known company.

The figures proposed are as follows:

Artistic Holiday Designs	\$30,441.45
B&B Holiday Decorating:	\$29,907.00
McFarlane-Douglass Co.:	\$37,375.00

The budgeted amount was \$27,000.

These costs include provision, installation, maintenance, and take down of all lights and decorations. The only item provide by the Village will be the holiday tree in the plaza next to the Historic Village Hall. In addition, it is likely that we could realize some cost savings if we negotiate a 3-5 year contract. Please let me know if we wish to pursue this once we approve the proposal.

I recommend B&B Holiday Decorating of Des Plaines, Illinois be awarded the work for the amount of \$29,907.



Artistic Holiday Design - Algonquin, IL. Holiday Decorations Pricing			
Location	Item	Quantity	1 Year Lease Price
Historic Village Hall	C9	275	\$1,100.00
Festival Plaza	Supplied 20ft tree		
	Mini lights	35	\$506.45
	Silver/Red ornaments decor package	1	\$450.00
	Install customers additional tree decor with ornaments	1	\$250.00
	Illuminated Wreath - 5ft	2	\$600.00
	36 inch Grapevine Spheres - Illuminated	8	\$2,360.00
	24 inch Grapevine Spheres - Illuminated	4	\$740.00
	Downtown Arch Spritzers	12	\$1,020.00
	Estate Garland: Red/silver	6	\$690.00
	Downtown Poles	Estate Garland: red/silver	10
Illuminated Wreath - 5ft		11	\$3,300.00
Downtown Trees	Mini lights, color TBD	500	\$7,235.00
Downtown Beds	36 inch Grapevine Spheres, color TBD	26	\$7,670.00
	24 inch Grapevine Spheres, color TBD	12	\$2,220.00
Historic Village Hall Lot	Estate Garland: red/silver	10	\$1,150.00
<b>Total</b>			<b>\$30,441.45</b>
Includes logistics, installation, Response time - within 24 hours, take down, and storage.			

B&B Holiday Decorations - Algonquin, IL. Holiday Decorations Pricing			
Location	Item	Quantity	1 Year Lease Price
Historic Village Hall	C9	275	\$962.00
Festival Plaza	Supplied 20ft tree		
	Mini lights	35	\$490.00
	Silver/Red ornaments decor package	1	\$540.00
	Install customers additional tree decor with ornaments	1	Included
	Illuminated Wreath - 5ft	2	\$530.00
	36 inch Grapevine Spheres - Illuminated	8	\$2,520.00
	24 inch Grapevine Spheres - Illuminated	4	\$700.00
	Downtown Arch Spritzers	12	\$920.00
	Estate Garland: Red/silver	6	\$660.00
	Downtown Poles	Estate Garland: red/silver	10
Illuminated Wreath - 5ft		11	\$2,915.00
Downtown Trees	Mini lights, color TBD	500	\$7,000.00
Downtown Beds	36 inch Grapevine Spheres, color TBD	26	\$8,190.00
	24 inch Grapevine Spheres, color TBD	12	\$1,980.00
Historic Village Hall Lot	Estate Garland: red/silver	10	\$1,400.00
<b>Total</b>			<b>\$29,907.00</b>
Includes logistics, installation, Response time - within 24 hours, take down, and storage.			

McFarlane Douglass Holiday Pricing with <b>LED Lights</b>			
Algonquin, IL. Holiday Decorations Pricing			
<b>Location</b>	<b>Item</b>	<b>Quantity</b>	<b>1 Year Lease Price</b>
Historic Village Hall	C9	275	\$1,600.00
Festival Plaza	Supplied 20ft tree		
	Mini lights	35	\$875.00
	Silver/Red ornaments decor package	1	\$300.00
	Install customers additional tree decor with ornaments	1	\$200.00
	Illuminated Wreath - 5ft	2	\$600.00
	36 inch Grapevine Spheres - Illuminated	8	\$2,400.00
	24 inch Grapevine Spheres - Illuminated	4	\$800.00
	Downtown Arch Spritzers	12	\$900.00
	Estate Garland: Red/silver	6	\$600.00
Downtown Poles	Estate Garland: red/silver	10	\$1,000.00
	Illuminated Wreath - 5ft	11	\$4,400.00
Downtown Trees	Mini lights, color TBD	500	\$12,500.00
Downtown Beds	36 inch Grapevine Spheres, color TBD	26	\$7,800.00
	24 inch Grapevine Spheres, color TBD	12	\$2,400.00
Historic Village Hall Lot	Estate Garland: red/silver	10	\$1,000.00
<b>Total</b>			<b>\$37,375.00</b>
Includes logistics, installation, Response time - within 24 hours, take down, and storage.			

	Village of Glen Ellyn/Dave Buckley
Were the holiday decorations installed on time?	Yes they were
Did they use quality products & install them properly?	Yes they did. There were issues with the downtown street lights on one circuit, but that was more of a weather related issue and they will be updating their 1980 circuit breaker
Was their customer service responsive when issues occurred? (how soon were problems resolved)	They were pretty good about it. They had the trees draped like a canopy not wrapped. So it was new to them. They were very responsive. However, some things they did themselves if it was simple or would be ruined by waiting. They never had issues with wondering where they were after responding. They usually came that day.
Would you hire them again?	Yes, they were a good value and responsive. They are going out to bid soon and if B&B Holiday Decorating are the low bidder, he will be happy with that.

Village of Winnetka/Brenden Mendoza	Village of Tinley Park/Kelly Mulqueeny
Yes, everything was good. They did cut it close to the end with finishing touches, but did finish on time	Yes
Yes	Village of Tinley Park owns the product
Yes, they did a good job responding to issues or missing lights. They got to them in a reasonable amount of time. They fixed them when someone was in the area.	Yes
Yes, they have been good to work with and will be doing their lights this year.	Yes



**VILLAGE OF ALGONQUIN**  
*PUBLIC WORKS DEPARTMENT*

**– M E M O R A N D U M –**

DATE: *October 14, 2020*

TO: *Bob Mitchard, Public Works Director*

FROM: *Jason Schutz, Utilities Superintendent*

SUBJECT: *Risk and Resilience Study*

---

As you know, The American Water Infrastructure Act of 2018 requires all public water systems to produce a Risk and Resilience Assessment (RRA). The Act gives utilities flexibility in choosing the specific approach and level-of-detail used to meet the requirements. AWWA recommends using the ANSI/AWWA J100 Standard Risk Analysis and Management for Critical Asset Protection (RAMCAP). The money provided here will allow the Village's Water Division to team with EEI as a consultant to utilize the RAMCAP standard to perform the RRA for our utility and facilities. The act also requires the Village to update our Emergency Response Plans based on the results of the RRA. The Act requires all systems to certify completion of the Emergency Response Plan within 6 months of certifying the RRA.

Currently, in the Capital Improvement Budgets within the Water and Sewer Improvement Fund, we have \$50,000.00 budgeted in Engineering Services for this study. We recommend that the necessary actions be taken to contract EEI in the amount of \$49,054.00 for our Risk and Resilience Assessment.

**AGREEMENT FOR CONSULTING ENGINEERING SERVICES FOR  
Risk and Resilience Assessment and Emergency Response Planning – Water Utility**

This Agreement, made this \_\_\_\_\_ day of \_\_\_\_\_, 2020 by and between the Village of Algonquin, Illinois, a municipal corporation of the State of Illinois (hereinafter referred to as the "VILLAGE") and Engineering Enterprises, Inc. of 52 Wheeler Road, Sugar Grove, Illinois, 60554 (hereinafter referred to as the "ENGINEER").

In consideration of the mutual covenants and agreements contained in this Agreement, the VILLAGE and the ENGINEER agree, covenant and bind themselves as follows:

1. Services: ENGINEER agrees to perform for the VILLAGE the Services defined within Attachment A.
2. Direction: The Utilities Superintendent, or his written designee, shall act as the VILLAGE'S representative with respect to the Services to be provided by the ENGINEER under this Agreement and shall transmit instructions and receive information with respect to the Consulting Engineering Services.
3. Compensation: The work items, estimated staff time, and projected fees for each work item are summarized within Attachment B. Based on this computation, the VILLAGE agrees to pay the ENGINEER for providing the Services set forth herein a fixed fee amount of \$49,000.
4. Term: The term of this Agreement shall be active through December 31, 2021 unless otherwise extended through written confirmation by both parties. The ENGINEER shall schedule the project initiation meeting/site visit to commence within two (2) weeks following receipt of a fully executed agreement. A general project schedule for the Project is included as Attachment C.
5. Payment: Engineer shall invoice the VILLAGE on a monthly basis for Services performed and any costs and expenses incurred during the previous thirty (30) day period. The VILLAGE shall pay the ENGINEER within thirty (30) days of receipt of said invoice.
6. Termination: This Agreement may be terminated upon fourteen (14) days written notice of either party. In the event of termination, the ENGINEER shall prepare a final invoice and be due compensation calculated as described in paragraph 3 for all costs incurred through the date of termination.
7. Documents: All related writings, notes, documents, information, files, etc., created, compiled, prepared and/or obtained by the ENGINEER on behalf of the VILLAGE for the Services provided herein shall be used solely for the intended project.
8. Notices: All notices given pursuant to this Agreement shall be sent Certified Mail, postage prepaid, to the parties at the following addresses:

The VILLAGE:

Public Works Director  
VILLAGE of Algonquin  
110 Meyer Drive  
Algonquin, IL 60102

The ENGINEER:

Engineering Enterprises, Inc.  
52 Wheeler Road  
Sugar Grove, IL 60554

9. Waiver: The failure of either party hereto, at any time, to insist upon performance or observation of any term, covenant, agreement or condition contained herein shall not in any manner be constructed as a waiver of any right to enforce any term, covenant, agreement or condition hereto contained.
10. Amendment: No purported oral amendment, change or alteration hereto shall be allowed. Any amendment hereto shall be in writing by the governing body of the VILLAGE and signed by the ENGINEER.
11. Succession: This Agreement shall ensure to the benefit of the parties hereto, their heirs, successors and assigns.


IN WITNESS WHEREOF, we have hereunto signed our names the day and year first above written.

VILLAGE OF ALGONQUIN

ENGINEERING ENTERPRISES, INC.:

---

Robert Mitchard  
Director of Public Works



---


Julie Morrison, P.E.  
Senior Project Manager/Principal

ATTEST:

ATTEST:

---

Jerry Kautz  
Village Clerk



---

Tim Holdeman  
Senior Project Manager

**ATTACHMENT A**  
**SCOPE OF SERVICES**  
**RISK AND RESILIENCE ASSESSMENT AND EMERGENCY RESPONSE PLANNING –**  
**WATER UTILITY**  
Village of Algonquin, IL

**BACKGROUND**

The American Water Infrastructure Act (Public Law Number 115-270, passed 10/23/2018) requires all Community Water Supplies serving populations greater than 3,300 to conduct an assessment of the risks to, and resilience of, its water system. The Risk and Resilience Assessment (RRA) must include an assessment of:

- the risk to the system from malevolent acts and natural hazards;
- the resilience of the pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, electronic, computer, or other automated systems (including the security of such systems) which are utilized by the system;
- the monitoring practices of the system;
- the financial infrastructure of the system;
- the use, storage, or handling of various chemicals by the system; and
- the operation and maintenance of the system.

Based on the population served of approximately 31,000, the Village of Algonquin (Village) must submit to the US EPA Administrator a certification that the system has conducted a compliant RRA prior to June 30, 2021.

In addition, the Village must prepare an Emergency Response Plan (ERP) that incorporates the findings of the RRA and certify to the US EPA Administrator, not later than six (6) months after completion of the RRA, that the system has completed such a plan. The ERP must include:

- strategies and resources to improve resilience, including physical security and cybersecurity,
- plans and procedures for responding to a natural hazard or malevolent act that threatens safe drinking water,
- actions and equipment to lessen the impact of a malevolent act or natural hazard, including alternative water sources, relocating intakes and flood protection barriers; and
- strategies to detect malevolent acts or natural hazards that threaten the system.

Engineering Enterprises Inc. (EEI) will assist the Village in meeting the regulatory requirements of the American Water Infrastructure Act of 2018 for its Community Water System by conducting the following Scope of Services.

Note: The Scope of Service assumes the Village will utilize its Information Technology Department or other resources (e.g. SCADA design consultant) to perform all necessary tasks associated with the assessment of resilience of relevant computer systems, including the water SCADA system.



## **TASK A: PROJECT ADMINISTRATION AND FACILITATION**

### **Task A-1: Project Administration**

This task includes a Project Kick-off meeting and site visit, overall project planning, coordination with the Village, and project management.

### **Task A-2: Stakeholder Assistance and Workshops**

Stakeholder Involvement is important to the development of the RRA and ERP. It is also required to fulfill the regulatory requirements of the American Water Infrastructure Act.

EEl will assist the Village in designating internal and external stakeholders that will participate in the development of the RRA and ERP. We anticipate the following stakeholder groupings:

- Program Champion – Engineering and Public Works staff member, responsible for overall project coordination.
- Steering Committee – Program Champion and other staff who will participate in key decisions regarding the Village's priorities and preferences throughout the project.
- Stakeholder Group – Representatives from organizations inside (e.g. Public Works Administration, Information Technology, Finance, Police, and Fire) and outside the Village (e.g. County Local Emergency Planning Committee) who will participate in Workshops and provide input based on the perspective of the organization they represent.

EEl will lead up to two (2) Stakeholder Group Workshops during the development of the RRA and ERP. It is anticipated that one (1) workshop will be conducted for the RRA and one (1) for the ERP.

