CITY OF WHEATON Illinois

ENGINEERING DEPARTMENT
303 W WESLEY STREET, WHEATON, IL, 60187
630.260.2065 | www.wheaton.il.us

MEMORANDUM

TO: The Honorable Mayor and City Council

FROM: Joseph E. Tebrugge, Director of Engineering

DATE: December 8, 2020

SUBJECT: **City of Wheaton Flood Resiliency Investigation - Flood Protection Program Discussion Part 3**

Staff will be presenting the 3rd informational session on the general topic of storm water management with the goal of decreasing overland flooding of primary structures. This presentation is a follow-up to the March 9, 2020 and August 31, 2020 Planning Sessions where Flood Resiliency Investigation, Parts 1 and 2 were presented.

PART 1 – Why Wheaton Floods and Where is the Flooding – March 9th, 2020

Provided an overview and history of "why do areas flood." Several key facts were presented including:

- 1977 City first adopts storm water ordinance setting forth specific requirements for detention; a large portion of the City was built prior to 1977.
- Overland flooding is defined as storm water entering structure over a low entry point or over the top of foundation. This is distinctly different than flooding up through a floor drain or up through a basement floor which is not a part of our investigation.
- 100-year rain fall (1% chance of occurring) continued to increase from 5.8 inches over 24 hours (1977) to now 8.59 inches over 24 hours.
- Identified 3 areas of overland flooding – flood plain, flood prone, and site specific areas.
- Confirmed 69 (35 of which are over top of foundation) structures in the flood plan, 246 (129 of which are over top of foundation) in flood prone and 145 in site specific have confirmed overland flooding.

PART 2 – What Projects Can be Done to Increase Flood Resiliency – August 31st, 2020

Focused on three plans of action for addressing overland flooding – buy outs, flood proofing, and/or new public infrastructure projects with *very preliminary* estimated costs identified. Key facts identified:

- Three distinct areas of overland flooding of structures were identified – floodplain, flood prone and site specific – with each area investigated individually. Projects found to be possible are as such:
  - **Floodplain** : Buyouts and Floodproofing

- **Flood Prone** : Buyouts, Floodproofing*, and Capital Improvement Projects
  *Floodproofing included minor projects such as window wells and major projects such as elevating structures to higher foundations
- **Site Specific** : Floodproofing (minor projects), and Small Scale Regrading Projects**
  **Small scale Regrading Projects replaced formal Capital Improvement Projects as a major project is rarely needed in site specific areas

- The benefit cost analysis formulas used by FEMA results in good BCAs for that flood repetitively (such as in the 5 and 10 year storms) and generally gradually get less beneficial as you move to less frequent storms (such as the 50 and 100 year storms)
- Floodproofing of structures that receive overland flooding over the top of the foundation is much more difficult since it requires the home to be lifted off of its foundation and reconstructed with a higher foundation.
- Funding of the plans of action was not addressed but will be a critical component of any solution.

It was also emphasized that the overland flooding plans of action will not entirely address flooding in the City. Flooding will still occur - localized street flooding, localized flooding of low depressional areas, basement seepage, sump pump failure, and sanitary backups and overflows. The plans only address structures that receive overland flooding.

The total cost for Floodproofing projects (Preliminary cost approx. $21.5 Million) was substantially less than both Buyout options (Preliminary cost approx. $107.5 Million) and Capital Improvement Project options (Preliminary cost approx. $42.3 Million). However, this included the Floodproofing of homes that receive water over the top of the foundation which necessitates the elevation of the homes to a new, higher foundation. As the elevation (raising) of a structure is a complex and intrusive project it was recommended to present to Council more specific information about this project type. It was also desired to have a more specific presentation to Council about possible Grant Funding Avenues to draw clarity towards the possible reduction of total project cost.

*See attached Memo on answers to Council Part 2 questions.

PART 3 – Flood Proofing Structures and Grants

The December 14 Planning Session will be focusing on what it means to flood protect a structure from overland flooding via elevating the structure from an architectural and structural perspective, and identification of available grants and realistic expectations for obtaining grant funding for solutions (buy outs, flood proofing, and/or new public infrastructure projects) to decrease overland flooding.

The first presentation to Council has been prepared by Shauna Urlacher, PE, CFM from UrbanHydro Engineering, Inc. who is one of the foremost experts on Stormwater Grants in our area. Her presentation will depict the type of grants that are available for the remediation of Overland Flooding in the City of Wheaton, the areas that the available grants can be applied to (Floodplain etc.), and the type of projects that the grants are used for.

The second presentation to Council has been prepared by architect Tom Tristano and structural engineer Jeff Gutowsky of Prairie Forge Group and WT Engineering respectively. Mr. Tristano and Mr. Gutowsky have been involved in numerous structure elevation projects including in nearby Lisle. The City of Wheaton currently has a wealth of Civil Engineering data gathered for the Overland Flooding

Structures. However, to move forward with a Floodproofing Program that would include the elevation of homes to higher foundations, an entirely different analysis is required which includes an architectural and structural engineering investigation. Their presentation focuses on the steps to create a structure elevation project scope as well as the actual elevation of structures themselves.

Where To Go From Here

There are several variables in dealing with the overland flooding problem. We have three distinctly different areas when considering the floodplain, flood prone, and site specific. Each of these three areas have distinctly different solutions. Further, each of the 17 Flood Prone Areas are distinctly different from each other and have different solutions available to each. Also, there is a large difference between homes that obtain overland flooding over the top of the foundation and those that do not. Other variables that should be considered are Storm Frequency, Benefit Cost Analysis, Grant Funding, and Total Cost of Program.

A program that can deal with the variability of overland flooding across the City, and the number of overland flooding solutions, the staff is recommending the development of a single Decision/Solution Framework. This Decision/Solution Framework will be able to be applied repetitively across all the overland flooding properties in all areas. However, depending on the area, the decision component of the framework may lead to different solutions based on the specific challenges the area presents. This decision component of the framework would include storm frequency, benefit cost analysis and ability to obtain grant funding. We proposed to bring something back for your review by mid February 2021.

To assist in development of the decision component of the framework, it would be helpful to discuss the following questions.

Questions to discuss tonight:

1) Should the framework consider the elevation of structures as part of floodproofing?
2) Should the framework anticipate structure protection for a storm frequency to the 100-year storm, or some frequency less than that?
3) Should the framework only address Cost Effective Projects (BCA over 1)?
4) Is there any information that would be helpful to the Council when we present the framework that has been missing in presentations to this point?

Attachments:

A – Response to Council Part 2 Questions
B – Grant Presentation Slides
C – Structure Elevation Presentation Slides

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MEMORANDUM

TO: The Honorable Mayor and City Council

FROM: Joseph E. Tebrugge, Director of Engineering

DATE: October 20, 2020

SUBJECT: **Floodplain and Flood Prone Properties that flood Over the Top of Foundation**

In the last Stormwater Presentation to Council, City of Wheaton Flood Resiliency Investigation : Flood Protection Program Discussion Part 2, an important distinction was made between homes that flood overland and homes that flood overland over the top of the foundation. The important distinction between the two is that homes that **do not** flood over the top of the foundation have generally less invasive and less expensive solutions to stop the overland flooding. During that presentation it was asked how many of the 69 structures in the Floodplain and how many of the 246 structures in the Flood Prone Areas receive overland flooding over the top of the foundation. In order to provide consistent information as was provided in the presentation structures have been included up to the 100-year storm level.

