A SunCam online continuing education course

A Practical Introduction to Zoning and Entitlements

by

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Table of Contents

- Loading
- Signage
  - *Building Mounted / Wall Signs:*
  - *Ground Mounted / Freestanding (Monument / Pylon) Signs:*
  - *Other Signs:*
  - *Other Sign Limitations*
- Fences
- Landscaping
- Site Lighting

Zoning Summary

E. Entitlements

State Requirements

- Department of Transportation (DOT) Approval
- State Waters and Flood Plain
- Wetlands
- Canal or other "protected lands" Commissions
- Other Miscellaneous Permits

County Requirements

Soil Erosion and Sediment Control Permits

Utility Providers

- Electrical
- Gas
- Water
- Sewer

Easement and Title issues

F. Final Approval and other Construction Related Entitlements

- Memorialization of the Board Resolution
- Engineering Sign-off
- Soil Moving Permit
- Zoning Certificate and Building Permit
- Inspections and Certificate of Occupancy

G. Summary and Conclusion

A. Introduction

This course is developed to introduce basic concepts associated with zoning and entitlements for those who are not experienced with land development, as well as to be a refresher to anyone who has worked in land development and/or has been exposed to zoning and entitlements requirements before. Understanding the basics of zoning and entitlements is important for any civil engineer who will be involved in a property development project.

Due diligence can be defined as "reasonable steps taken by a person in order to satisfy a legal requirement, especially in buying or selling something." The topic of zoning and entitlements should always bring to mind the topic of due diligence. Any property owner or purchaser who intends to develop the land must first perform due diligence either on their own, or but engaging the services of an expert such as a civil engineer who has experience with land development approvals.

This course can be used at a high level to help guide the due diligence process associated with confirming the risks associated with the required zoning and entitlements have been reasonably considered and explored.

B. Zoning Background/History

Zoning is a fundamentally basic component of the "land development process". There are several "types" of zoning, and the nuances of zoning can be varied, especially in international terms. This course will mainly focus on zoning implications as experienced in the United States. Property rights and real estate law and other laws related to permission to build (i.e. building permits) is generally beyond the scope of this course.

The topic of zoning can be traced back into antiquity and the laws established in Babylon, Greece, and Rome. That said, in general, zoning law in the United States began in the early part of the 20th century. Historically speaking in the early years of the United States, the idea of the government restricting how a property can be used was in general, minimal. Although specific areas may have been the target of specific government mandated building restrictions from time to time.

In 1915 construction was completed on a 40 story building in lower Manhattan known as the Equitable Building. The building reportedly cast a shadow that could be measured as large as seven (7) acres. As a result, The City of New York adopted a code referred to as "the 1916 Zoning Resolution". This was the first zoning law in the nation with a municipal (city) wide application. It is interesting to note that this resolution actually resulted in skyscraper styles that became so popular that they were replicated and implemented in other cities around the world; even though the architects were not limited by the restrictions that drove the style.

In 1922, the US Department of Commerce issued a "model law" for states to adopt, which was known as a Standard State Zoning Enabling Act or SZEA. By 1926 it was acknowledged that 19 states had already passed laws based on the standard SZEA. In 1926, a land owner in Ohio attempted to challenge the constitutionality of zoning ordinances in a case known as "Village of Euclid, Ohio v. Ambler Realty Co.". Ultimately, the US Supreme Court upheld the constitutionality of zoning laws, and the precedent was set, therefore zoning law was here to stay.

Most of this course will identify terms and provide examples so that the student can develop a clear understanding of these terms. This course will also identify general processes that can be expected to be encountered associated with the approval process related to the development of land.

C. Modern Zoning

Introduction

As zoning became a practical reality, the various cities and municipalities adopted laws to govern the process. In general, the philosophy of zoning is that certain activities or uses of the land within a local government's jurisdictional approval authority can (and should) be grouped together so as to maintain order, quiet, and safety, especially on behalf of residential occupants, and to manage and minimize traffic. As an example, the laws are intended to make it so that someone can't buy a house in a quiet neighborhood, and then tear it down and open a slaughter house or a chemical processing plant on the lot. The intent could be seen generally as to protect the public health, safety, and welfare.

To that end, the law in the municipalities invariably guide a process of defining uses and limitations within zones. In practical terms the typical zoning code has two aspects, a textual portion that outlines the regulations for the various zones, and also a map that identifies the zoning designation for each tax lot / existing property parcel throughout the municipality or county. It is worth noting that often times the zone was established based on the existing use or preponderance of uses in an area, but many times the zone reflects what the governmental authority having jurisdiction wanted/wants that area to become when the code went/goes into effect or as the desire evolves over time. In all cases, the ordinance defines the process that allows the zoning map / plan to be changed. How this occurs varies and will be touched on briefly later.