### **Task A-3: Steering Committee Assistance and Progress Meetings**

EEl will lead up to five (5) Steering Committee meetings during the development of the RRA and ERP. It is anticipated that three (3) meetings will be conducted for the RRA and two (2) for the ERP.

## **TASK B – RISK AND RESILIENCE PLAN**

### **Task B-1: Asset Characterization**

An Asset Characterization will be completed in accordance with the AWWA/ANSI J-100 Risk Analysis and Management for Critical Asset Protection (RAMCAP) Standard for Risk and Resilience Management of Water and Wastewater Systems. The purpose of Asset Characterization is to determine the water assets that, if compromised, could impair the Village's ability to complete its mission.

For Task B-1, EEl will review relevant information from the Village and other sources, facilitate discussions, provide engineering support, and document decisions by the Steering Committee as necessary to complete the following tasks:

- a) Identify critical functions of the Village water and systems and associated assets to determine which assets are critical to their mission.
- b) Develop a list of potentially critical assets.
- c) Identify the critical internal and external infrastructures that support the potentially critical assets.
- d) Prioritize the potentially critical assets using the estimated consequences.
- e) Identify critical assets by screening the prioritized list using criteria relevant to the decisions to be made.

**Task B-2: Threat Characterization**

A Threat Characterization will be completed in accordance with the AWWA/ANSI J-100 Risk Analysis and Management for Critical Asset Protection (RAMCAP) Standard for Risk and Resilience Management of Water and Wastewater Systems. The threats to be considered will include man-made hazards or accidents, natural hazards, and dependency hazards (interruptions of supply chains or proximity to dangerous sites). The specific threats in each category will include the Reference Threats defined by the RAMCAP methodology and modified by USEPA in Baseline Information on Malevolent Acts for Community Water Systems (see table). Other threats may be added at the utility’s discretion.

Malevolent Threats by Threat Category								
Aircraft	Assault Team	Maritime	Vehicle Borne Bomb	Contamination of Product	Directed / Sabotage	Theft or Diversion	Cyber Insider	Cyber Outsider
A1 - Helicopter	AT1 - 1 Assailant	M1 - Small Boat	V1 - Car	C(B) - Biotoxin	S(P) – Physical Insider	T(P) – Physical Insider	C11 - Insider	CO1 - Cyber Outsider Attackers
A2 - Small Plane	AT2 - 2-4 Assailants	M2 - Fast Boat	V2 - Van	C(C) - Chemical	S(P) – Physical Outsider	T(P) – Physical Outsider	C12 - Trusted Insider / Accidental	CO2 - Criminal Group
A3 - Regional Jet	AT3 - 5-8 Assailants	M3 - Barge	V3 - Midsize Truck	C(C) - Explosive	AS - Active Shooter	T(C) - Cyber Insider		CO3 - Terrorist
A4 - Large Jet	AT4 - 9-16 Assailants	M4 - Deep Draft Ship	V4 - Large Truck (18 Wheeler)	C(P) - Pathogen		T(CU) - Cyber Outsider		CO4 - Foreign Intelligence Service
				C(R) - Radionuclide				
Random (Natural Disaster) Reference Threats by Hazard Category							Dependency & Proximity Threats	
Earthquake	Floods	Hurricanes	Ice Storms	Tornadoes	Wildfires	Dependency	Proximity	
EQ1 - PGA 0.0 - 0.2	F1 - 100 Year Flood	H1 - Category 1	I0 - Minimal Damage	T0 - Fujita 0	W1 - FRG1	D(T) - Transportation	D(P) - Proximity	
EQ2 - PGA 0.2 - 0.4	F2 - 500 Year Flood	H2 - Category 2	I1 - Isolated Outages	T1 - Fujita 1	W2 - FRG2	D(C) - Key Customers		
EQ3 - PGA 0.4 - .08		H3 - Category 3	I2 - Scattered Outages	T2 - Fujita 2	W3 - FRG3	D(E) - Key Employees		
EQ4 - PGA 0.8 - 1.1		H4 - Category 4	I3 - Numerous Outages	T3 - Fujita 3	W4 - FRG4	D(S) - Key Suppliers		
EQ5 - PGA > 1.1		H5 - Category 5	I4 - Prolonged Outages	T4 - Fujita 4	W5 - FRG5	D(U) - Utilities		
				I5 - Widespread Outages	T5 - Fujita 5			

For Task B-2, EEI will review relevant information from the Village and other sources, facilitate discussions, provide engineering support, and document decisions by the Steering Committee as necessary to complete the following tasks:

- a) EEI will describe the credible malevolent threats, natural hazards, and dependency hazards as necessary to convey the general threat level posed.
- b) EEI will develop and apply a ranking system to evaluate threat–asset pairs and make recommendations for bottom-cutting.
- c) EEI will identify which threats apply to which assets and rank the threat–asset pairs according to the judged magnitude of the resulting consequences.
- d) EEI will assist in selecting the critical threat–asset pairs to be included in the rest of the analysis process. In general, these threat–asset pairs are the objects of analysis throughout the rest of the process. It is anticipated that five (5) to ten (10) threat-asset pairs will be identified for further analysis.

### **Task B-3: Consequence Analysis**

This task identifies the worst reasonable consequences that can be caused by the specific threat-asset pairs identified in Task B-2. The consequence analysis will consider:

- Number of fatalities
- Number of serious injuries,
- Financial loss to the owners of the facility
- Economic losses to the community

The consequence analysis may be based upon reasonable estimates. Consequences relate to degradation in public confidence, environmental quality, the ability of civilian or military agencies to function, etc. using a qualitative, descriptive analyses.

For Task B-3, EEI will review relevant information from the Village and other sources, facilitate discussions, provide engineering support, and document decisions by the Steering Committee as necessary to complete the following tasks:

- a) Apply worst-reasonable-case assumptions for each threat critical threat-asset pair and document the assumptions for each case.
- b) Estimate the consequences in terms of loss of life and serious injury, financial losses to the Water Utility, duration and severity of service denial for the affected customers, and economic losses to society and the public.
- c) Document the specific assumptions and procedures used for performing this consequence analysis, the worst-reasonable-case assumptions, and the results of the consequence analysis.
- d) Record the consequence values for use in determining Risk and Resilience values (Task B-6).

### **Task B-4: Vulnerability Analysis**

This task analyzes the ability of each critical asset and its protective systems to withstand each specified threat. Vulnerability analysis for malevolent events estimates the likelihood that an adversary will be successful in executing a specific attack mode on an asset, given that the attack occurs. For natural hazards, dependency hazards, and proximity hazards, the vulnerability is the likelihood that, given the hazard occurs, the estimated consequences will ensue.

For Task B-4, EEI will review relevant information from the Village and other sources, facilitate discussions, provide engineering support, and document decisions by the Steering Committee as necessary to complete the following tasks:

- a) Review pertinent details of the facility construction, systems, and layout. Evaluate existing countermeasures, mitigation measures, and other impediments to threats. Evaluate information on interdependencies, personnel interactions, and identify vulnerabilities or weaknesses in the protection system.
- b) Analyze the vulnerability of each critical asset or system to estimate the likelihood that, given the occurrence of a threat, the consequences estimated will result.
- c) Document the method used for performing the vulnerability analysis, the worst-reasonable-case assumptions, and the results of the vulnerability analysis.
- d) Record the vulnerability estimates as point estimates. The likelihood of attack success will be expressed as a fraction representing the number of successes among attempts.

### **Task B-5: Threat Analysis**

This task estimates the likelihood of malevolent event, dependency/proximity hazard, or natural hazard. There are three methods allowed by the J-100 RAMCAP process. EEI will use the most appropriate method given the specific threat being analyzed.

For Task B-5, EEI will review relevant information from the Village and other sources, facilitate discussions, provide engineering support, and document decisions by the Steering Committee as necessary to complete the following tasks:

- a) Malevolent Threats. Estimate the likelihood of a malevolent event is based on the adversary's objectives and capabilities and the attractiveness of the region, facility, and threat-asset pair relative to alternative targets.
- b) Natural Hazards. Estimate the probability of natural hazards by drawing on the historical record for the specific location of the asset. The frequencies for various levels of severity of natural hazards will be estimated using published records for earthquakes, tornadoes, and floods.
- c) Dependency and Proximity Hazards. Estimate the likelihood of dependency hazards based on local historical records for the frequency, severity, and duration of service denials.
- d) Record Estimates. Record the method used for making the estimates and the estimates themselves, as either single-valued point estimates or ranges.

### **Task B-6: Risk and Resilience Analysis**

This task step combines the results from Tasks B-1 through B-5 into estimates of the Village's risk and resilience.

For Task B-6, EEI will review relevant information from the Village and other sources, facilitate discussions, provide engineering support, and document decisions by the Steering Committee as necessary to complete the following tasks:

- a) Calculate risk for each threat-asset pair as the product of the results from Consequence Analysis, Vulnerability Analysis, and Threat Analysis, using the following equation:
  - $Risk = Consequences \times Vulnerability \times Threat\ Likelihood = C \times V \times T$
  - Where: Consequences are as estimated in Task B-3, Vulnerability is as estimated in Task B-4, and Threat likelihood is as estimated in Task B-5.
- b) Calculate the current level of resilience.
  - i. The asset resilience metric is service denial due to a threat-asset pair, weighted by vulnerability and threat likelihood.
    - $Asset\ Resilience\ Metric = Duration \times Severity \times Vulnerability \times Threat\ Likelihood$
    - Where: Duration = the time period of service denial, in days
    - Severity = the amount of daily service denied, in gallons per day
    - Vulnerability and Threat Likelihood are as defined above.

- ii. The economic resilience metric is lost revenue to the utility owner due to the threat–asset pair. Lost revenue is asset resilience times the unit price of the service, where price is the pre-disruption price.
  - iii. The community economic resilience metric is the lost economic activity to the community served by the utility. For the community, the metric is the same as the economic loss to the community, estimated in Task B-3.
- c) Record the risk and resilience estimates for each threat–asset pair for use in Task B-7.

### **Task B-7 - Risk and Resilience Management**

Risk and resilience management is the deliberate process of deciding whether actions are needed to enhance security or resilience or both. It includes deciding on and implementing one or a portfolio of options to achieve an acceptable level of risk and resilience at an acceptable cost to the utility and the community.

For Task B-7, EEI will review relevant information from the Village and other sources, facilitate discussions, provide engineering support, and document decisions by the Steering Committee as necessary to complete the following tasks:

- a) Decide what risk and resilience levels are acceptable by examining the estimated results of the first six steps for each threat–asset pair. For those that are acceptable, document the decision. For those that are not acceptable, proceed to the next steps.
- b) Define countermeasure and mitigation/resilience options for those threat–asset pairs that are not acceptable.
- c) Estimate investment and operating costs of each option, being sure to include regular maintenance and periodic overhaul if expected. Adjust future costs to present value.
- d) Assess the options by analyzing the facility or asset under the assumption that the option has been implemented—revisiting all affected Tasks B-3 through B-6 to re-estimate the risk and resilience levels and calculating the estimated benefits of the option (the difference between the risk and resilience levels without the option and those with the option in place).
- e) Identify the options that have benefits that apply to multiple threat– asset pairs.
- f) Calculate the net benefits and benefit–cost ratio (and/or other criteria that are relevant in the utility’s resource decision-making) to estimate the total value and risk-reduction efficiency of each option.
- g) Review the options considering all the dimensions—fatalities, serious injuries, financial losses to the owner, economic losses to the community, and qualitative factors—and allocate resources to the selected options. Determine the resources—financial, human, and other—needed to operate the selected options.

### **Task B-8 - Risk and Resilience Assessment Documentation**

For Task B-8, EEI will document the procedures, findings, and results of the RRA process. The document will contain a description the results of Tasks B-1 through B-7, Stakeholder Workshop meeting attendees and minutes, a plan for implementing agreed upon operational and capital plans for decreasing risk and improving resilience.

## TASK C: EMERGENCY RESPONSE PLAN

### Task C-1 – Review Existing Emergency Response Plan

The American Water Infrastructure Act of 2018 requires all Community Water Supplies to update their ERPs to incorporate the results of the RRA (Task B). Specifically, the update must address the following:

- Strategies and resources to improve the resilience of the system, including the physical security and cybersecurity of the system;
- Plans and procedures that can be implemented, and identification of equipment that can be utilized, in the event of a malevolent act or natural hazard that threatens the ability of the community water system to deliver safe drinking water;
- Actions, procedures, and equipment which can obviate or significantly lessen the impact of a malevolent act or natural hazard on the public health and the safety and supply of drinking water provided to communities and individuals, including the development of alternative source water options, relocation of water intakes, and construction of flood protection barriers; and
- Strategies that can be used to aid in the detection of malevolent acts or natural hazards that threaten the security or resilience of the system.

For Task C-1, EEI will review the Village’s existing ERP and create a detailed plan for updating it to meet the requirements of the American Water Infrastructure Act of 2018.

### Task C-2: Draft Emergency Response Plan

For Task C-2, EEI will update the Village’s existing ERP incorporating the results of the RRA in accordance with the requirements of the American Water Infrastructure Act of 2018. The Draft ERP document will be submitted to the Village for review.

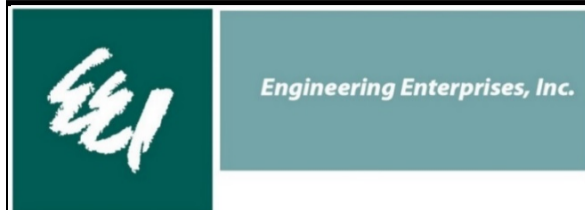
EEI will use the Community Water System Emergency Response Plan template provided by the EPA Office of Water (EPA 816-B-19-003) as the guiding document in preparing the ERP. The plan will include the sections shown on the table.