For the Floodplain: 35 of the 69 Structures

For the Flood Prone Areas: 129 of the 246 Structures

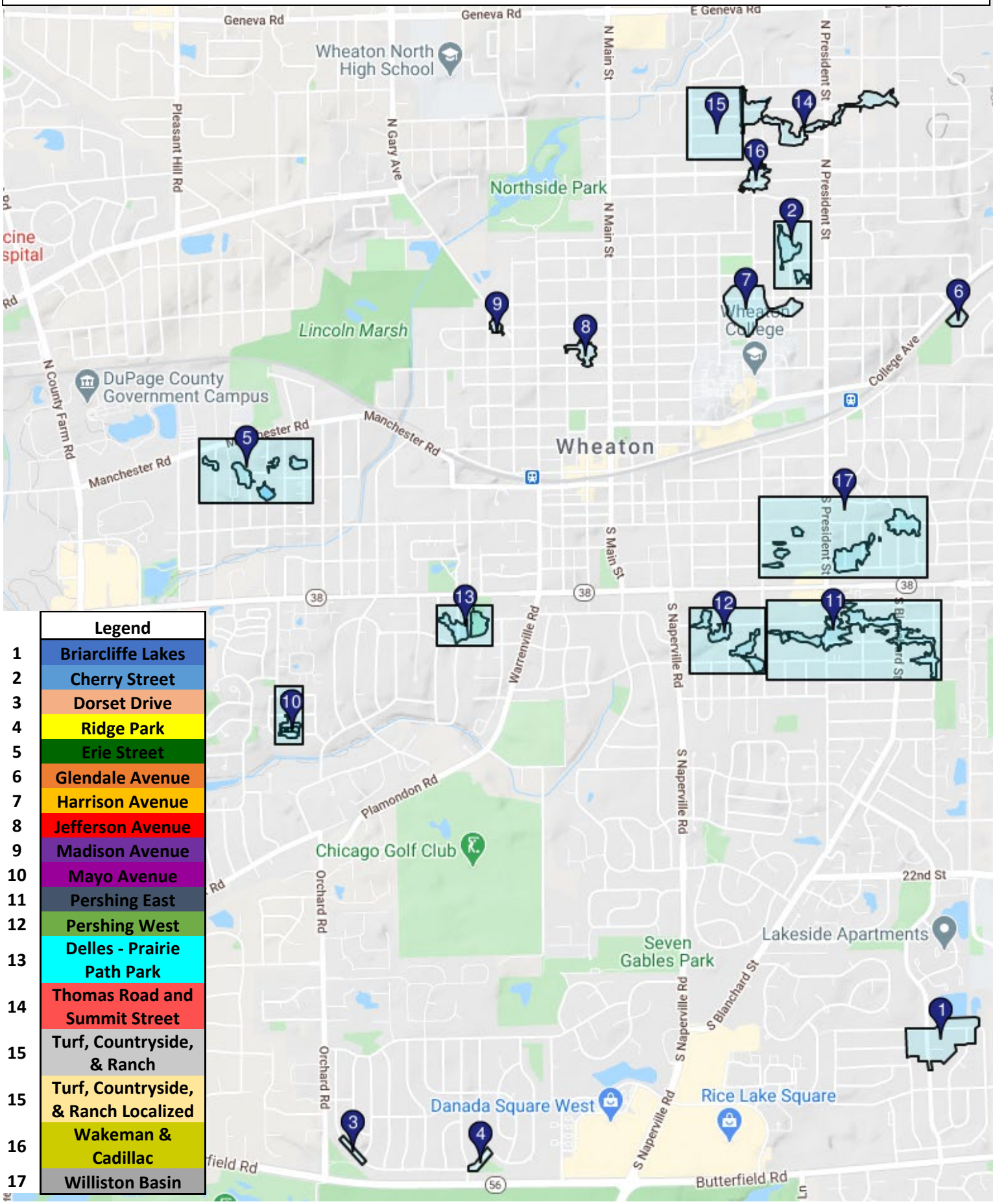
It was also desired to have the list of defined overland structures be provided to Council for additional consideration. Lists of the affected structures have been generated using the currently available dataset. The address of the structures and the frequency where overland flooding currently occurs is attached.

FLOODPLAIN HOMES RECEIVING OVERLAND FLOODING

COW Address	TEST FOR OVERLAND	TEST FOR OVER T/F	Yr Stm Overland flooding Starts	Yr Stm Overland over T/F
1412 N MORSE ST	OVERLAND	OVER T/F	10	10
1811 N MAIN ST	OVERLAND	OVER T/F	10	10
104 W PARK AVE	OVERLAND	OVER T/F	25	25
816 S MAIN ST	OVERLAND	OVER T/F	10	25
420 S MAIN ST	OVERLAND	OVER T/F	25	25
111 W INDIANA ST	OVERLAND	OVER T/F	25	25
424 S PIERCE AVE	OVERLAND	OVER T/F	25	25
224 KELLOGG PL	OVERLAND	OVER T/F	50	50
114 W INDIANA ST	OVERLAND	OVER T/F	50	50
1345 AURORA WAY	OVERLAND	OVER T/F	25	50
828 S MAIN ST	OVERLAND	OVER T/F	50	50
1005 S MAIN ST	OVERLAND	OVER T/F	50	50
107 W INDIANA ST	OVERLAND	OVER T/F	50	50
103 E PARK AVE	OVERLAND	OVER T/F	50	50
119 W PARK AVE	OVERLAND	OVER T/F	25	50
129 W PARK AVE	OVERLAND	OVER T/F	25	50
1403 S GABLES BLVD	OVERLAND	OVER T/F	25	50
1265 FOOTHILL DR	OVERLAND	OVER T/F	50	50
1485 CREEKSIDE DR	OVERLAND	OVER T/F	50	50
418 S PIERCE AVE	OVERLAND	OVER T/F	10	50
1141 AURORA WAY	OVERLAND	OVER T/F	50	50
423 S PIERCE AVE	OVERLAND	OVER T/F	50	50
214 S WASHINGTON ST	OVERLAND	OVER T/F	10	50
414 S DORCHESTER AVE	OVERLAND	OVER T/F	10	50
225 KELLOGG PL	OVERLAND	OVER T/F	100	100
224 N WILLISTON ST	OVERLAND	OVER T/F	100	100
918 S MAIN ST	OVERLAND	OVER T/F	50	100
912 S MAIN ST	OVERLAND	OVER T/F	100	100
414 S PIERCE AVE	OVERLAND	OVER T/F	10	100
1225 FOOTHILL DR	OVERLAND	OVER T/F	50	100
1415 N MORSE ST	OVERLAND	OVER T/F	50	100
404-406 S MAIN ST	OVERLAND	OVER T/F	100	100
1433 N MORSE ST	OVERLAND	OVER T/F	50	100
133 W PARK AVE	OVERLAND	OVER T/F	100	100
519 W PRAIRIE AVE	OVERLAND	OVER T/F	25	100
1480 AURORA WAY	OVERLAND		100	500
2126 CREEKSIDE DR	OVERLAND		100	500
410 S DORCHESTER AVE	OVERLAND		50	500
104 E ELM ST	OVERLAND		50	500
117 E ELM ST	OVERLAND		100	500
1769 GONE AWAY LN	OVERLAND		100	500
423 S HALE ST	OVERLAND		50	500
419 S HALE ST	OVERLAND		50	500
425 S HALE ST	OVERLAND		50	500
1411 HILL AVE	OVERLAND		100	500
412-414 S MAIN ST	OVERLAND		50	500
921 S MAIN ST	OVERLAND		100	500
1420 S MAIN ST	OVERLAND		100	500
906 S MAIN ST	OVERLAND		100	500
902 S MAIN ST	OVERLAND		50	500
1483 N MORSE ST	OVERLAND		10	500
1451 N MORSE ST	OVERLAND		10	500
1428 N MORSE ST	OVERLAND		25	500
1505 N MORSE ST	OVERLAND		50	500
2003 PADDOCK CT	OVERLAND		100	500
419 S PIERCE AVE	OVERLAND		50	500
410 S PIERCE AVE	OVERLAND		50	500
511 W PRAIRIE AVE	OVERLAND		50	500
520 W PRAIRIE AVE	OVERLAND		25	500
223 N WILLISTON ST	OVERLAND		100	500
1225 AURORA WAY	OVERLAND		100	0
1486 BRIAR CV	OVERLAND		100	0
1797 GONE AWAY LN	OVERLAND		50	0
1002 S MAIN ST	OVERLAND		100	0
1482 PEBBLESTONE CV	OVERLAND		100	0
1489 PEBBLESTONE CV	OVERLAND		100	0
1481 STONEBRIDGE TRL	OVERLAND		25	0
510 W PRAIRIE AVENUE	OVERLAND		100	0
415 MORGAN	OVERLAND		100	0

*NOTE: MORSE STREET PROPERTIES ARE PROTECTED BY THE THOMPSON BERM TO THE 100 YEAR STORM

CITY OF WHEATON FLOOD PRONE AREA MAP



	Legend
1	Briarcliffe Lakes
2	Cherry Street
3	Dorset Drive
4	Ridge Park
5	Erie Street
6	Glendale Avenue
7	Harrison Avenue
8	Jefferson Avenue
9	Madison Avenue
10	Mayo Avenue
11	Pershing East
12	Pershing West
13	Delles - Prairie Path Park
14	Thomas Road and Summit Street
15	Turf, Countryside, & Ranch
15	Turf, Countryside, & Ranch Localized
16	Wakeman & Cadillac
17	Williston Basin