As will be discussed later, the law or code that defines the zoning is typically referred to as the zoning ordinance. Zoning ordinances traditionally govern and regulate the use, the height and the bulk that is permitted on the properties within each zoning district. Contemporary zoning ordinances may include architectural requirements that attempt to enforce compatibility of architectural aspects of the buildings within zones.

In general terms, prior to issuance of a building permit, an application typically receives a "zoning review" by the Zoning Officer, or other individual with review authority, and this person confirms that if required, the required zoning and land use approval process has taken place. If the Zoning Officer deems that the building permit application requires a variance approval, or some other formal site plan approval, then the permit application is rejected and the applicant is directed to obtain said approvals. Since

design professionals and legal counsel understand this, they advise their clients when needed, to proceed with site plan approvals and entitlements before pursuing building permits.

It is always a good idea to perform the appropriate due diligence to determine the zoning of a property as well as the authorities having jurisdiction. Often times in rural areas, the zoning is governed by the County rather than the Township, or perhaps there is a redevelopment ordinance or regional agency that has jurisdiction over the zoning of the property. Knowing this information is critical in the efficient and effective planning of a site.

Ordinances

As noted above, the law that governs zoning is adopted as an ordinance. Typically the jurisdiction will have a Zoning Ordinance, or a Zoning Section of a Land Use Ordinance. Some times and more frequently in urban and "city" environments, the zoning ordinance may be rolled into the building code. It is important for the land use / civil engineer to obtain a copy of the latest ordinances as these laws are constantly changing and being updated, and the best way to avoid proposing a site feature out of compliance is to make sure you have thoroughly reviewed the applicable portions of the most currently available ordinance. Many times nowadays these ordinances are available online, but it is always best to check with the zoning and/or land use office of the authority having jurisdiction.

Zoning Map

The municipality will typically have an official Zoning Map on file and available for review or for obtaining a copy of; for a small fee. Many Zoning Maps have been posted online with the ordinances available through the Municipal website. The engineer should always review the tax maps against the zoning map as well as the survey to confirm a good understanding of what the zoning is in view. (Refer to Figures 1 "A", "B", "C" & "D" for a sample of what a zoning map can look like):

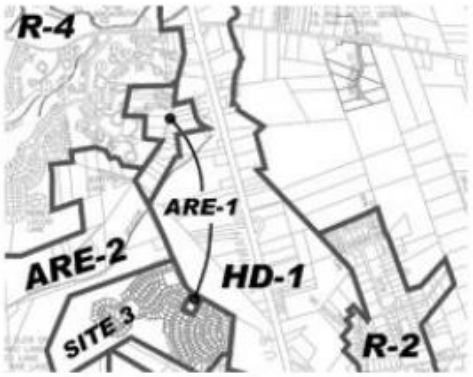

FIGURE 1A

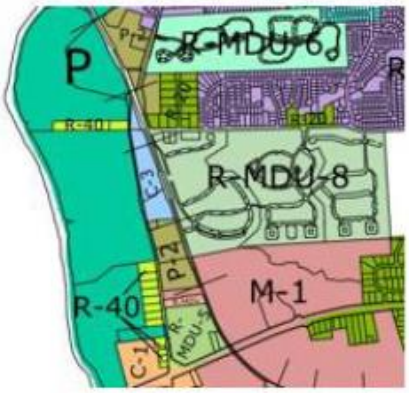

FIGURE 1B

FIGURE 1C

FIGURE 1D

Figure F-1 (A, B, C, & D)
(Some sample images of sections of various Zoning Maps)

Master Plan

One way that the municipality is able to adjust the zoning is by updating the Master Plan. Typically the ordinance will define the process that the municipality is to follow in reviewing and reapproving their Master Plan with some degree of frequency. It is worth noting that in the past, developers with enough foresight and connection, have been able to have the zoning adjusted for a specific property by lobbying appropriately during the Master Plan review process. This has been successful because the town may recognize that the developer will bring a tax increase to their jurisdiction if they can accommodate the needs of the developer. Of course, ethics would dictate that the municipality should only do so if the revised zoning remains generally consistent with

the surrounding zones and uses of the properties adjacent and is in the best interests of the residents.

Approval of Zoning Change Process

Another method of changing the zoning is by an approval of a zoning change by application. Typically the ordinances define the process a developer or land owner must follow in order to petition and have approved a change to the zone designation to a piece of land. The approval application will be presented before a board often called the Zoning Board or Zoning Board of Adjustment. And the approval process will be documented in the public with a hearing and notice to adjoining properties, etc.

This is the ideal way for changes in zoning to occur from a purely legal perspective, which provides the best environment for changes consistent with good city planning to occur, and to best protect the public. However this is frequently a time consuming and costly process, with no guarantees of success, not to mention if it is successful, the process of approval for the development itself is also still a long term process. As a result, this avenue is pursued less frequently than perhaps would be considered ideal.