EEI will present the rationale and content of the ERP during a Stakeholder Workshop. EEI will resolve any issues identified during the workshop and incorporate the resolution in the Final ERP.

### Task C-3: Final Emergency Response Plan

For Task C-3, EEI will finalize the ERP ensuring that it meets all the requirements of the American Water Infrastructure Act of 2018 and prepare the Village’s final ERP.

UTILITY INFORMATION
i Utility Overview
ii Personnel Information
iii Primary Utility Components
iv Industry Chemical Handling and Storage Facilities
v Safety
vi Response Resources
vii Key Local Services
1 RESILIENCE STRATEGIES
1.1 Emergency Response Roles
1.2 Incident Command System (ICS) Roles
1.3 Communication
1.3.1 Internal Communication
1.3.2 External Response Partner Communication
1.3.3 Critical Customer Communication
1.3.4 Communication Equipment Inventory
1.4 Media Outreach
1.5 Public Notification Templates
2 EMERGENCY PLANS AND PROCEDURES
2.1 Core Response Procedures
2.2 Incident-Specific Response Procedures
3 MITIGATION ACTIONS
3.1 Alternative Source Water Options and Interconnected Utilities
3.2 Other Mitigation Actions
4 DETECTION STRATEGIES



**Attachment B:  
SCHEDULE**

**RISK AND RESILIENCE ASSESSMENT/EMERGENCY RESPONSE PLAN - WATER UTILITY  
VILLAGE OF ALGONQUIN, IL**

ITEM NO.	WORK ITEM	Month:	2020					2021									
			OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>TASK A: PROJECT ADMINISTRATION AND FACILITATION</b>																	
A-1	Project Administration																
A-1.1	Kick -Off Meeting																
A-2	Stakeholder Assistance & Workshops (2 Workshops)																
A-3	Steering Committee Work Session/Progress Mtgs. (5 Mtgs.)																
<b>TASK B: RISK AND RESILIENCE PLAN</b>																	
B-1	Asset Characterization (Tasks a-e)																
B-2	Threat Characterization (Tasks a-f)																
B-3	Consequence Analysis Tasks (a-e)																
B-4	Vulnerability Analysis (Tasks a-d)																
B-5	Threat Analysis (Tasks a-d)																
B-6	Risk and Resilience Analysis (Tasks a-c)																
B-7	Risk and Resilience Management (Tasks a-g)																
B-8	Risk and Resilience Assessment Documentation																
<b>TASK C: EMERGENCY RESPONSE PLAN</b>																	
C-1	Review Existing Emergency Response Plan																
C-2	Draft Emergency Response Plan																
C-3	Final Emergency Response Plan																

**Legend (lighter shades indicate preliminary work)**

	Project Administration Work Item(s)
	Stakeholder Workshops
	Steering Committee Meetings
	Risk and Resilience Assessment
	Emergency Response Plan



**Attachment C:**  
**ESTIMATED LEVEL OF EFFORT and COSTS FOR PROFESSIONAL ENGINEERING SERVICES**  
**RISK AND RESILIENCE ASSESSMENT/EMERGENCY RESPONSE PLAN - WATER UTILITY**  
**VILLAGE OF ALGONQUIN, IL**

DATE: 7/20/2020  
 ENTERED BY: TGH

WORK ITEM NO.	WORK ITEM	ENTITY:	EEI					WORK ITEM HOUR SUMM.	COST PER ITEM	
		PROJECT ROLE:	PRINCIPAL IN CHARGE	SENIOR PROJECT MANAGER	ENGINEER	TECHNICIAN	ADMIN.			
		HRLY RATE:	\$209	\$203	\$149	\$137	\$72			
<b>TASK A: PROJECT ADMINISTRATION AND FACILITATION</b>										
A-1	Project Administration and Kick-Off Meeting			4	4			8	\$1,409	
A-2	Stakeholder Assistance & Workshops (2 Workshops)			8	8		1	1	18	\$3,027
A-3	Steering Committee Assist. & Progress Mtgs. (5 Mtgs.)		1	20	20		2	2	45	\$7,672
<b>Project Administration and Facilitation Subtotal:</b>			1	32	32		3	3	71	\$12,109
<b>TASK B: RISK AND RESILIENCE PLAN</b>										
B-1	Asset Characterization (Tasks a-e)		1	8	12		2		23	\$3,899
B-2	Threat Characterization (Tasks a-f)			4	12		2		18	\$2,878
B-3	Consequence Analysis Tasks (a-e)			4	12				16	\$2,604
B-4	Vulnerability Analysis (Tasks a-d)			2	4				6	\$1,003
B-5	Threat Analysis (Tasks a-d)			2	4				6	\$1,003
B-6	Risk and Resilience Analysis (Tasks a-c)			2	4				6	\$1,003
B-7	Risk and Resilience Management (Tasks a-g)		1	8	16				25	\$4,222
B-8	Risk and Resilience Assessment Documentation		1	16	24		2	2	45	\$7,458
<b>Risk and Resilience Plan Subtotal:</b>			3	46	88		6	2	145	\$24,070
<b>TASK C: EMERGENCY RESPONSE PLAN</b>										
C-1	Review Existing Emergency Response Plan		-	4	4		2		10	\$1,683
C-2	Draft Emergency Response Plan		-	8	24				32	\$5,208
C-3	Final Emergency Response Plan		1	8	24		2	2	37	\$5,835
<b>Emergency Response Plan Subtotal:</b>			1	20	52		4	2	79	\$12,726
<b>PROJECT TOTAL:</b>			5	98	172		13	7	295	\$48,904

**Notes:**

Proposal assumes any technical support for the cybersecurity risk assessment will be provided by the Village's Information Services Department or other resources provided by the Village.

DIRECT EXPENSES	
Mileage =	\$0
Printing =	\$150
<b>DIRECT EXPENSES =</b>	<b>\$150</b>

LABOR EXPENSES	
Engineering Expenses =	\$46,619
Drafting Expenses =	\$1,781
Administrative Expenses =	\$505
<b>TOTAL LABOR EXPENSES =</b>	<b>\$48,904</b>

**TOTAL CONTRACT COSTS = \$49,054**





## Standard Schedule of Charges

January 1, 2020

<b>EMPLOYEE DESIGNATION</b>	<b>CLASSIFICATION</b>	<b>HOURLY RATE</b>
Senior Principal	E-4	\$214.00
Principal	E-3	\$209.00
Senior Project Manager	E-2	\$203.00
Project Manager	E-1	\$183.00
Senior Project Engineer/Planner/Surveyor II	P-6	\$172.00
Senior Project Engineer/Planner/Surveyor I	P-5	\$160.00
Project Engineer/Planner/Surveyor	P-4	\$145.00
Senior Engineer/Planner/Surveyor	P-3	\$133.00
Engineer/Planner/Surveyor	P-2	\$121.00
Associate Engineer/Planner/Surveyor	P-1	\$109.00
Senior Project Technician II	T-6	\$158.00
Senior Project Technician I	T-5	\$145.00
Project Technician	T-4	\$133.00
Senior Technician	T-3	\$121.00
Technician	T-2	\$109.00
Associate Technician	T-1	\$ 96.00
GIS Technician	G-1	\$ 90.00
Engineering/Land Surveying Intern	I-1	\$ 79.00
Administrative Assistant	A-3	\$ 70.00

### **VEHICLES, REPROGRAPHICS, DIRECT COSTS, DRONE AND EXPERT TESTIMONY**

Vehicle for Construction Observation		\$ 15.00
In-House Scanning and Reproduction	\$0.25/Sq. Ft. (Black & White) \$1.00/Sq. Ft. (Color)	
Reimbursable Expenses (Direct Costs)	Cost	
Services by Others (Direct Costs)	Cost + 10%	
Unmanned Aircraft System / Unmanned Aerial Vehicle / Drone		\$ 200.00
Expert Testimony		\$ 250.00



# American Water Infrastructure Act (AWIA) Risk and Resilience Assessment Case Studies Using the J-100 AWWA Consensus Standard



April 28, 2020



# Today's Webinar Presenters



Kamelia Afshinnia, Ph.D.  
Project Engineer



Michele Piotrowski, P.E., LEED AP  
Sr. Project Manager and Principle



Tim Holdeman  
Director of Business Development



# Outline



- ❑ Background –
  - American Water Infrastructure Act (AWIA)
  - Resources
- ❑ J-100 RAMCAP Methodology
  - 7-Step Process
  - Case Studies Mixed-In Throughout
- ❑ Questions





# American Water Infrastructure Act (AWIA) of 2018



- Conduct **Risk and Resilience Assessment (RRA)**
- Prepare **Emergency Response Plan (ERP)**
- Coordination with Local Emergency Planning Committee (LEPC) and Others

## Compliance Schedule for Risk and Resilience Assessment

<i>Population served</i> <b>≥100,000</b>	<i>Population served</i> <b>50,000-99,999</b>	<i>Population served</i> <b>3,301-49,999</b>
March 31, 2020 	December 31, 2020 	June 30, 2021 

## Emergency Response Plans

- Certify ERP not later than 6 months after completion of the RRA



# Risk and Resilience Assessment



Such an assessment—

- A) Shall include an **assessment of**—
  - i) the **risk to** the system from malevolent acts and natural hazards;
  - ii) the **resilience of** the pipes and constructed conveyances, physical barriers, source water, water collection and intake, pretreatment, treatment, storage and distribution facilities, electronic, computer, or other automated systems (including the security of such systems) which are utilized by the system;
  - iii) the monitoring practices of the system;
  - iv) the financial infrastructure of the system;
  - v) the use, storage, or handling of chemicals by the system; and
  - vi) the operation and maintenance of the system; and
- B) May include an evaluation of capital and operational needs for risk and resilience management for the system.



# Risk



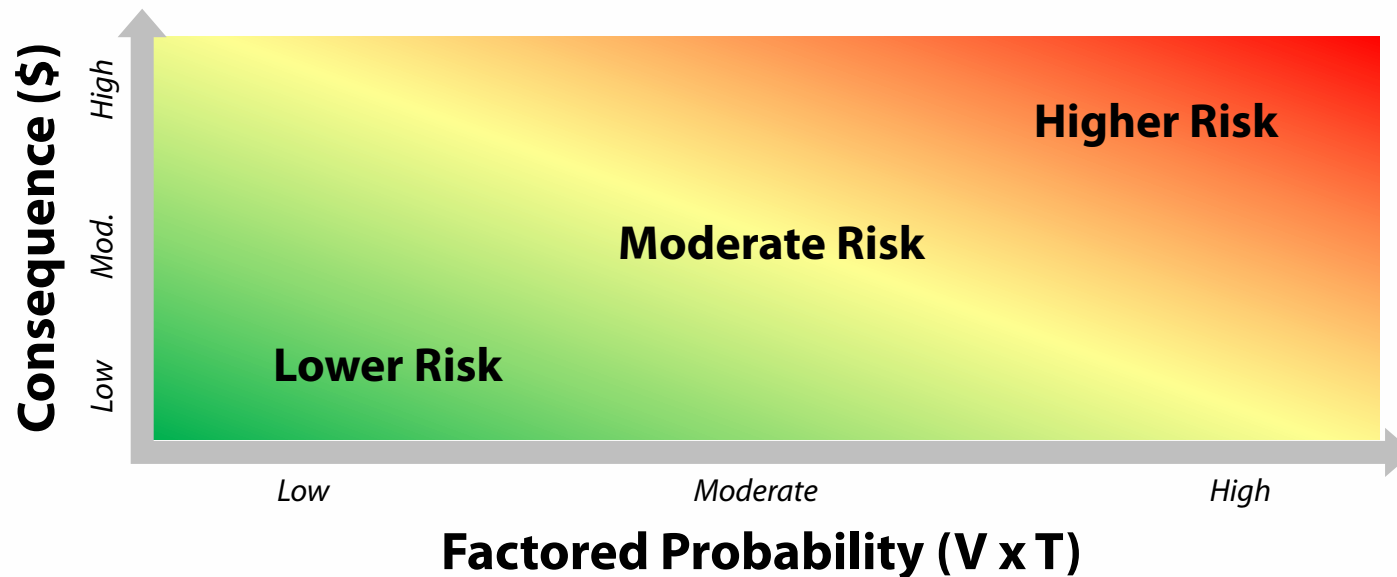
**Risk** - the probably of an event (threat) to produce a significant negative outcome.

$$\mathbf{Risk = C \times (V \times T)}$$

C, Consequences = total economic impact (in dollars)

V, Vulnerability = likelihood of consequences (0-1)

T, Threat likelihood = probability of threat (# of times / # of years)