FLOOD PRONE AREA HOMES RECEIVING FLOODING OVER THE TOP OF FOUNDATION

Address #	Dir.	Street	Study/Frequency	Address #	Dir.	Street	Study/Frequency
200		Erie St	2	509		Countryside Dr	10
518		Kipling Ct	5	604		Driving Park Rd	10
522		Kipling Ct	5	128	W	Jefferson Ave	10
528		Kipling Ct	5	210	W	Jefferson Ave	10
1015		Evergreen St	5	127	W	Lincoln Ave	10
1402		Illinois St	5	201	W	Lincoln Ave	10
806		Cherry St	5	205	W	Lincoln Ave	10
817		Cherry St	5	118		Morgan Ave	10
820	E	Harrison Ave	5	1714		President St	10
811		Howard St	5	907		Ranch Rd	10
1104		Cherry St	5	1711		Webster Ct	10
1106		Cherry St	5	1872		Briarcliffe Blvd	25
1110		Cherry St	5	1884		Briarcliffe Blvd	25
1114		Cherry St	5	1898		Briarcliffe Blvd	25
512		Pershing Ave	5	1904		Briarcliffe Blvd	25
624	E	Elm St	5	1910		Briarcliffe Blvd	25
1218		Pershing Ave	5	1879		Nottingham Ln	25
920	S	President St	5	1885		Nottingham Ln	25
824	S	Williston St	5	1891		Nottingham Ln	25
1407		Wilson Ave	5	1895		Doncaster Ct	25
1891		Doncaster Ct	10	1899		Doncaster Ct	25
1885		Cheshire Ln	10	1887		Briarcliffe Blvd	25
1880		Cheshire Ln	10	1913		Briarcliffe Blvd	25
1888		Cheshire Ln	10	1619		Brentwood Ln	25
1684		Brentwood Ln	10	1636		Brentwood Ln	25
1706		Brentwood Ln	10	1687		Brentwood Ln	25
1709		Brentwood Ln	10	1733		Brentwood Ln	25
1730		Brentwood Ln	10	1845		Brentwood Ln	25
1755		Brentwood Ln	10	1590		Brentwood Ln	25
1770		Brentwood Ln	10	562		Glendale Ave	25
1775		Brentwood Ln	10	558		Glendale Ave	25
1795		Brentwood Ln	10	804	E	Indiana St	25
519		Kipling Ct	10	518		Williston St	25
514		Kipling Ct	10	507		Williston St	25
506		Williston St	10	515		Williston St	25
810		Cherry St	10	407		Blanchard St	25
811		Cherry St	10	802		Cherry St	25
816		Cherry St	10	817		Howard St	25
807		Howard St	10	1032		Cherry St	25
1103		Cherry St	10	1117		Howard St	25
1107		Cherry St	10	119		Pierce Ave	25

FLOOD PRONE AREA HOMES RECEIVING FLOODING OVER THE TOP OF FOUNDATION

Address #	Dir.	Street	Study/Frequency
123		Pierce Ave	25
114		Morgan Ave	25
1876		Briarcliffe Blvd	50
1892		Briarcliffe Blvd	50
1897		Nottingham Ln	50
1902		Doncaster Ct	50
1908		Doncaster Ct	50
1660		Brentwood Ln	50
522		Williston St	50
726		Howard St	50
700		North Path	50
1033		Cherry St	50
1118		Cherry St	50
904		Blanchard St	50
1011		Pershing Ave	50
1222		Pershing Ave	50
921	S	President St	50
1007		Wilson Ave	50
527		Countryside Dr	50
533		Countryside Dr	50
409		Turf Ln	50
415		Turf Ln	50
809		Greenwood	50
818		Delles Rd	50
616		Park Ave	50
115		Pierce Ave	50
1711		Cherry Ct	50
540		Hawthorne Blvd	50
602		Parkway Dr	50
603		Wakeman Ave	50
604		Wakeman Ave	50
1903		Nottingham Ln	100
1663		Brentwood Ln	100
825		Cherry St	100
721		North Path	100
1028		Cherry St	100
1308		Pershing Ave	100
819		Delles Rd	100
823		Delles Rd	100
827		Delles Rd	100
1502		Mayo Ave	100
1516		Paula Ave	100
725		Ranch Rd	100
809		Ranch Rd	100
567		Parkway Dr	100
607		Wakeman Ave	100
608		Wakeman Ave	100
1705		Driving Park Rd	100
Total =		**129**	**Homes**

	Legend
1	Briarcliffe Lakes
2	Cherry Street
3	Dorset Drive
4	Ridge Park
5	Erie Street
6	Glendale Avenue
7	Harrison Avenue
8	Jefferson Avenue
9	Madison Avenue
10	Mayo Avenue
11	Pershing East
12	Pershing West
13	Delles - Prairie Path Park
14	Thomas Road and Summit Street
15	Turf, Countryside, & Ranch
15	Turf, Countryside, & Ranch Localized
16	Wakeman & Cadillac
17	Williston Basin

FLOOD PRONE AREA HOMES WITH OVERLAND FLOODING *NOT* OVER THE TOP OF FOUNDATION

Address #	Dir.	Street	Study/Frequency	Address #	Dir.	Street	Study/Frequency
511	S	President St	5	1510		Paula Ave	25
529		Kipling Ct	5	1518		Paula Ave	25
1109		Evergreen St	5	1515		Paula Ave	25
821		Cherry St	5	1906		Doncaster Ct	50
812		Webster Ave	5	1911		Briarcliffe Blvd	50
816		Webster Ave	5	2048		Dorset	50
922		Webster Ave	5	2057		Dorset	50
930		Webster Ave	5	710		Evergreen St	50
1111		Pershing Ave	5	511		Kipling Ct	50
1115		Pershing Ave	5	510		Kipling Ct	50
1119		Pershing Ave	5	503		Williston St	50
914	S	President St	5	511		Williston St	50
515	S	President St	10	519		Williston St	50
711		Cherry St	10	406		Blanchard St	50
820		Cherry St	10	402		Summit St	50
1516		Elm St	10	535	E	Harrison Ave	50
1215		Pershing Ave	10	901		Santa Rosa Ave	50
420		Ranch	10	903		Webster Ave	50
508		Ranch	10	1119		Howard St	50
404		Countryside	10	504		Pershing Ave	50
408		Countryside	10	508		Pershing Ave	50
420		Countryside	10	610	E	Elm St	50
504		Countryside	10	423		Pershing Ave	50
508		Countryside	10	1006		Pershing Ave	50
432		Turf	10	1010		Pershing Ave	50
504		Turf	10	815	S	President St	50
122		Morgan Ave	10	1106		Taft Ave	50
110		Morgan Ave	10	1512		Wilson Ave	50
1879		Briarcliffe Blvd	25	1410		Wilson Ave	50
566		Glendale Ave	25	527		Turf Ln	50
2047		Dorset	25	533		Turf Ln	50
2053		Dorset	25	420		Turf	50
507	S	President St	25	206	W	Jefferson Ave	50
523		Kipling Ct	25	201		Erie St	50
528		Williston St	25	1845		Hickory Ln	50
402		Blanchard St	25	131		White Oak Dr	50
1403		Illinois St	25	1523		Paula Ave	50
1304		Pershing Ave	25	612		Countryside Dr	50
926	S	President St	25	538		Hawthorne Blvd	50
1006		Wilson Ave	25	1865		Nottingham Ln	100
428		Ranch	25	2039		Dorset	100
1514		Mayo Ave	25	539		Wakeman Ave	100

FLOOD PRONE AREA HOMES WITH OVERLAND FLOODING *NOT* OVER THE TOP OF FOUNDATION

423		Williston St	100
408		Summit St	100
412		Summit St	100
416		Summit St	100
322		Blanchard St	100
904		Santa Rosa Ave	100
915		Cherry St	100
1003		Cherry St	100
1007		Cherry St	100
1122		Cherry St	100
717	E	Forest Ave	100
1135		Howard St	100
1504		Elm St	100
1014		Pershing Ave	100
1019		Pershing Ave	100
903	S	President St	100
1018		Wilson Ave	100
1504		Wilson Ave	100
1513		Wilson Ave	100
532		Turf Ln	100
521		Countryside Dr	100
528		Countryside Dr	100
532		Countryside Dr	100
1729		Driving Park Rd	100
1723		Driving Park Rd	100
432		Ranch	100
1770		Hickory Ln	100
123		White Oak Dr	100
1515		Mayo Ave	100
1524		Paula Ave	100
1511		Paula Ave	100
1507		Paula Ave	100
1715		Cherry Ct	100

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12	Pershing West
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15	Turf, Countryside, & Ranch
15	Turf, Countryside, & Ranch Localized
16	Wakeman & Cadillac
17	Williston Basin