# Resilience

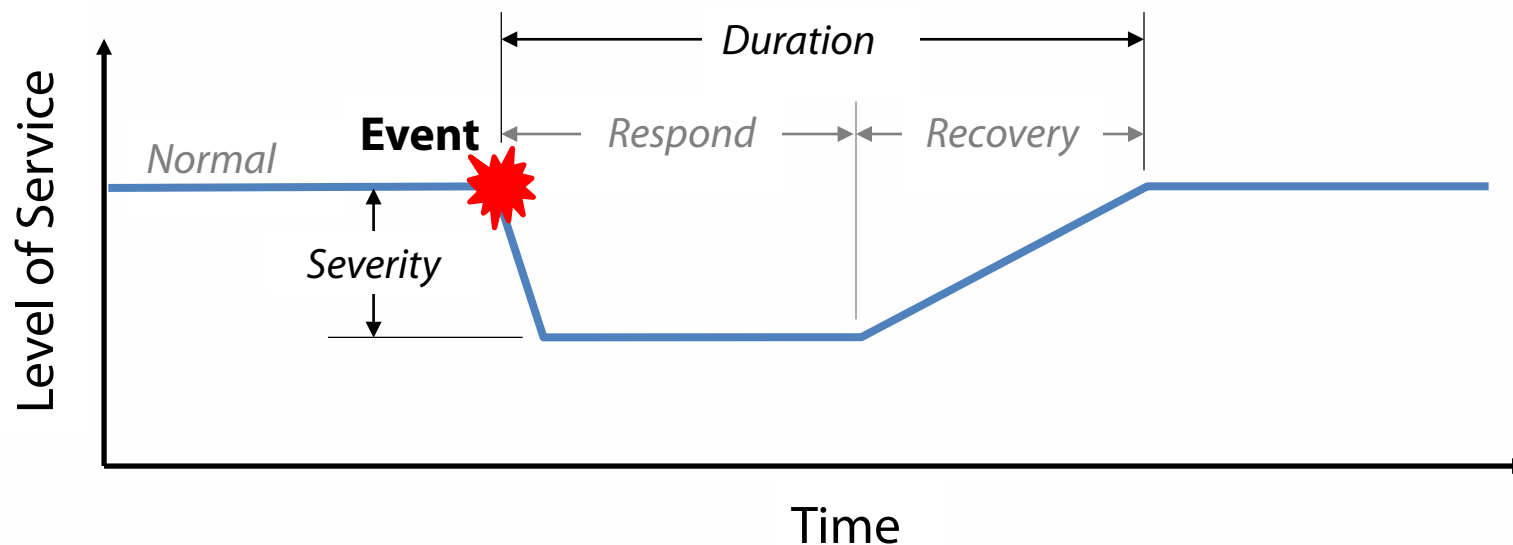


**Resilience** - the ability of an asset to avoid, or withstand and recover from a threat.

$$\text{Resilience} = D \times S \times (V \times T)$$

D, Duration = the time period of service denial (in days)

S, Severity = the amount of daily service denied (% of population served)







# Resources



## Training




United States  
Environmental Protection  
Agency

[www.epa.gov](http://www.epa.gov)



## References

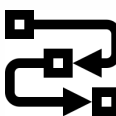


American Water Works  
Association

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



## Data



## Processes



## Computerized Systems



## Utility Risk & Resilience Certificate Program (10hrs)

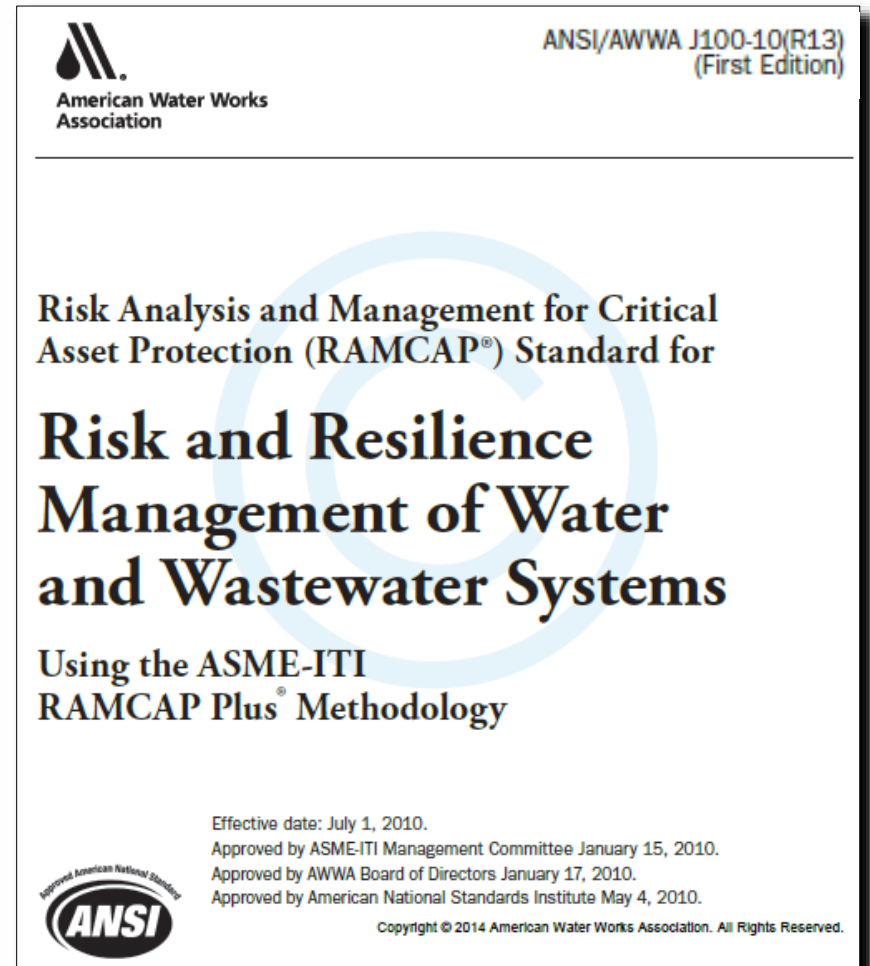
- Facilitating Compliance with America's Water Infrastructure Act of 2018 (EL260)
- Security Practices for Operations and Management (EL261)
- Risk and Resilience of Water and Wastewater Systems (EL262)
- Emergency Planning (EL263)
- Cybersecurity in the Water Sector (EL264)



# J-100 RAMCAP Plus



- J-100 RAMCAP Plus
- Uniform risk/resilience analysis methodology that provides:
  - Common Terminology, Metrics, Process, and Scenarios
  - Consistent Results
  - Basis for Comparisons





# J-100 RAMCAP Plus Process



**1 ASSET CHARACTERIZATION –**  
What are the critical assets?

Operational Performance Goals  
**Supply, Pressure, Quality ...**  
Minimum Acceptable Levels

Assets required to fulfill our mission

**2 THREAT CHARACTERIZATION –**  
What are the credible threats?

Reference Threats (partial)		
Malevolent	Natural	Dependency
Assault	Snow & Ice	Utilities
Contamination	Earthquakes	Suppliers
Theft	Tornadoes	Employees
Cyber Attack	Hurricanes	Transportation
Sabotage	Wildfires	Customers

Threats that can impair critical assets

**2.5 QUALITATIVE SCORING**

		THREAT CREDIBILITY		
		HIGH	MOD	LOW
ASSET CRITICALITY	HIGH			
	MOD			
	LOW			

Engineering Enterprises, Inc.

**7 RISK/RESILIENCE MANAGEMENT**  
What R/R is acceptable?  
Identify mitigation options  
Estimate Risk/Resilience Improvement  
Evaluate, Select, and Plan for Implementation

**6**

$$RISK = C * V * T$$

$$RESILIENCE = V * T * S * D$$

**5 SEVERITY AND DURATION**  
Service Interruption –  
How Many? How Long?

**4 THREAT LIKELIHOOD (#/Y)**  
How often will the threat occur?

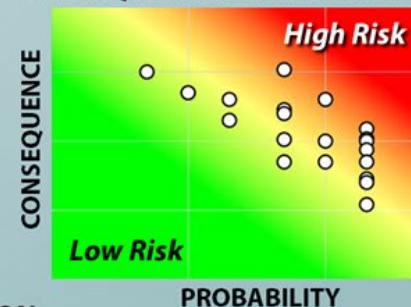
**3 VULNERABILITY ANALYSIS**  
What is our exposure to the threat?

**CONSEQUENCE ANALYSIS (\$)**  
Financial Impacts – Utility/Region

**WORST REASONABLE CONSEQUENCES**

**BOTTOM CUTTING**

**PREL. QUANTITATIVE SCORING**



**RISK REDUCTION / RESILIENCE ENHANCEMENT PLAN**

**PRIORITIZATION**

Engineering Enterprises, Inc.



# Using J-100 for AWIA Compliance



<b>AWIA</b>	<b>J100</b>
<b>Risks From Malevolent Acts and Natural Hazards</b>	<b>Risk and Resilience Analysis Steps Using Reference Threats</b>
<b>Resilience of System Components</b>	- Risk Calculations
<b>Financial Infrastructure</b>	- Resilience Calculations
<b>Monitoring Practices</b>	<b>Evaluated during Consequence and Vulnerability Analysis</b>
<b>Use, Storage, and Handling of Chemicals</b>	
<b>Operation and Maintenance</b>	
<b>Evaluation of Capital and Operational Needs</b>	<b>Risk and Resilience</b>
	- Net Benefits
	- Benefit/Cost Ratio





# RRA Project Team (Typical)



**Project Champion**  
*Leadership*

**Superintendent**

**Steering Committee**  
*Decisions / Consensus*

**Production  
Supervisor**

**Distribution  
Supervisor**

**Water Quality  
Supervisor**

**Stakeholder Group**  
*Expertise / Advice*

**IT**

**LEPC**

**FD**

**PD**

**FIN**

**PW**

# Overall Project Goals



## ***Examples of Desired Outcomes:***

- *Organizational Preparedness*
- *Power Outage Response Protocols*
- *Contingency Plan for Loss of Key Employees*
- *Improve Communication*



# 1 Asset Characterization



**1 ASSET CHARACTERIZATION –**  
What are the critical assets?



Operational Performance Goals  
**Supply, Pressure, Quality ...**  
Minimum Acceptable Levels

Assets required to fulfill our mission

**2 THREAT CHARACTERIZATION –**  
What are the credible threats?

Reference Threats (partial)

Malevolent	Natural	Dependency
Assault	Snow & Ice	Utilities
Contamination	Earthquakes	Suppliers
Theft	Tornadoes	Employees
Cyber Attack	Hurricanes	Transportation
Sabotage	Wildfires	Customers

Threats that can impair critical assets

**2.5 QUALITATIVE SCORING**  
**THREAT CREDIBILITY**

		HIGH	MOD	LOW
ASSET CRITICALITY	HIGH			
	MOD			
	LOW			

Engineering Enterprises, Inc.

**7 RISK/RESILIENCE MANAGEMENT**  
What R/R is acceptable?  
Identify mitigation options  
Estimate Risk/Resilience Improvement  
Evaluate, Select, and Plan for Implementation



Engineering Enterprises, Inc.

**RISK REDUCTION / RESILIENCE ENHANCEMENT PLAN**

$$RISK = C * V * T$$

$$RESILIENCE = V * T * S * D$$

**6**

**SEVERITY AND DURATION**

Service Interruption –  
How Many? How Long?

**5**

**THREAT LIKELIHOOD (#/Y)**

How often will the threat occur?

**4**

**VULNERABILITY ANALYSIS**

What is our exposure to the threat?

**3**

**CONSEQUENCE ANALYSIS (\$)**

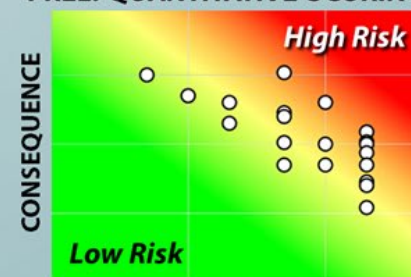
Financial Impacts – Utility/Region

**WORST REASONABLE CONSEQUENCES**



**BOTTOM CUTTING**

**PREL. QUANTITATIVE SCORING**



**PRIORITIZATION**

Engineering Enterprises, Inc.





# What is a Critical Asset?



- Assets that, if compromised, could result in **prolonged or widespread service interruption** or degradation, injuries, fatalities, and/or **detrimental impact**.
- Critical if **utility mission is significantly degraded** if the asset is lost or unavailable

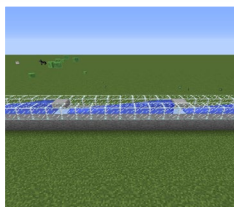




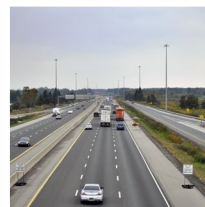
# AWIA List of Critical Components



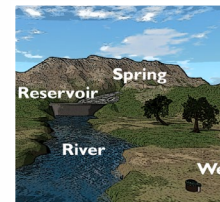
**Pipes**



**Constructed Conveyances**



**Physical Barriers**



**Source Water**



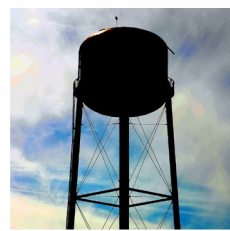
**Raw Water Collection and Intake**



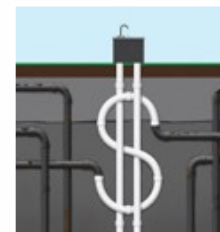
**Pretreatment**



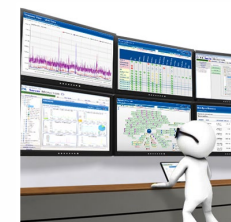
**Treatment**



**Storage and Distribution Facilities**



**Financial Infrastructure**



**Monitoring Systems**



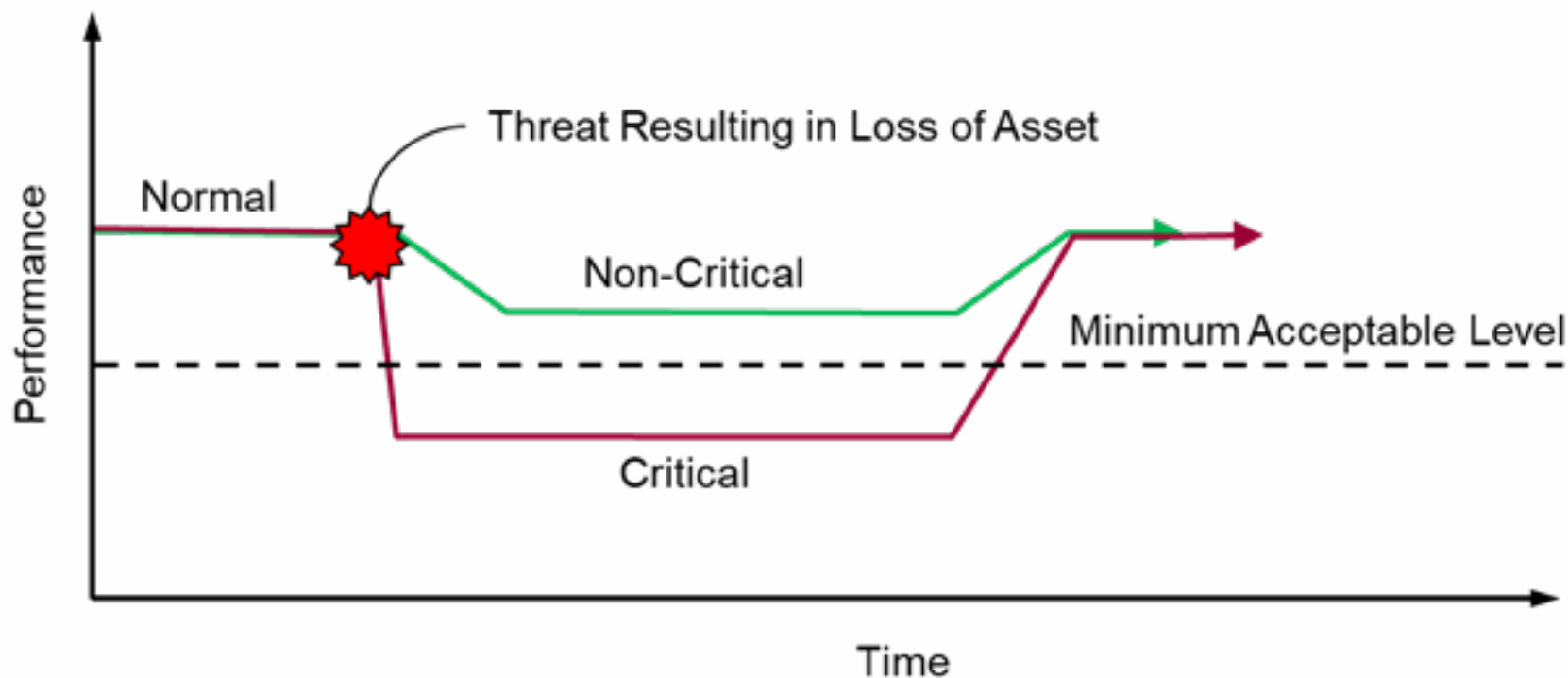
**Electronic, Computer, and Other Automated Systems**



# Minimum Acceptable Levels



Minimum Acceptable Levels – the lowest level of performance at which the utility can accomplish its mission.





# Minimum Acceptable Operational Levels



<b>Water Production</b>	Zone	GPM	MGD
	West	1760	2.5
	Central	6305	9.1
	East	6014	8.7
	East High	<u>1660</u>	<u>2.4</u>
	TOTAL	15739	22.7
<b>Service Pressure</b>	PSI	Level of Concern	
	> 40 PSI	Normal	
	< 40 > 30	Cautionary	
	< 30 > 20	Elevated	
	< 20	High	
<b>Water Quality</b>	Complaints	Level of Concern	Comment
	> 2 Complaints	Cautionary	Over short period
	> 5 Complaints	High	Concerning one issue
<b>Service Interruptions</b>	Customers Affected	Duration	Level of Concern
	> 15 < 30	> 4 < 8 hours	Cautionary
	> 30	> 8 hours	High
<b>Critical Customers</b>	Tier	Number	Comments
	1 - Most Critical	4 Locations	Hospitals
	2 - More Critical	8 Locations	Dialysis Centers
		Several	Clinics
3 - Critical	Several	Dental, Large Housing, Industrial	
<b>Financials Systems</b>	If out-of-service for more than 2 weeks - High Level of Concern		



# Well Criticality



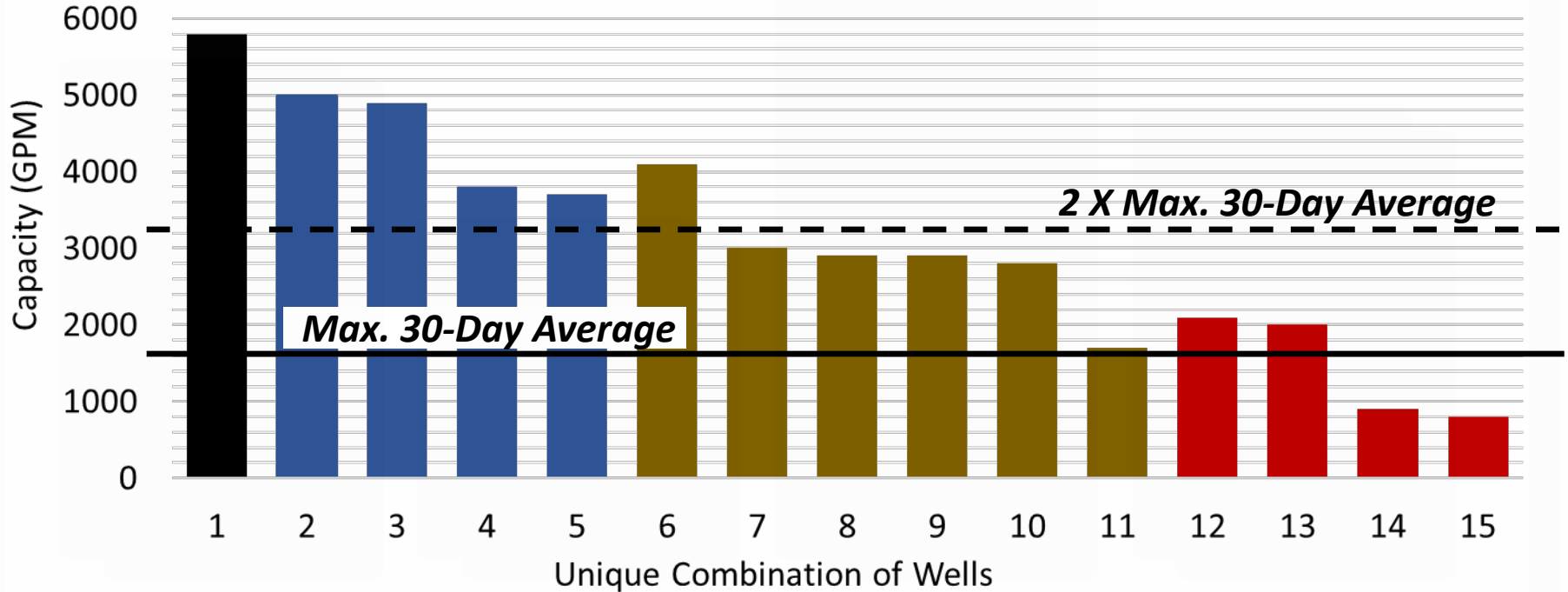
CITY OF ROCKFORD WATER SUPPLY WELL CRITICALITY EVALUATION	<b>SITE / ZONE</b>	Hydraulic Zone Site
	<b>WELL USAGE</b>	Avg Daily (GPM) last 4 years
		Avg Daily of Zone (GPM) last 4 years
		% of ZoneAvg Daily (GPM) last 4 years
	<b>BOOSTER CAPACITY</b>	Capacity (GPM) Smallest Booster
		Pressure Zone Capacity
		% of Pressure Zone Capacity
	<b>TREATMENT</b>	Treatment
	<b>BOOSTER REDUNDANCY</b>	Total Booster Capacity
		Number of Booster Pumps
	<b>STORAGE</b>	Storage
	<b>ELECTRICAL BACKUP</b>	Emergency Back-up
		SCORE
	<b>RELIABILITY</b>	Reliability (Age / Condition)
	<b>RESISTANCE</b>	Resistance, Physical
	<b>MISCELLANEOUS</b>	Resistance, Drought
		Interzone Transfer
		Flood Hazard
Other		
<b>RANKING</b>	<b>TOTAL SCORE</b>	
	Overall Priority	
	Overall Rank	
	Rank by Zone	



# Well Criticality Example



## Well Criticality



No.	GPM	1 Well OSS				2 Wells OOS					3 Wells OOS				
Well 1	800		800	800	800				800	800	800				800
Well 2	900	900		900	900		900	900			900			900	
Well 3	2000	2000	2000		2000	2000		2000		2000			2000		
Well 4	2100	2100	2100	2100		2100	2100		2100			2100			
TOTAL	5800	5000	4900	3800	3700	4100	3000	2900	2900	2800	1700	2100	2000	900	800






# 2 Threat Characterization



**1 ASSET CHARACTERIZATION –**  
What are the critical assets?



Operational Performance Goals  
**Supply, Pressure, Quality ...**  
Minimum Acceptable Levels  
Assets required to fulfill our mission

**2 THREAT CHARACTERIZATION –**  
What are the credible threats?

**Reference Threats (partial)**

Malevolent	Natural	Dependency
Assault	Snow & Ice	Utilities
Contamination	Earthquakes	Suppliers
Theft	Tornadoes	Employees
Cyber Attack	Hurricanes	Transportation
Sabotage	Wildfires	Customers

Threats that can impair critical assets

**2.5 QUALITATIVE SCORING**

**THREAT CREDIBILITY**

	HIGH	MOD	LOW
ASSET CRITICALITY HIGH			
MOD			
LOW			

Engineering Enterprises, Inc.

**7 RISK/RESILIENCE MANAGEMENT**  
What R/R is acceptable?  
Identify mitigation options  
Estimate Risk/Resilience Improvement  
Evaluate, Select, and Plan for Implementation

**6**

$$RISK = C * V * T$$

$$RESILIENCE = V * T * S * D$$

**5 SEVERITY AND DURATION**  
Service Interruption –  
How Many? How Long?

**4 THREAT LIKELIHOOD (#/Y)**  
How often will the threat occur?

**3 VULNERABILITY ANALYSIS**  
What is our exposure to the threat?

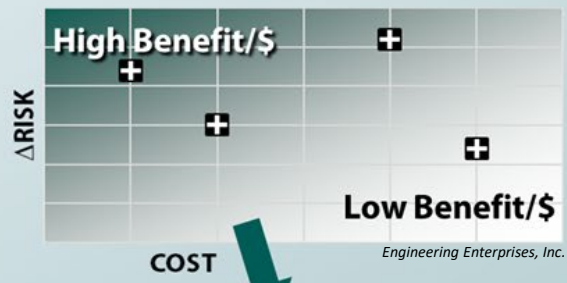
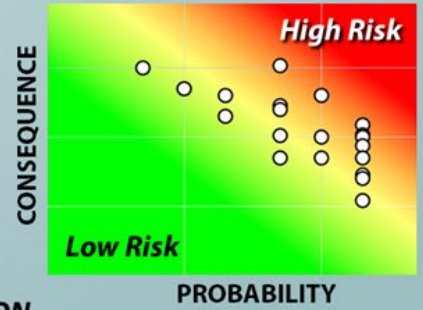
**CONSEQUENCE ANALYSIS (\$)**  
Financial Impacts – Utility/Region

**WORST REASONABLE CONSEQUENCES**



**BOTTOM CUTTING**

**PREL. QUANTITATIVE SCORING**



**RISK REDUCTION / RESILIENCE ENHANCEMENT PLAN**

**PRIORITIZATION**

Engineering Enterprises, Inc.



# Reference Threats



**Malevolent Threats** – perpetrator(s) seek to damage or destroy an asset to inhibit its ability to function



**Natural Hazards** – threats posed by nature able to degrade the function of an asset



**Dependency and Proximity Hazards** – threats due to depravation of key inputs or outputs / threats posed by co-location with other assets







# Reference Threats



## Threat Categories

### Natural Hazards

- Hurricanes
- Earthquakes
- Tornadoes/Straight Line Winds
- Floods
- Wildfires
- Extreme Cold, Snow & Ice Storms

### Dependency and Proximity Hazards

- Utilities
- Key suppliers
- Key employees
- Key customers
- Transportation
- Proximity

### Malevolent Acts (EPA Threat Categories)

- Assault on Utility – Physical
- Contamination of Finished Water – Accidental\*
- Contamination of Finished Water – Intentional
- Theft or Diversion – Physical
- Cyber Attack on Business Enterprise Systems
- Cyber Attack on Process Control Systems
- Sabotage – Physical
- Contamination of Source Water – Accidental\*
- Contamination of Source Water – Intentional

\*Accidental contamination threat categories are not malevolent acts but are included here due to similar potential consequences.