UrbanHydro

City of Wheaton Stormwater Grant Funding

Prepared by: Shauna Urlacher, PE, CFM
UrbanHydro Engineering, Inc.
Shauna@UrbanHydroEng.com

Date: December 14, 2020

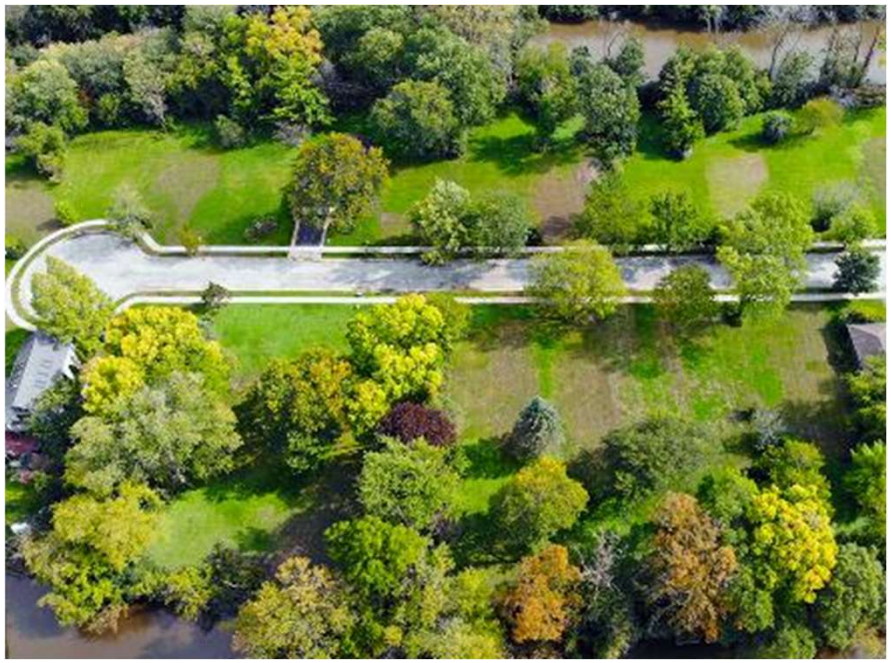
Grant Experience

City of Des Plaines

$20.3 Million in funding (2015 – 2020)

Before

After



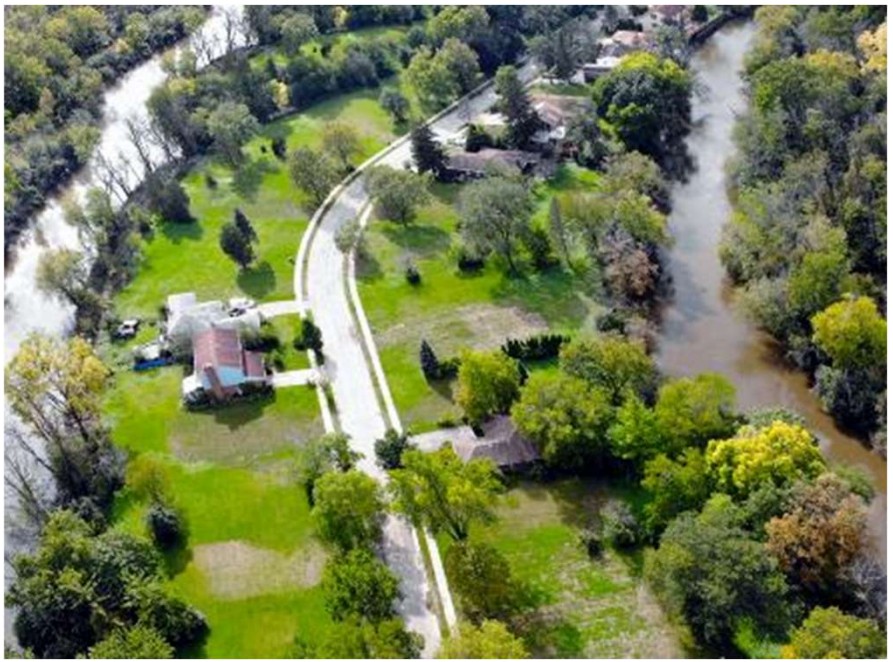
Grant Experience

City of Des Plaines

$20.3 Million in funding (2015 – 2020)

Before

After



Grant Opportunities

FEMA

- HMGP
- FMA
- BRIC

IEPA

- 319
- GIGO

IDNR

Flood Hazard Mitigation Program

FEMA Grants

FEMA Grant Programs - Overview

Annual Programs

HMGP

Post-flood

Only available after Disaster Declaration

FMA

Floodplain

Mitigates flooding of structures <u>with flood insurance</u>

BRIC

Large-scale

For large projects that make community more resilient

FEMA Grant Programs - Overview

Project Types	HMGP	FMA	BRIC
Buyouts	✓	✓	!
Floodproofing	!	!	!
Infrastructure Projects	!	!	✓

FEMA Grant Programs - Details

Same application for all 3 programs

(very detailed and complex application)

Largest Funding Source

BRIC = $50 Mil

FMA = $30 Mil

HMGP = Varies

Slow Process

5 years

2 years until start

3 years to complete

Cost Share

75% Federal

25% Local

FEMA Grant Recommendations

FEMA's Priority

Severe Repetitive Loss

HMGP & FMA

Buyouts

BRIC

Large Infrastructure Projects

Holistic Solutions

Improve Resiliency

(Community Lifelines & Nature-based Solutions)

IEPA Grants

IEPA Grant Programs - Overview

319 Grant

Water Quality (Pollution)

Urban Wetlands

Detention Retrofits

Streambank Stabilization

GIGO

Water Quality (Including Flooding)

Disconnect Downspouts

Bio-swales

Stream Meandering

IEPA Grant Programs - Overview

Project Types	319	GIGO
Buyouts	X	X
Floodproofing	X	
Infrastructure Projects	✓	✓

IEPA Grant Programs - Details

Similar application for both programs

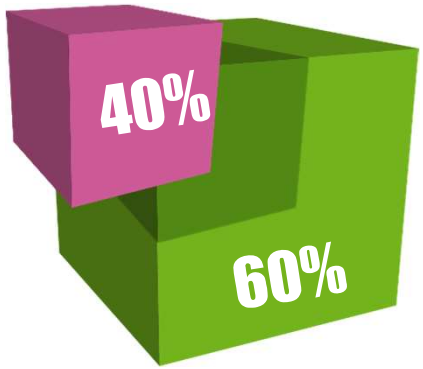
(application requires moderate level of detail)

Max. Funding

Typically less
than $1.0 Million
per application

Faster Process

3 years
1 year to start
2 years to complete



Cost Share

319 = 60/40
GIGO = 75/25

IEPA Grant Recommendations

319 Grant

Best for:

Streambank Stabilization
Watershed Plans
(focused on water quality)

(Annual program)

GIGO

Best for:

Green Infrastructure Projects
Naturalized Detention
Infiltration Practices

(Program has funding for 5 years)

IDNR Mitigation Grant

IDNR Grant Program - Overview

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

Buyouts Only

Only for acquisition and demolition of flooding properties.

IDNR Grant Program - Overview

Project Types	IDNR Mitigation Program
Buyouts	✓
Floodproofing	X
Infrastructure Projects	X

IDNR Grant Programs - Details

Simplified application

Max. Funding
Typically less
than $2.0 Million
per application

Faster Process
3 years
<1 year to start
2 years to complete

Cost Share
100% IDNR

IDNR Grant Recommendations

Best Funding Option for:

Buyouts of Substantially Damaged and Repetitive Loss

NOTES:

Program dependent on Legislative funding

Can NOT be used as Cost Share for FEMA

SUMMARY

SUMMARY

Project Types	HMGP	FMA	BRIC	319	GIGO	IDNR
Buyouts	✓	✓	!	X	X	✓
Floodproofing	!	!	!	X	!	X
Infrastructure Projects	!	!	✓	✓	✓	X

SUMMARY

	Disaster Declaration	Flood Insured		Water Quality		
Project Types	**HMGP**	**FMA**	**BRIC**	**319**	**GIGO**	**IDNR**
Buyouts	✓	✓	!	X	X	✓
Floodproofing	!	!	!	X	!	X
Infrastructure Projects	!	!	✓	✓	✓	X

RECOMMENDATIONS

Buyout Program

Large – FEMA

Small - IDNR

Floodproofing

N/A

Infrastructure Projects

BRIC

Questions?