## J100 Reference Threats

Malevolent Threats by Threat Category								
Aircraft	Assault Team	Maritime	Vehicle Borne Bomb	Contamination of Product	Directed / Sabotage	Theft or Diversion	Cyber Insider	Cyber Outsider
A1 - Helicopter	AT1 - 1 Assailant	M1 - Small Boat	V1 - Car	C(B) - Biotxin	S(P) – Physical Insider	T(P) – Physical Insider	C11 - Insider	CO1 - Cyber Outsider Attackers
A2 - Small Plane	AT2 - 2-4 Assailants	M2 - Fast Boat	V2 - Van	C(C) - Chemical	S(PU) – Physical Outsider	T(PU) – Physical Outsider	C12 - Trusted Insider / Accidental	CO2 - Criminal Group
A3 - Regional Jet	AT3 - 5-8 Assailants	M3 - Barge	V3 - Midsize Truck	C(C) - Explosive	AS - Active Shooter	T(CI) - Cyber Insider		CO3 - Terrorist
A4 - Large Jet	AT4 - 9-16 Assailants	M4 - Deep Draft Ship	V4 - Large Truck (18 Wheeler)	C(P) - Pathogen		T(CU) - Cyber Outsider		CO4 - Foreign Intelligence Service
				C(R) - Radionuclide				
Random (Natural Disaster) Reference Threats by Hazard Category							Dependency & Proximity Threats	
Earthquake	Floods	Hurricanes	Ice Storms	Tornadoes	Wildfires	Dependency	Proximity	
EQ1 - PGA 0.0 - 0.2	F1 - 100 Year Flood	H1 - Category 1	I0 - Minimal Damage	T0 - Fujita 0	W1 - FRG1	D(T) - Transportation	D(P) - Proximity	
EQ2 - PGA 0.2 - 0.4	F2 - 500 Year Flood	H2 - Category 2	I1 - Isolated Outages	T1 - Fujita 1	W2 - FRG2	D(C) - Key Customers		
EQ3 - PGA 0.4 - .08		H3 - Category 3	I2 - Scattered Outages	T2 - Fujita 2	W3 - FRG3	D(E) - Key Employees		
EQ4 - PGA 0.8 - 1.1		H4 - Category 4	I3 - Numerous Outages	T3 - Fujita 3	W4 - FRG4	D(S) - Key Suppliers		
EQ5 - PGA > 1.1		H5 - Category 5	I4 - Prolonged Outages	T4 - Fujita 4	W5 - FRG5	D(U) - Utilities		
			I5 - Widespread Outages	T5 - Fujita 5				



## Baseline Information on Malevolent Acts for Community Water Systems



<b>Man-made or Accidental Hazards (9)</b>	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	Ttl	3	2	1	Ttl
Assault on Utility – Physical			1			1			1			1			1	0	3	2	5	0	6	2	8
Contamination of Finished Water – Accidental		1			1			1			1			1		3	1	1	5	9	2	1	12
Contamination of Finished Water – Intentional			1		1			1			1			1		3	0	2	5	9	0	2	11
Theft or Diversion – Physical			1			1			1			1			1	0	3	1	4	0	6	1	7
Cyber Attack on Business Enterprise Systems	1				1			1			1			1		1	4	0	5	3	8	0	11
Cyber Attack on Process Control Systems	1				1			1			1			1		3	2	0	5	9	4	0	13
Sabotage – Physical			1		1			1			1			1		3	0	2	5	9	0	2	11
Contamination of Source Water – Accidental	1				1			1			1			1		2	2	1	5	6	4	1	11
Contamination of Source Water – Intentional			1		1				1			1		1		1	2	2	5	3	4	2	9
<b>Natural Hazards (6)</b>																							
Hurricanes			1			1			1			1			1	0	0	0	0	0	0	0	0
Earthquakes			1		1				1			1		1		1	0	4	5	3	0	4	7
Tornadoes, Straight Line Winds	1				1			1			1			1		3	2	0	5	9	4	0	13
Floods	1				1			1			1	1		1		2	1	2	5	6	2	2	10
Drought	1				1			1			1			1		1	4	0	5	3	8	0	11
Wildfires			1			1			1			1			1	0	0	0	0	0	0	0	0
Extreme Cold, Snow & Ice Storms		1			1				1			1		1		1	2	2	5	3	4	2	9
<b>Dependency (5)</b>																							
Utilities (ComEd, et al.)	1				1			1			1			1		3	2	0	5	9	4	0	13
Key suppliers	1				1			1			1			1		2	2	1	5	6	4	1	11
Key employees		1			1			1			1			1		0	2	3	5	0	4	3	7
Transportation Network		1			1			1			1			1		1	1	3	5	3	2	3	8
Proximity			1			1			1			1			1	0	1	3	4	0	2	3	5

# 2.5 Threat /Asset Pair Qualitative Analysis



**1 ASSET CHARACTERIZATION –**  
What are the critical assets?

Operational Performance Goals  
**Supply, Pressure, Quality ...**  
Minimum Acceptable Levels

Assets required to fulfill our mission

**2 THREAT CHARACTERIZATION –**  
What are the credible threats?

Reference Threats (partial)		
Malevolent	Natural	Dependency
Assault	Snow & Ice	Utilities
Contamination	Earthquakes	Suppliers
Theft	Tornadoes	Employees
Cyber Attack	Hurricanes	Transportation
Sabotage	Wildfires	Customers

Threats that can impair critical assets

**2.5 QUALITATIVE SCORING**

		THREAT CREDIBILITY		
		HIGH	MOD	LOW
ASSET CRITICALITY	HIGH			
	MOD			
	LOW			

Engineering Enterprises, Inc.

WORST REASONABLE CONSEQUENCES

**BOTTOM CUTTING**

**PREL. QUANTITATIVE SCORING**

CONSEQUENCE

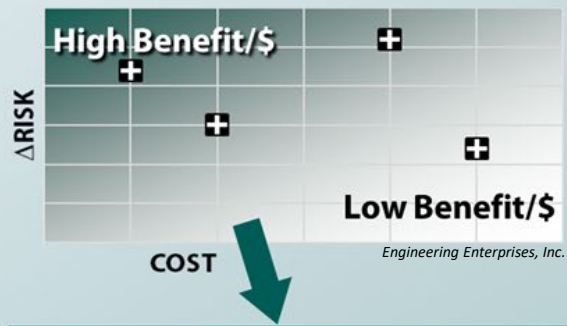
PROBABILITY

High Risk

Low Risk

Engineering Enterprises, Inc.

**7 RISK/RESILIENCE MANAGEMENT**  
What R/R is acceptable?  
Identify mitigation options  
Estimate Risk/Resilience Improvement  
Evaluate, Select, and Plan for Implementation



**6**

$RISK = C*V*T$   
 $RESILIENCE = V*T*S*D$

**5 SEVERITY AND DURATION**  
Service Interruption –  
How Many? How Long?

**4 THREAT LIKELIHOOD (#/Y)**  
How often will the threat occur?

**3 VULNERABILITY ANALYSIS**  
What is our exposure to the threat?

**CONSEQUENCE ANALYSIS (\$)**  
Financial Impacts – Utility/Region

**RISK REDUCTION / RESILIENCE ENHANCEMENT PLAN**

**PRIORITIZATION**



# Threat / Asset Pairs



## Credible Threats

		HIGH									MODERATE				LOW							
<b>Critical Assets</b>	<b>HIGH</b>																					





# Screen Threat / Asset Pairs



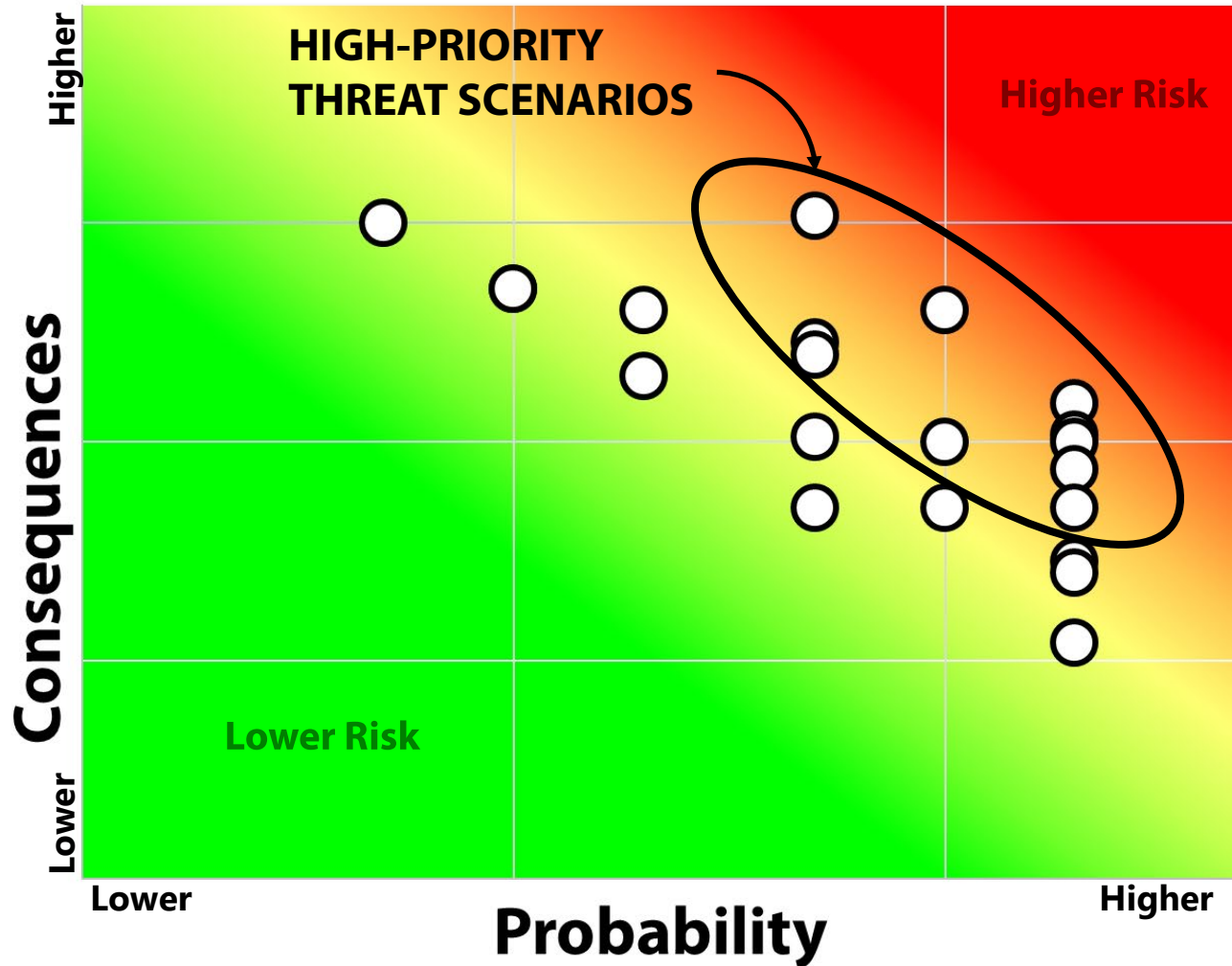
## Preliminary Qualitative Assessment of “Worst Reasonable Consequence”

- 1) Establish Consequence and Probability Criteria
- 2) Score T/A Pairs
- 3) Prioritize Based on Scoring and Bottom-Cut
- 4) Select Threat / Asset Pairs for Further Evaluation





# Preliminary Risk Ranking





# J-100 Summary Table



J-100 Step	Water Utility A	Water Utility B	Water Utility C
1) Critical Assets	18	17	9
2) Credible Threats	21	20	23
2.5) Threat / Asset Pairs	378 → 26	340 → 20	252 → 6
Preliminary Qualitative Analysis	11	13	6
3) - 6) Risk and Resilience			
7) Management Analysis - Mitigation Options			





# 3, 4, and 5 Quantitative Analysis



**1 ASSET CHARACTERIZATION –**  
What are the critical assets?

Operational Performance Goals  
**Supply, Pressure, Quality ...**  
Minimum Acceptable Levels

Assets required to fulfill our mission

**2 THREAT CHARACTERIZATION –**  
What are the credible threats?

Reference Threats (partial)		
Malevolent	Natural	Dependency
Assault	Snow & Ice	Utilities
Contamination	Earthquakes	Suppliers
Theft	Tornadoes	Employees
Cyber Attack	Hurricanes	Transportation
Sabotage	Wildfires	Customers

Threats that can impair critical assets

**2.5 QUALITATIVE SCORING**

		THREAT CREDIBILITY		
		HIGH	MOD	LOW
ASSET CRITICALITY	HIGH			
	MOD			
	LOW			

**7 RISK/RESILIENCE MANAGEMENT**  
What R/R is acceptable?  
Identify mitigation options  
Estimate Risk/Resilience Improvement  
Evaluate, Select, and Plan for Implementation

**6**

$$RISK = C * V * T$$

$$RESILIENCE = V * T * S * D$$

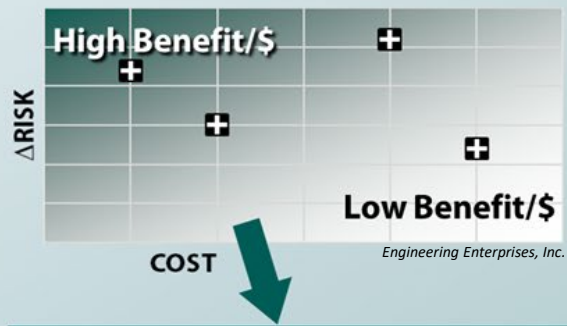
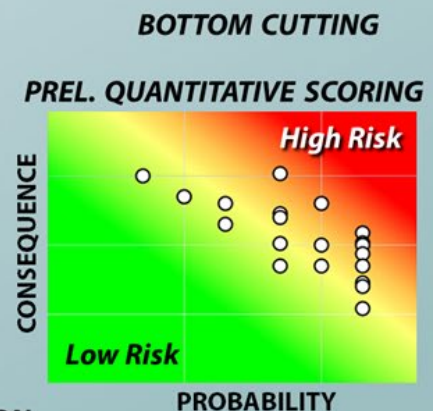
**WORST REASONABLE CONSEQUENCES**

**5 SEVERITY AND DURATION**  
Service Interruption – How Many? How Long?

**4 THREAT LIKELIHOOD (#/Y)**  
How often will the threat occur?

**3 VULNERABILITY ANALYSIS**  
What is our exposure to the threat?

**CONSEQUENCE ANALYSIS (\$)**  
Financial Impacts – Utility/Region



**RISK REDUCTION / RESILIENCE ENHANCEMENT PLAN**

**PRIORITIZATION**



# Quantitative Analysis



$$\text{Risk} = \mathbf{C} \times (\mathbf{V} \times \mathbf{T})$$

C, Consequences = total economic impact (in dollars)

V, Vulnerability = likelihood of consequences (0-1)

T, Threat likelihood = probability of threat (# / year)

$$\text{Resilience} = \mathbf{D} \times \mathbf{S} \times (\mathbf{V} \times \mathbf{T})$$

D, Duration = the time period of service denial (in days)

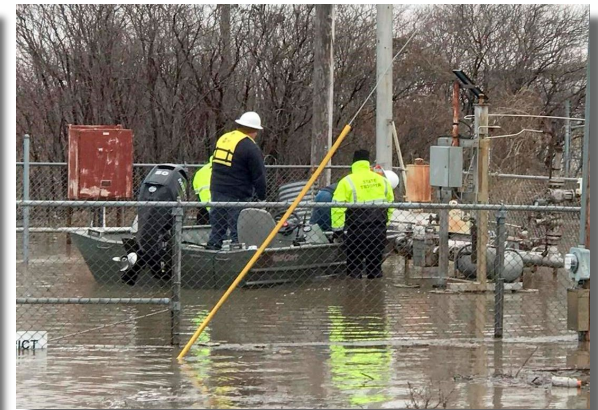
S, Severity = the amount of daily service denied (% of population served)



# Consequence Analysis



- Identify, Estimate Worst Reasonable Consequences
- Resulting from Specific Threat-Asset Pairs
- Requires a Review of:
  - Facility Design, Layout, and Operation





# Consequence Analysis



## Consequence Analysis Should Consider:

- Fatalities
- Financial Loss to Utility
- Service Denial (%)
- Serious Injuries
- Regional Economic Impact
- Duration (Days)





# Fatalities and Serious Injuries



Express these consequences in two ways:

- Numbers of impacted individuals, and
- Then in terms of dollars, by using the number of impacted individuals x the value of a statistical life.

Always report these results  
two ways:

- Always use numbers of impacted individuals to emphasize tragic human impacts - never lose sight of these serious human impacts
- Dollar values to calculate financial consequence and conduct cost/benefit analyses







# Financial Loss to Utility



- Financial Loss to Utility
  - Demolition and Disposal
  - Repair and Replacement
  - Interim Measure
  - Final Solution
  - Legal Liabilities
  - Environmental Remediation
  - Loss of revenue when you can't bill your customers for days when you weren't providing them water





# Regional Economic Impact



Regional economic impact resulting from:

- Actual water disruptions or water quality issues
- Threats or negative media that lead to loss of public confidence.

Impacted sectors

- Manufacturing, retail sales, tourism, hotels, restaurants, etc.

Example

- Contamination of source water-Accidental
- Regional economic impact: \$3.5 M (Assumption: Normal retail, hotel and restaurant activity will be reduced by 25% over a 3-day period (Average of \$28 M /week, The United States Census Bureau.)





# Other Considerations



- Service Denial (% Affected)
- Duration of Water Outage
- Monitoring
- Use, Storage and Handling of Chemicals
- Operation & Maintenance







# Vulnerability Analysis



**Vulnerability Analysis:** estimates the likelihood that each specific threat or hazard, given that it occurs, will overcome any defenses and cause the estimated consequences.

Malevolent acts – estimate the likelihood that an adversary will be successful in executing a specific attack mode on an asset, given that the attack occurs.



Natural hazards, Dependency hazards, and Proximity hazards – estimate the likelihood that the estimated consequences will ensue, given the hazard occurs.



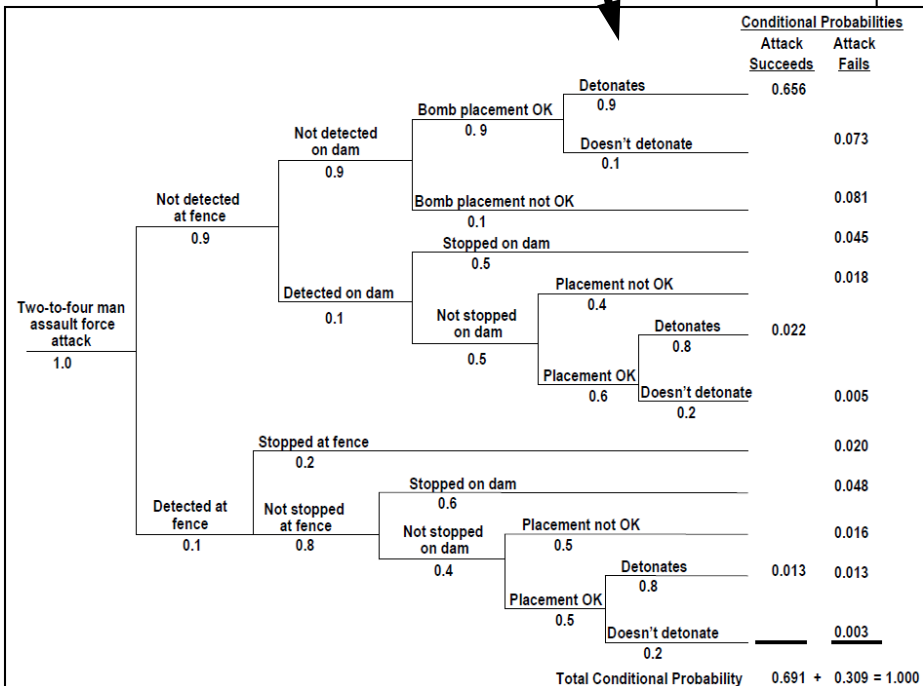
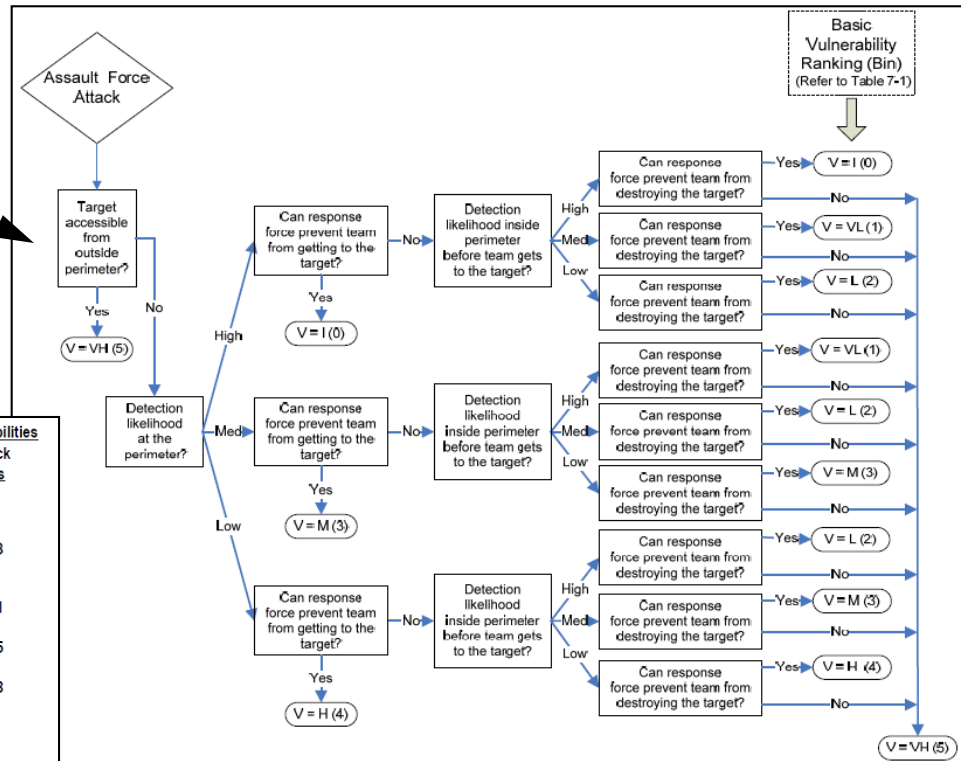




# Vulnerability Analysis Method



- Direct Expert Elicitation
- Vulnerability Logic Diagram
- Event Tree Method
- Hybrid





# Considerations



## Detect

- Ability to detect that an accident is occurring

## Deter

- Discourage unauthorized people from attempting to gain unauthorized access to your facility

## Delay

- Ability to impede an adversary's penetration into the facility

## Respond

- Ability to respond to the adversary's activity
- Ability to interrupt the attack after detection



# Vulnerability to Flooding



Are there critical assets located within the flood zone that would potentially impact the ability to function (power, filters, intakes, transmission mains)?

Criteria	Score
No critical assets impacted	0.25
Up to 25% of facility impacted	0.50
Up to 50% of facility impacted	0.75
More than 50% of facility impacted	1.00
Don't know	1.00



# EPA Estimates of Likelihood



## Part 1: J-100 Method

EPA Threat Categories	Default Threat Likelihood	Frequency (once every ___ years)
Assault on Utility – Physical	0.000001	1,000,000
Contamination of Finished Water - Accidental*	0.2	5
Contamination of Finished Water – Intentional	0.00001	100,000
Theft or Diversion – Physical	0.2	5
Cyber Attack on:		
- Business Enterprise Systems	0.3	3.3
- Process Control Systems	0.1	10
Sabotage – Physical	0.05	20
Contamination of Source Water - Accidental*	0.05	20
Contamination of Source Water - Intentional	0.000001	1,000,000



# 6. Risk and Resilience Analysis



**1 ASSET CHARACTERIZATION –**  
What are the critical assets?

Operational Performance Goals  
**Supply, Pressure, Quality ...**  
Minimum Acceptable Levels

Assets required to fulfill our mission

**2 THREAT CHARACTERIZATION –**  
What are the credible threats?

Reference Threats (partial)		
Malevolent	Natural	Dependency
Assault	Snow & Ice	Utilities
Contamination	Earthquakes	Suppliers
Theft	Tornadoes	Employees
Cyber Attack	Hurricanes	Transportation
Sabotage	Wildfires	Customers

Threats that can impair critical assets

**QUALITATIVE SCORING**

		THREAT CREDIBILITY		
		HIGH	MOD	LOW
ASSET CRITICALITY	HIGH			
	MOD			
	LOW			

**7 RISK/RESILIENCE MANAGEMENT**  
What R/R is acceptable?  
Identify mitigation options  
Estimate Risk/Resilience Improvement  
Evaluate, Select, and Plan for Implementation

**6**

$RISK = C * V * T$   
 $RESILIENCE = V * T * S * D$

**WORST REASONABLE CONSEQUENCES**

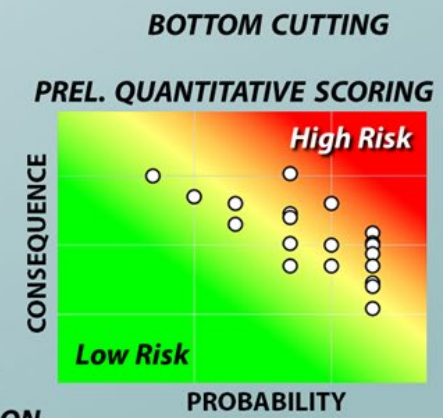
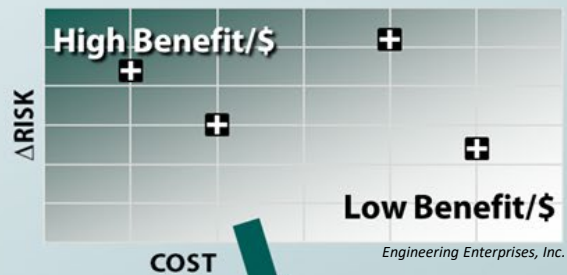
**5 SEVERITY AND DURATION**  
Service Interruption – How Many? How Long?