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UrbanHydro Engineering, Inc.
Shauna@UrbanHydroEng.com

City of Wheaton

Elevating Buildings in Flood Plains

Wheaton, IL

December 14, 2020

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Background

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- **The City has significant site information that rightly addresses the 20Water Sheds throughout the City.**
- The previously completed studies highlight sites located within the "flood plain" and "flood prone" zones with three (3) overall solutions to these flooding conditions.
- One possible solution is to elevate the structures above the Base Flood Elevation - **"BFE."**

Tonight we will **REVIEW** general questions about the lifting of structures:

- What does the **process** of elevating a home located in a "flood plain" entail?
- What is the **major sequence of events** required to elevate a structure?
- What is a possible **timeline** from start to finish?
- What probable **costs** can be expected with elevating structures?

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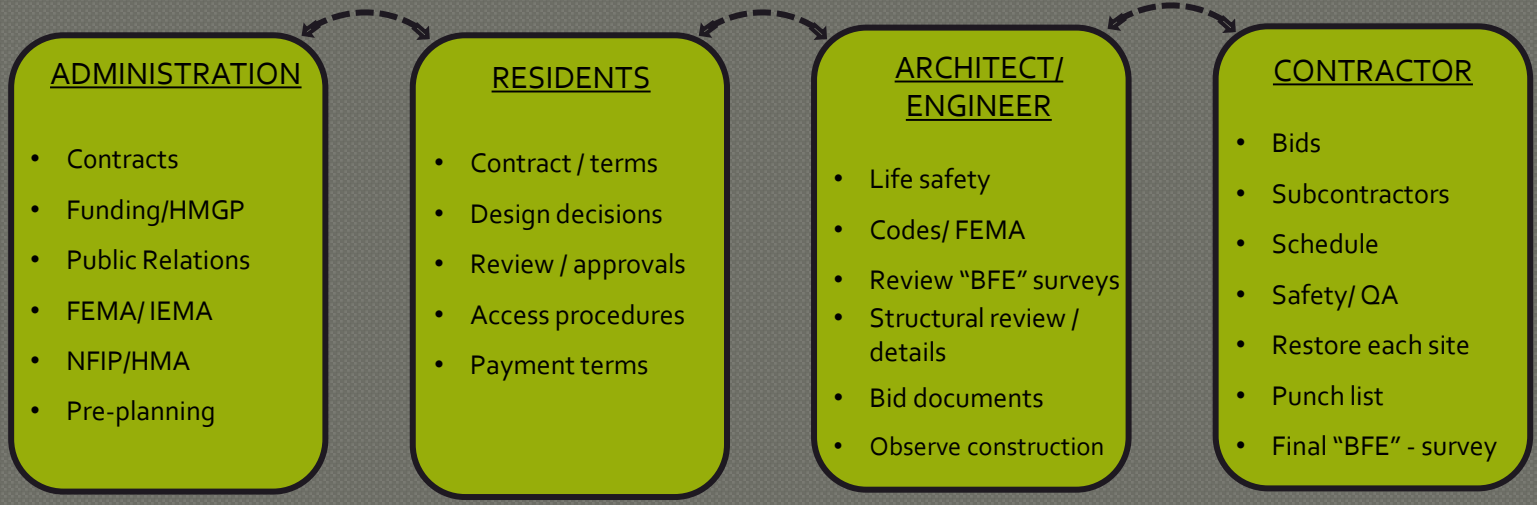
Communication Protocols



- ☐ The type of "Funding Grants" will determine what can be covered!
- ☐ "Flood Plain" sites are controlled by FEMA -"Flood Prone" sites are not!

FEMA

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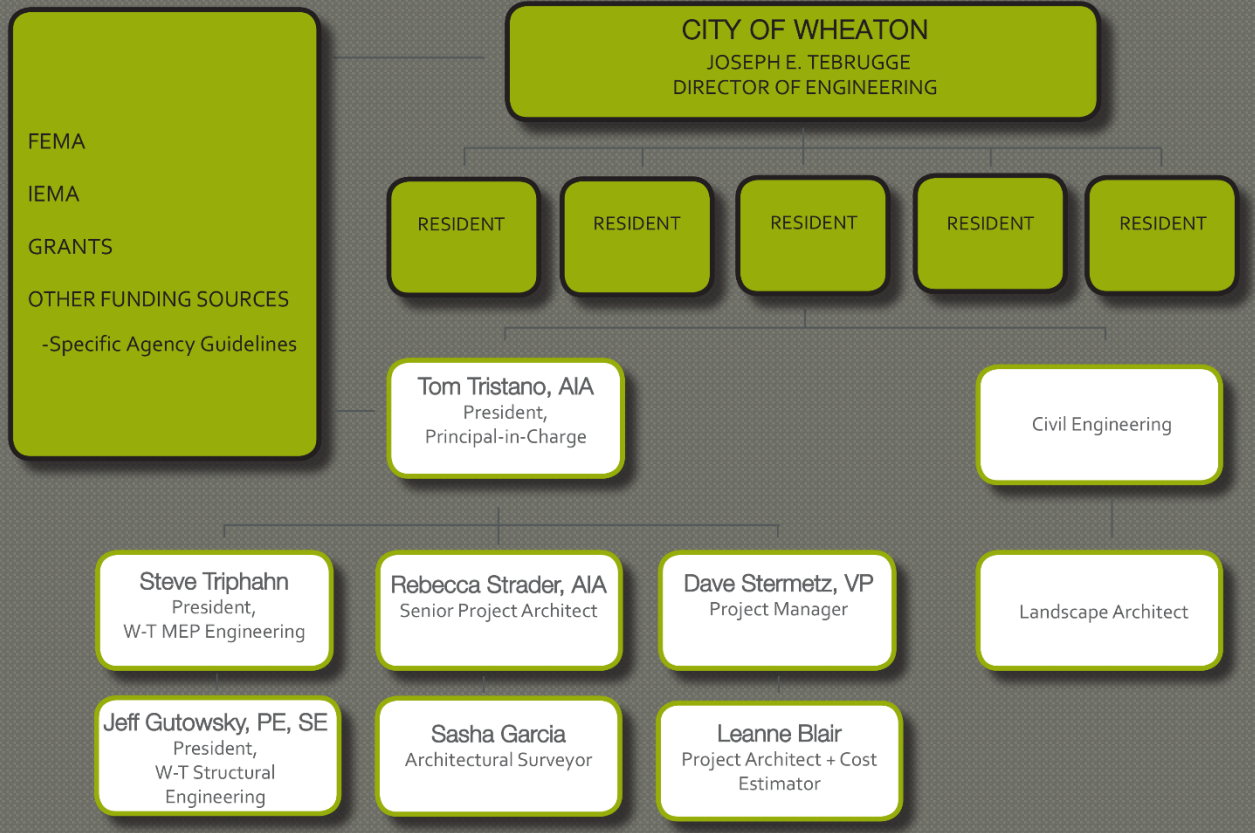
Project Team

W-T Group



U.S. DEPARTMENT OF HOMELAND SECURITY

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Steps in the Process

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1. Conduct a Rapid Assessment at each site.
2. Conduct a Civil / Soils / Base Flood Elevation Assessment at each site.
3. Conduct an Architectural / Structural Assessment at each site.
4. Meet and consult with Stake Holders - residents, the City & governing authorities.
5. Develop Design Options – Review with Stake Holders.
6. Final Engineering Design – Permit and Bid Documents.
7. Issue Documents for Bidding and Construction.
8. Punch List / Project Close-Out / Verify "BFE" – Final Survey

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Types of Structures that can be lifted !

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Slab on Grade

Two Story

Crawl Space

Tri-Level – Finished Lower Level

Hybrid – SOG - Crawl Space - Finished Basement

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Review the Lifting Process

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Step 1 - Rapid Assessment

1. Research available documentation from Home Owners, County, City and other governing authorities. – Base Flood Elevation - "BFE," 1st floor elevation/lowest opening, the existing floor plans, aerial maps, basement, crawl space, slab on grade (SOG) - the 1st floor framing systems and utilities.

2. Perform a rapid site visit: complete a check list of items: photo documentation, overall general measurements, review the physical conditions of the structure, any landscape features, utilities, and adjacent structures.