**4 THREAT LIKELIHOOD (#/Y)**  
How often will the threat occur?

**3 VULNERABILITY ANALYSIS**  
What is our exposure to the threat?

**CONSEQUENCE ANALYSIS (\$)**  
Financial Impacts – Utility/Region

QUANTITATIVE SCORING



**RISK REDUCTION / RESILIENCE ENHANCEMENT PLAN**

**PRIORITIZATION**



# Risk and Resilience Analysis



CONSEQUENCE, C (\$ 000)						VULNERABILITY, V (0 to 1)	REOCCURRENCE (Years)	THREAT LIKELIHOOD, T (0 to 1, per Year)	FACTORED PROBABILITY = $V \cdot T$	SEVERITY, S (% Affected)	DURATION, D (Days)	IMPACT = $D \cdot S$	RISK (\$/Y) = $C \cdot V \cdot T$	RESILIENCE = $V \cdot T \cdot S \cdot D$
Direct	Indirect	Regional	Death	Injury	TOTAL									
\$10,700	\$2,000	\$7,000	\$0	\$0	<b>\$19,700</b>	0.36	20	0.05	0.018	50%	7	3.5	\$355	0.06

	CONSEQUENCE, C (\$ 000)						VULNERABILITY, V (0 to 1)	REOCCURRENCE (Years)	THREAT LIKELIHOOD, T (0 to 1, per Year)	FACTORED PROBABILITY = $V \cdot T$	SEVERITY, S (% Affected)	DURATION, D (Days)	IMPACT = $D \cdot S$	RISK (\$/Y) = $C \cdot V \cdot T$	RESILIENCE = $V \cdot T \cdot S \cdot D$
	Direct	Indirect	Regional	Death	Injury	TOTAL									
TS1															
TS2															
TS3															
TS4															
TS5															
TS6															
TS7															
TS8															
TS9															
TS10															
TS11															
TS12															

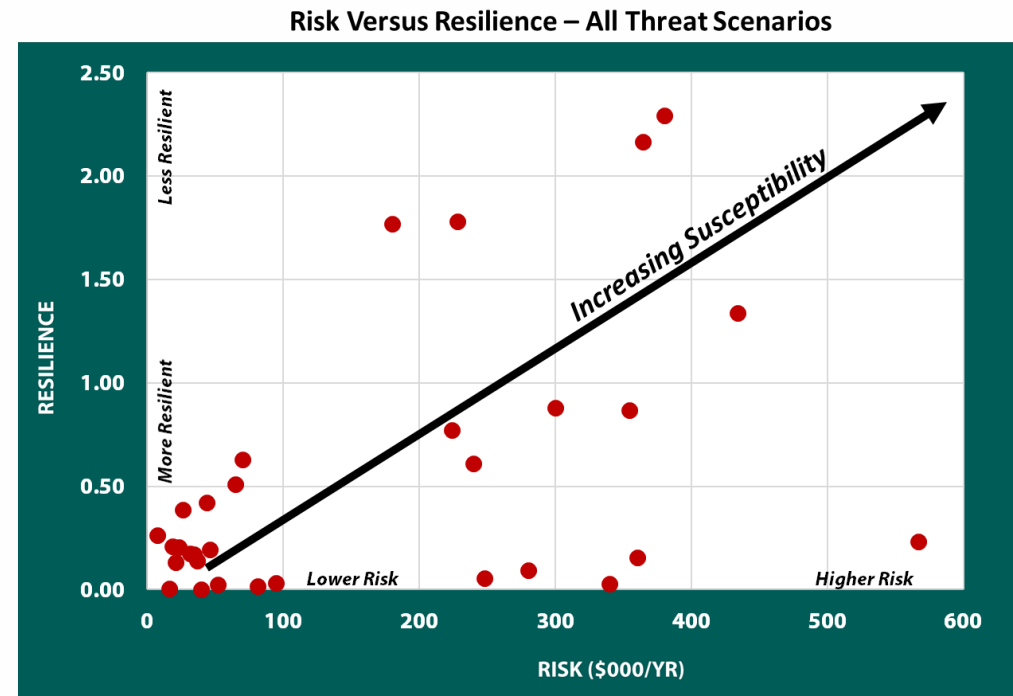




# Common Threat Scenarios



- Source/Supply/Treatment - Accidental Contamination
- Supply/Treatment - Power Outages
- Cyber Attacks – Enterprise / Process Control Systems
- Loss of Key Employees
- Facilities - Sabotage
- Supply/Distribution - Mechanical Failures
- Loss of Key Suppliers







# J-100 Summary Table



J-100 Step	Water Utility A	Water Utility B	Water Utility C
1) Critical Assets	18	17	9
2) Credible Threats	21	20	23
2.5) Threat / Asset Pairs	378 → 26	340 → 20	252 → 6
Preliminary Qualitative Analysis	11	13	6
3) - 6) Risk and Resilience	7	4	6
7) Management Analysis - Mitigation Options			



# 7. Risk and Resilience Management Plan



## 1 ASSET CHARACTERIZATION – What are the critical assets?



Operational Performance Goals  
**Supply, Pressure, Quality ...**  
Minimum Acceptable Levels

Assets required to fulfill our mission

## 2 THREAT CHARACTERIZATION – What are the credible threats?

### Reference Threats (partial)

Malevolent	Natural	Dependency
Assault	Snow & Ice	Utilities
Contamination	Earthquakes	Suppliers
Theft	Tornadoes	Employees
Cyber Attack	Hurricanes	Transportation
Sabotage	Wildfires	Customers

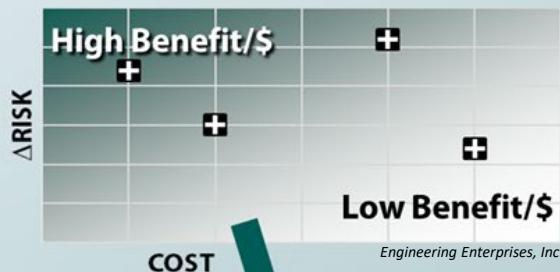
Threats that can impair critical assets

## QUALITATIVE SCORING

		THREAT CREDIBILITY		
		HIGH	MOD	LOW
ASSET CRITICALITY	HIGH			
	MOD			
	LOW			

Engineering Enterprises, Inc.

## 7 RISK/RESILIENCE MANAGEMENT What R/R is acceptable? Identify mitigation options Estimate Risk/Resilience Improvement Evaluate, Select, and Plan for Implementation



$$RISK = C * V * T$$

$$RESILIENCE = V * T * S * D$$

## 6

### SEVERITY AND DURATION

Service Interruption –  
How Many? How Long?

### THREAT LIKELIHOOD (#/Y)

How often will the threat occur?

### VULNERABILITY ANALYSIS

What is our exposure to the threat?

### CONSEQUENCE ANALYSIS (\$)

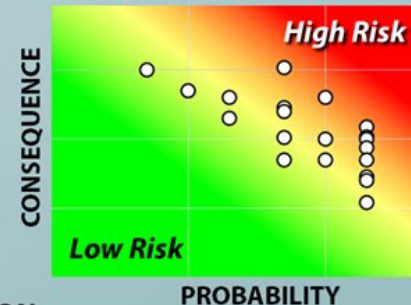
Financial Impacts – Utility/Region

WORST REASONABLE  
CONSEQUENCES



BOTTOM CUTTING

## PREL. QUANTITATIVE SCORING



**RISK REDUCTION / RESILIENCE ENHANCEMENT PLAN**

PRIORITIZATION

Engineering Enterprises, Inc.



# RRA Management Process



Deciding upon and implementing the options to achieve an acceptable level of risk and resilience at an acceptable cost to the utility.

## 1. Decide

What Risk and Resilience Levels Are Acceptable

## 2. Define

Countermeasures and Mitigation/Resilience Options

## 3. Evaluate

Each Countermeasure & Mitigation/Resilience Option

## 4. Accumulate

The Benefits of Each Option

## 5. Estimate

Net Benefits and Benefit-Cost Ratios for Each Option

## 6. Select

Among the Options and Allocation of Resources



# J-100 Summary Table



J-100 Step	Water Utility A	Water Utility B	Water Utility C
1) Critical Assets	18	17	9
2) Credible Threats	21	20	23
2.5) Threat / Asset Pairs	378 → 26	340 → 20	252 → 6
Preliminary Qualitative Analysis	11	13	6
3) - 6) Risk and Resilience	7	4	6
7) Management Analysis - Mitigation Options	7 x 5 = 35	4 x 5 = 20	6 x 4 = 24



# Mitigation Options



## Response and Recovery

- Emergency Response Plan
- Staff training
- Strategic spares
- Rapid deployment plans
- Mutual aid
- Contractor/supplier agreements
- Drought monitoring
- Early warning Systems

## Reliability

- SOPs
- Asset condition assessment
- Improve maintenance
- Track maintenance
- Enhance communications
- Learn from past Incidents
- Source Water Protection

## Resistance

- Relocate combustibles
- Improve ventilation
- Flood controls/protection
- Physical security
- Cyber security
- Access Codes
- Alarms
- Cameras
- Building codes

## Redundancy

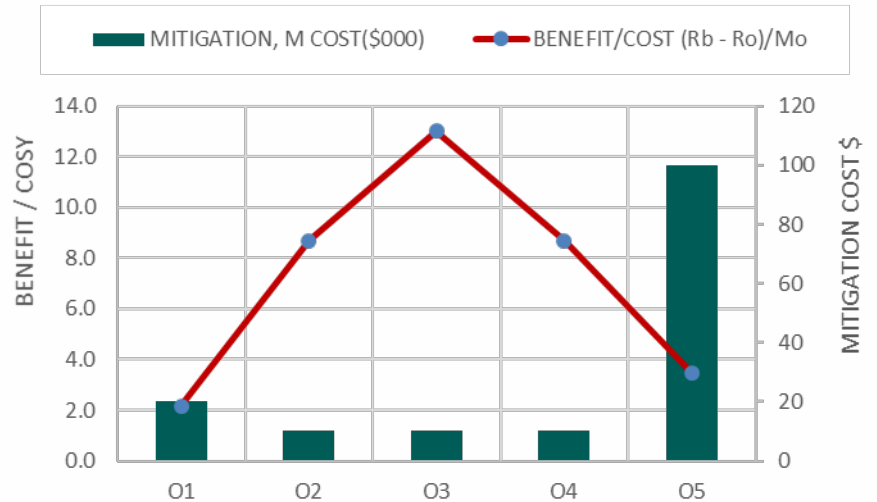
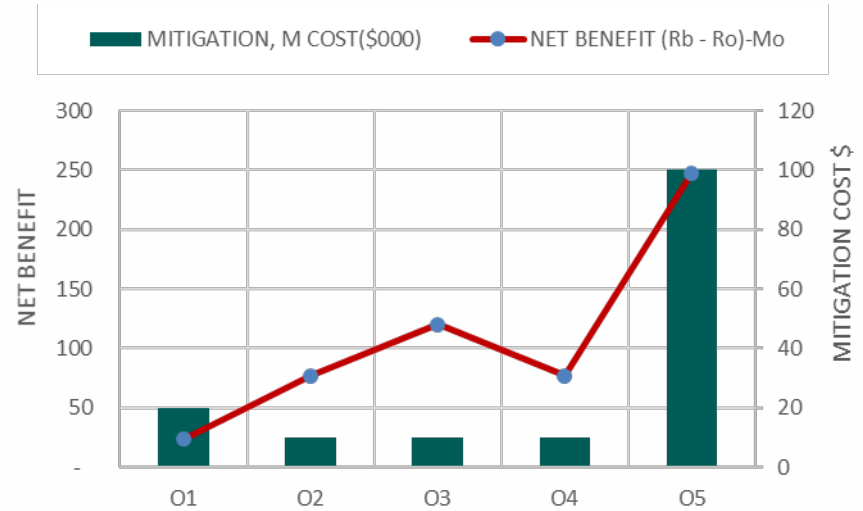
- Improve network interconnectivity
- Interconnections w/ other water systems
- Install bypasses (modular)
- Looped water mains
- Add sources
- Back-up generator



# Mitigation Option Analysis



	RISK (\$/Y) = C*V*T	RESILIENCE = V*T*\$*D	MITIGATION, M COST(\$000)	Δ RISK (\$/Y)	Δ RESILIENCE	NET BENEFIT (Rb - Ro)-Mo	BENEFIT/COST (Rb - Ro)/Mo
<b>B</b>	<b>2,275</b>	<b>0.980</b>					
O1	2,048	0.882	60	228	0.098	168	3.8
O2	1,820	0.784	10	455	0.196	445	45.5
O3	1,593	0.686	10	683	0.294	673	68.3
O4	1,820	0.784	10	455	0.196	445	45.5
O5	228	0.098	100	2048	0.882	1,948	20.5





# Prioritizing Mitigation Options



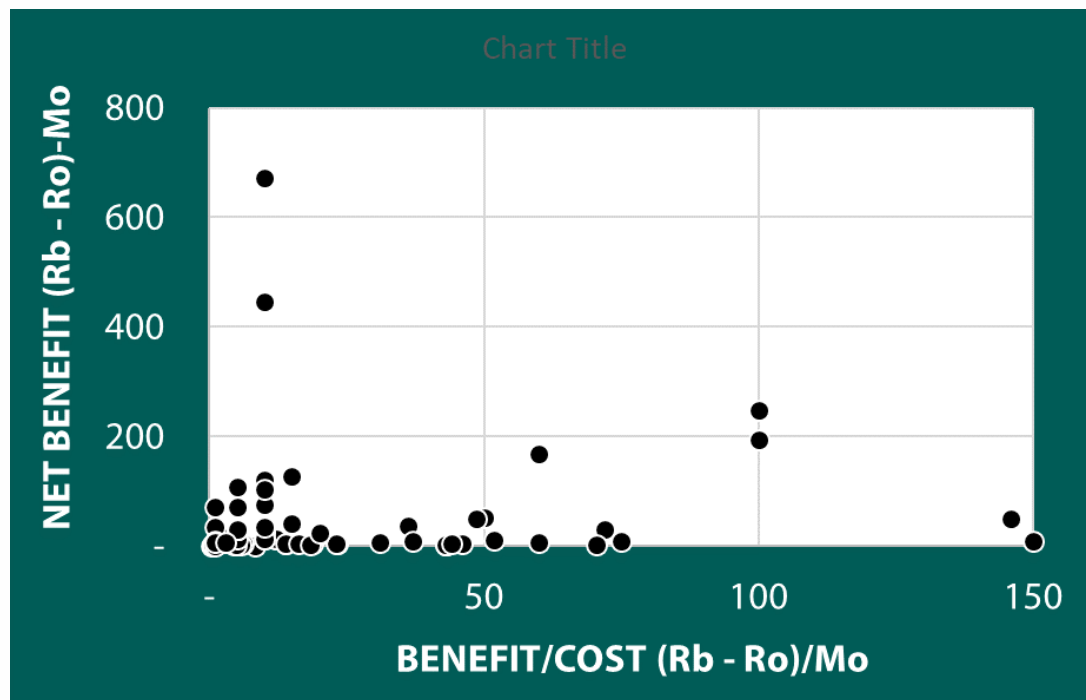
Mitigation Cost

Net Benefits

Benefit / Cost

Timing

Preferences





# Questions / Comments



**Thanks for Attending!**