3. Provide a rapid evaluation "RAPID ASSESSMENT" to determine a Go/No Go for each structure. **GREEN = Go, YELLOW =requires further research,** and **RED = No Go**

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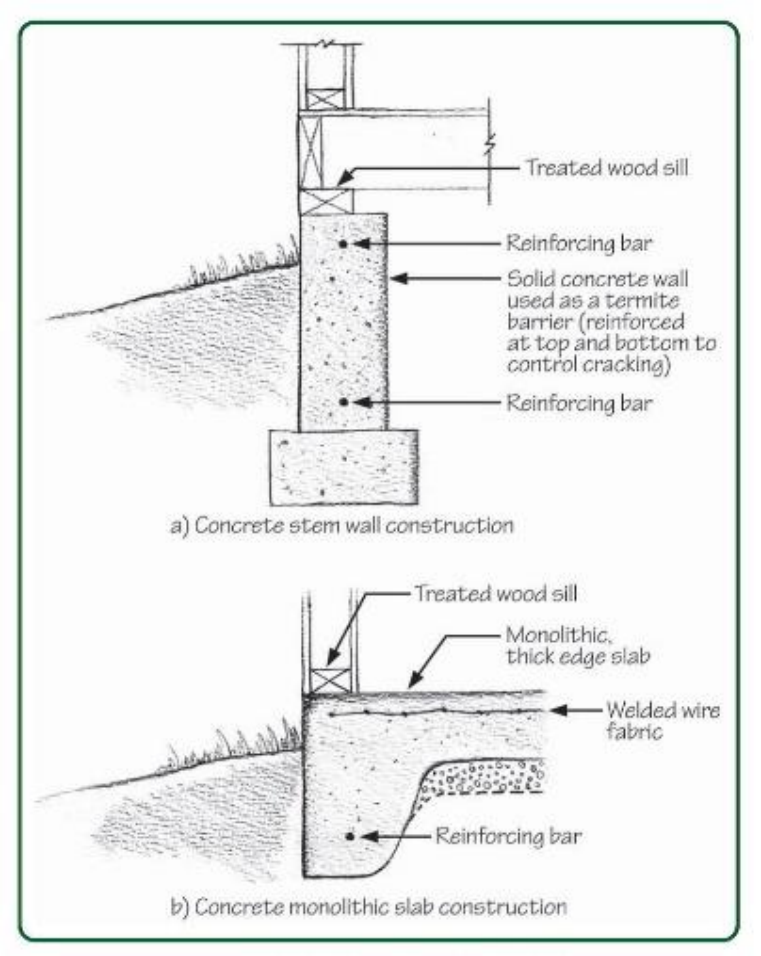
Verify Existing Conditions



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Step 2 – Civil/Soil "BFE" Assessment

1. Add to the available site data and supplement the documentation by meetings with Home Owners, the City and governing authorities.

2. Broaden the review and analysis of the existing site features & conditions: Base Flood Elevation - "BFE" - soils conditions – utilities, adjacent structures - basement, crawl space, SOG - the 1st floor framing systems and utilities.

Y

3. Update any data from structures posted as **"YELLOW" (requires further data)** from the "RAPID ASSESSMENT" to determine a Go/No Go status.

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Review Site Features

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Major landscape features, plantings and other site features will need to be surveyed and documented prior to design and engineering.

Any yard furnishings, plantings, or outdoor items that are required to be temporarily relocated will need to be identified and detailed.

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Step 3 – Architectural & Structural Assessment

1. Extend the research of the building structure from Home Owner meetings and expand the site visits – vehicle/pedestrian access, 1st floor elevation, lowest openings, utility connections/utility rooms, the floor framing system, and ADA-accessible entrances.

2. Perform a second site visit: further analyze the structural framing system, lifting and foundation options, and physical conditions of the building finishes. Start to generate conceptual design options that address the structure's new height, landscape/building features, utilities, and adjacent structures.

3. Provide an update to the rapid evaluation to determine any change in status of the **"RAPID ASSESSMENT."**

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Verify Existing Conditions

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Step 4 – Meet and Consult with Stakeholders

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1. Review the funding sources and review documentation from Home Owners, funding guidelines, and required codes and any specific requirements from the Stakeholders.

2. Review and communicate the civil/site/architectural/structural assessments with ALL the Stakeholders: i.e., lifting magnitude/process, "BFE", foundation options, entry/porch/stairway modifications, codes and the condition of the building.

3. Generate conceptual design options that address lifting the structure, landscape/building features, utilities, and adjacent structures.

4. Provide an update to the rapid evaluation to determine any change in status of the **"RAPID ASSESSMENT."**

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Communicate the Process

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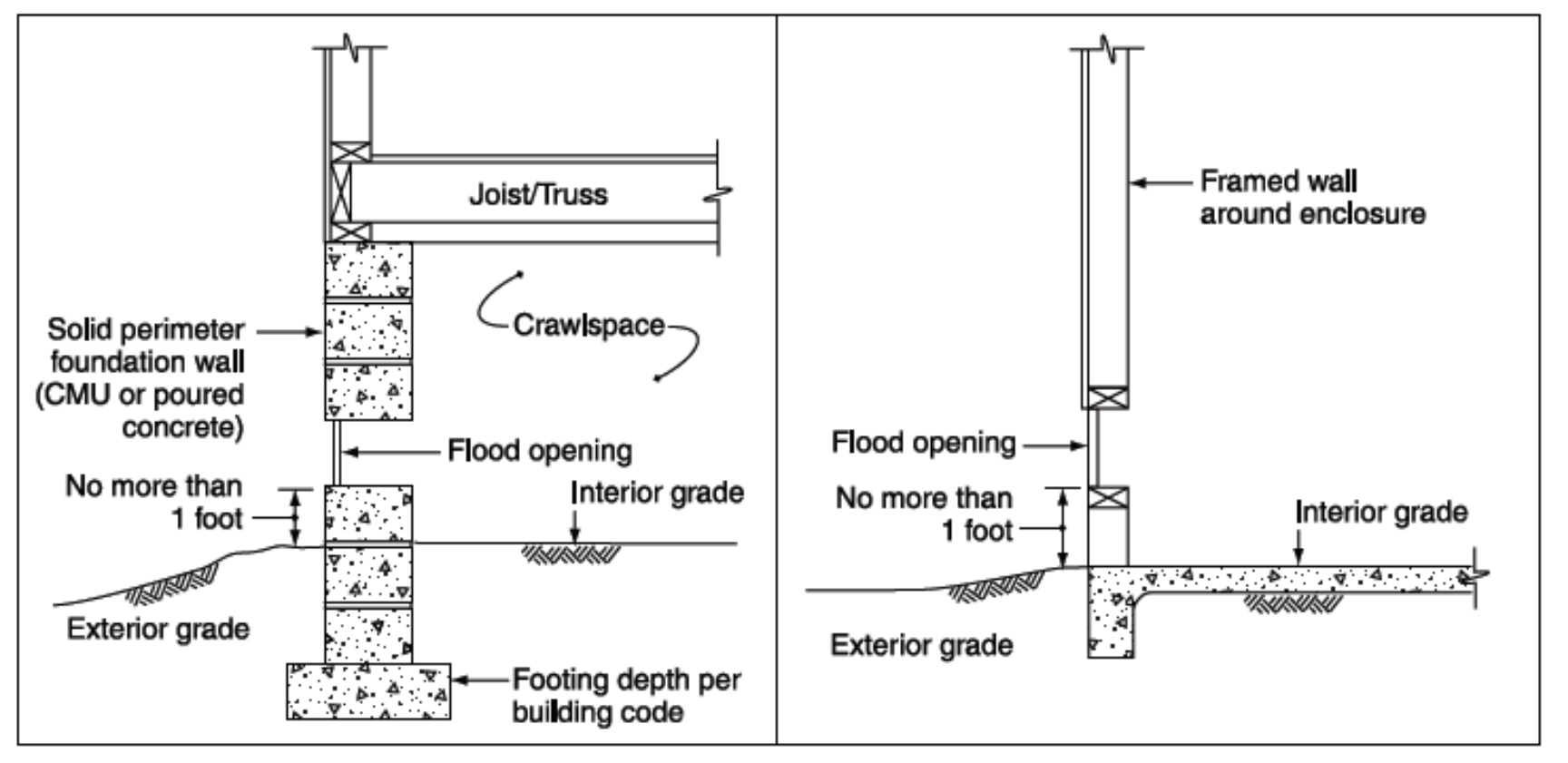
Review Solutions



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Step 5 – Design Options with Stakeholders

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1. Review the Agreements, Contracts and Requirements of the funding sources and further communicate to each Home Owner the code requirements and any specific requirements from the Stakeholders.

2. Update and develop the design options of the site/floor plans and meet/communicate with each Home Owner and ALL the Stakeholders: design solutions, review material selections, foundation options, entry/porch/stairway modifications, and code implications for the building.

3. Generate a budget estimate that addresses the design option, lifting the structure, landscape/building features, utilities, and adjacent structures.

4. Provide an update to the rapid evaluation to determine any change in status of the **"RAPID ASSESSMENT."**

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Material Selections

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Codes and Guidelines

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FEMA Publications

- FEMA Hazard Mitigation Assistance Guidance Addendum
- FEMA P-312: *Homeowner's Guide to Retrofitting*
- FEMA P-347: *Above the Flood: Elevating Your Flood-prone House*
- FEMA P-348: *Protecting Building Utility Systems From Flood Damage*
- FEMA P-259: *Engineering Principles & Practices for Retrofitting Flood-Prone Residential Structures*
- FEMA Technical Bulletins 1 - 11
- FEMA Publication No. 55

Local Codes

- City of Wheaton Building Code – 2018 International Residential Code/IBC with Amendments
- DuPage County Stormwater & Floodplain Regulations - with City of Wheaton Amendments
- Final Occupancy Certification & Final Elevation Certification

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Step 6 – Final Engineering

1. Review the final details of Agreements, Contracts, and Requirements of funding sources; and further address the code requirements and any specific requirements from the Stakeholders.

2. Finalize the foundation system, utility connections, and any site restoration caused by the lifting process. Finalize the site/floor plans, wall sections, details and review with the Home Owners and ALL the Stakeholders with one final review and approval.

3. Update the budget estimate that address any changes of the final engineered solution, landscape/building features, utilities, and adjacent structures.

4. Provide the out to bid package for competitive bidding.

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Bid Documents

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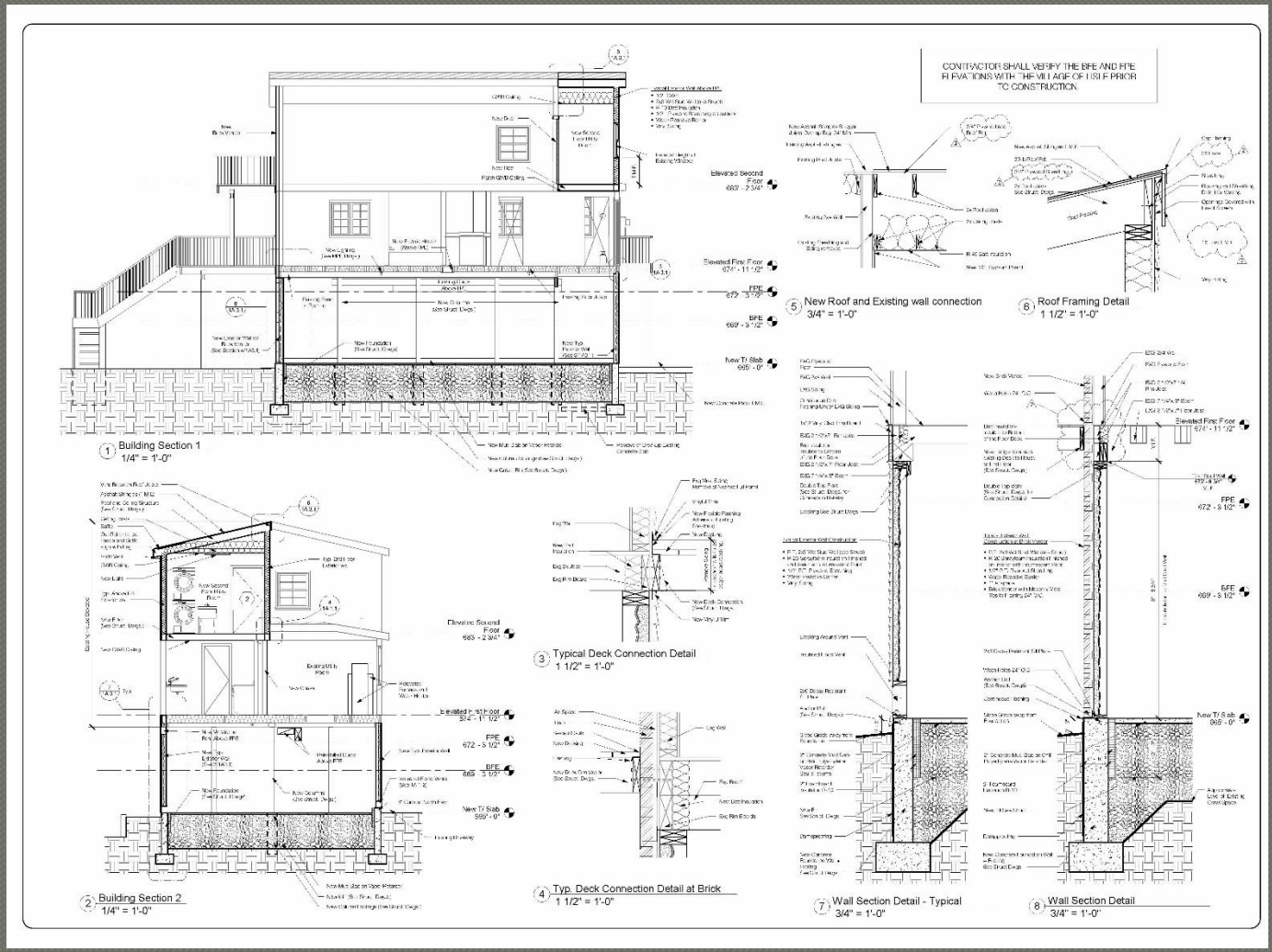

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Step 7 – Bidding/Construction

1. Issue Contract Documents to contractors for competitive bids.

2. Issue Documents to authorities for permit review and approval.

3. Answer questions during the bid phase and permit review process.

4. Review and qualify the lowest qualified bidders.

5. Tabulate bids and bidders and submit for final approval and authorization.

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Step 8 – Project Close Out

1. Review all close-out procedures of the funding sources and stakeholders.

2. Punch lists, start-up of mechanical equipment, and review and approval of all documentation - Home Owners, Code Authorities, and any specific requirements from the Stakeholders.

3. Final Occupancy permits, final survey, and sign-off of the "BFE."

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Lifting - Slab on Grade - "SOG"

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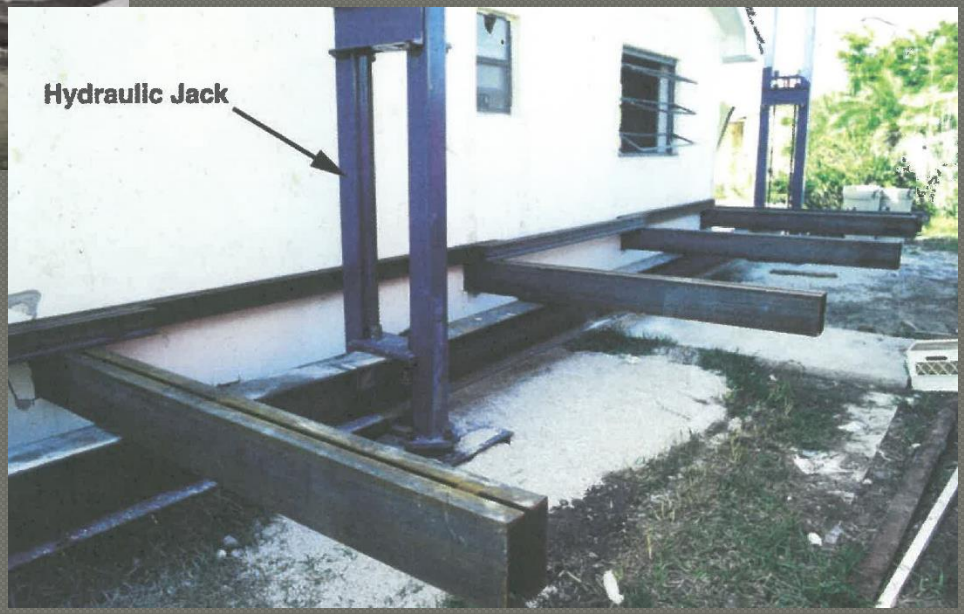

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Before Lifting

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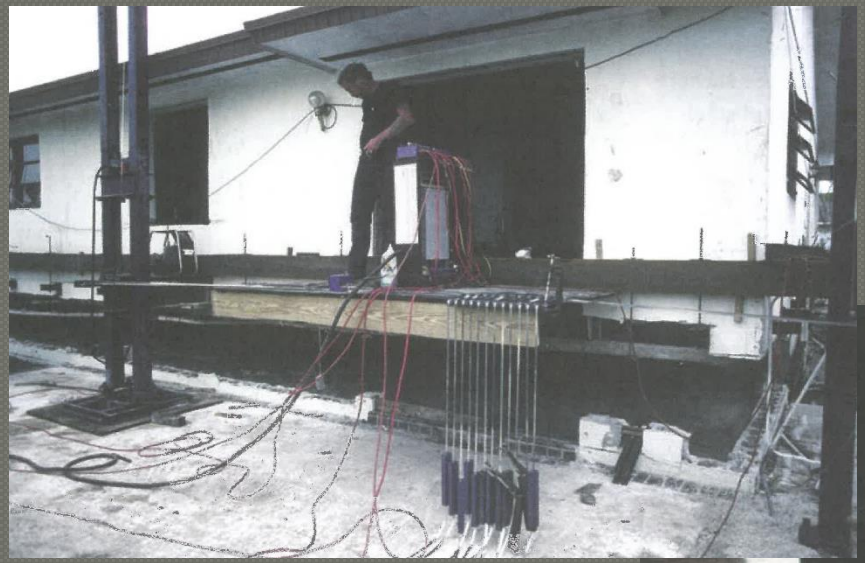

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During Lifting

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Continued Lifting

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Completed Elevated/Lifted Structure

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"Wood Frame"

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Similar Steps

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Completed Elevation

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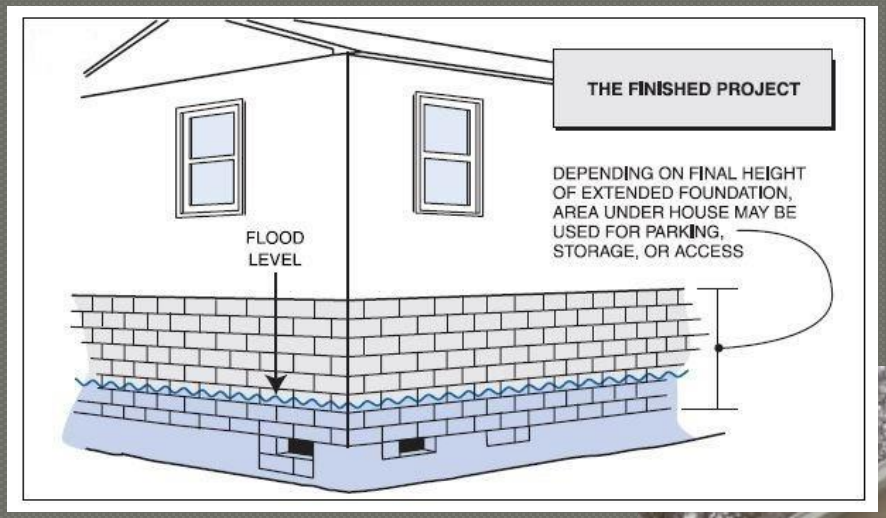

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Elevated Homes

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Pre-Planning Schedule

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TASK	DURATION of ACTIVITY
Project Start up	1 week
Execute Contracts	4 weeks
Kick-off meeting with all stakeholders	1 week
Subtotal	**6 weeks**
Field measurements/Existing conditions	5 weeks for field and office work
Soil tests and Foundation digging	1 week (weather permitting)
Meet with Homeowners	2 weeks during field work
A/E internal/Owner meetings	2 weeks concurrent with field work
Conceptual Designs	3 weeks for updates and revisions
City and Homeowner Review Meeting	1 week
Subtotal	**12 weeks**
Develop design concepts	1 week for development w/ engineers
90% CD's for City review	4 weeks for updates and meetings
Final PFG internal review	1 week for QA/QC – specifications
CD's to the City for Permit/Bidding	1 week for final review of CD's
Subtotal	**7 weeks**
Bidding	3 weeks
Bid review, contractor selection & approvals	2 weeks
Subtotal	**5 weeks**
Total	**30 weeks**
Mobilization and Preparation of Sites	1 month
Construction oversight	TBD
Final sign off / Elevation Certificate	TBD

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Preliminary Construction Schedule

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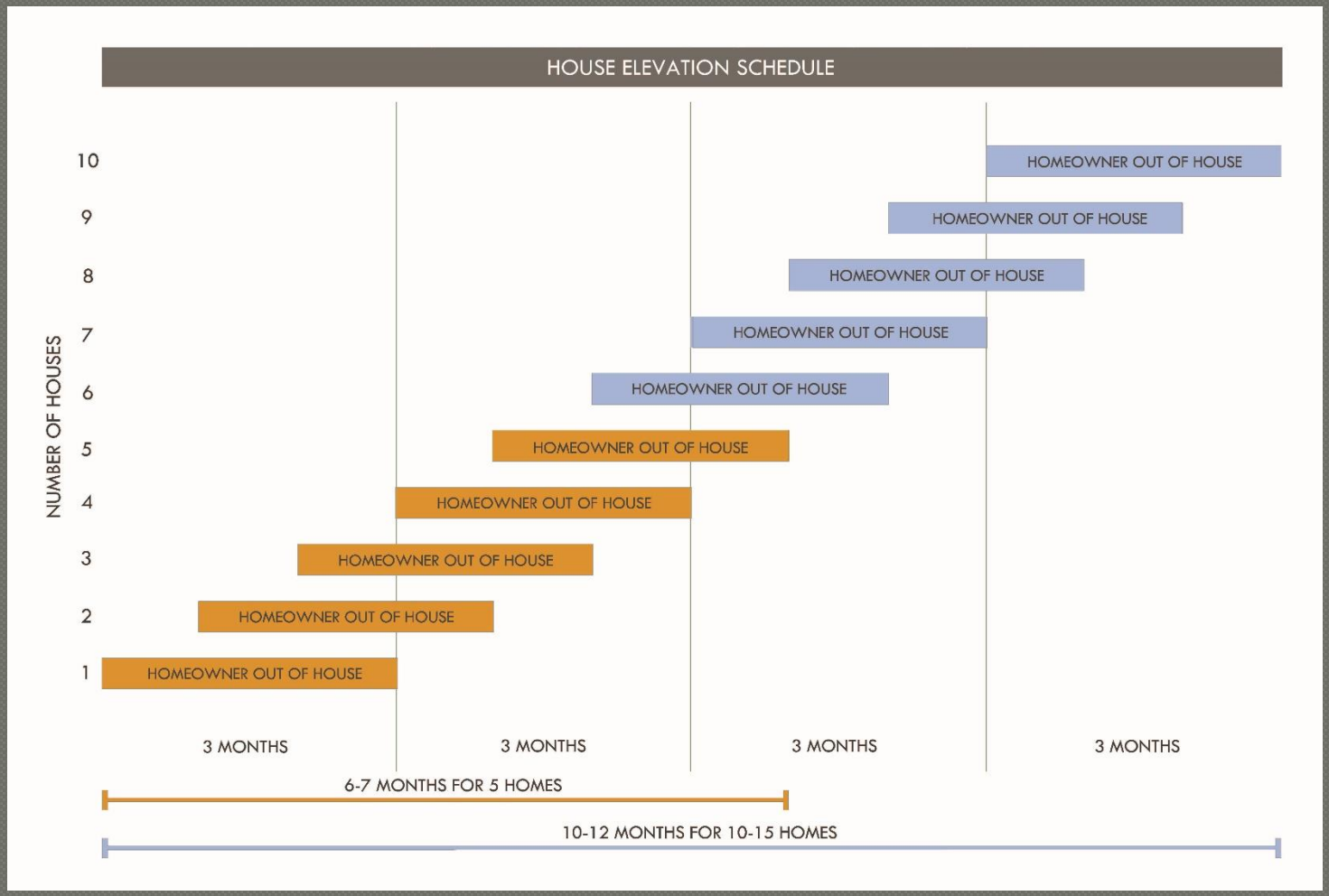

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Average Cost per House

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Rapid Assessment	$3,000 to $ 5,000
Soil/Survey/Civil Assessment	$5,000 to $ 7,000
Architectural Structural Assessment	$7,000 to $12,000
Architectural/Engineering Design	$7,000 to $15,000
Final A/E Design	$7,000 to $15,000
Mobilization/Demolition/Earthwork	$TBD
House Elevation Costs	$ 15,000 to $35,000
Foundation and Improvement Cost	$130,000 to $185,000
Chimney/ Code Deficiencies/Utility	TBD
Patios/Decks/Stairs/Landscapes	TBD
Contingency	TBD
Soft Costs (Permits/Abatement/Relocation Costs)	TBD

Probable cost of House Elevation between $175,000 and $275,000

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Questions & Comments

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Next Steps

1. Rapid Assessment
2. Public Relations + Funding Sources
3. Soil/Survey/Civil Assessment
4. Architectural Structural Assessment

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Examples

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Examples

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