Use Variance Approval Process

In practical terms, the other method of changing the zoning on a piece of property which is fairly common, is for a developer to submit a site plan application for approval that includes a use variance. A use variance can be defined as a proposed use on a property that does not comply with the uses that are allowed on that property as defined in the Zoning Ordinance. While this is the fastest way for a developer to obtain approval for their project, the residual effect of this method is a municipality that may have areas that are not consistent with the intent of the Master Plan. Due to the practical constraints of time, the municipalities rarely proceed with updating the Master Plan to reflect the Use Variances that have been approved. This may leave the property in a state of existing non-conformity for the future which may make future development challenging.

Overview of Boards

Jurisdictions will define how the approval structure is established and how that authority will function to allow approval of subdivisions and site plan developments. There may

be Planning Commissions, Zoning Boards, Zoning Boards of Adjustment, Planning Boards, County Commissions, and City Commissions, etc. The state and region the project typically has similar code defining each. The engineer should always direct the client to the Land Use Attorney to guide them through the process. In addition to what each board has jurisdiction over, there are other distinctions with respect to how these boards function. For example, in one Jurisdiction the Planning Board may consist of 9 members that required a simple majority (i.e. 5 votes *or 4 votes if only 7 members are present*) for approval, while the Zoning Board may be a 7 member board requiring a super majority (i.e. 5 votes) regardless of the number of board members in attendance at the hearing/meeting.

In general terms, the Planning Board has jurisdiction over site plan applications and subdivisions while Zoning Boards have jurisdiction over Use Variances. The next section will discuss in more detail, the specifics encountered in the various zoning and land use ordinances.

It is also worth noting that the boards or the process in the jurisdiction may have established other sub-committees or sub-boards that may have either authority over the application, or may merely be an advisory committee to the actual board having jurisdiction. Among these are Architectural Review Boards or committees, and Planning Committees.

D. Zoning Terms and Components

Variances and Waivers

The terminology associated with proposed items that do not conform to the requirements of the ordinance are referred to as variances and/or waivers. The term variance is typically used associated with any item required by the ordinance that is not being or able to be complied with on the plans associated with the submitted application. In general, the term "waiver" is related to an item that might be required by the site plan approval application checklist or an engineering standards criteria item that is a standard in the municipality, but is not being provided.

For example, perhaps the project is an oversized deck on a small 0.5 acre residential lot by a private home owner, but the standards require an applicant to provide all utility information within 200' of the site on the plans associated with the application. In this case, perhaps to save budget and funding the application will identify a waiver request on obtaining and providing utility information beyond the property lines. Perhaps, and in all likelihood, they board will approve a waiver of this nature if they approve the oversized deck.

Often it is useful to identify the "existing non-conformities" on the site which may help to justify the variance. An example might be a site plan approval on a 1.6 acre lot where the minimum lot size in the zone is 2 acres. Since the lot variance is a function of the existing lot size, calling out existing non-conformity on lot size rather than variance may be acceptable. Of course there are nuances in every jurisdiction and the applicant's attorney should make the final decision as to how these items are represented, and on the relief they wish to have requested in the approval resolution. The engineer's initial job is to identify all of the information for the attorney so that the appropriate case is made, so that the owner, if obtaining approval, also has protection against future claims by others.

Districts and Uses

Although the terminology may differ from jurisdiction to jurisdiction, typical zones or "districts" found in zoning ordinances are based on Residential, Business/Commercial, Industrial, and/or Agricultural. The titles of specific zones can be extremely varied, such

as, Small Business, Highway Business, Office, Planned Unit Development, Residential Light Commercial, Agricultural, Farm, Town Center, etc. The list goes on and on.

Each district listed on the Zoning Map will have a section in the Ordinance defining the district as well as the permitted uses and other limiting factors associated with the zone.

The types of uses are as varied as can be imagined, and most ordinances do a very good job of defining what uses are permitted in what zones. Uses that could be encountered basically describe what the site will be used for: Manufacturing, Mall, Two-Family Residents, Office Space, Commercial, Gas Station, Convenience Store, Restaurant, etc. If the proposed use is not identified as permitted in the zone, then the expectation should be that a use variance will be required.

Bulk Requirements

Typically the zoning ordinance will define the "Bulk Requirements" for the site (as opposed to "Use Requirements"). This is often found in a chart listing the categories that each zone has the values defined for. The typical bulk requirements expected are categories such as:

- **Minimum Lot Size** – This is the smallest area a parcel can be in the district when subdividing. Existing non-conformities will typically obtain a hardship variance from the board if the existing lot in a site plan application is already too small. While the existing lot size may be used to justify other variances, it can alternatively be used by the board as the reason to deny the application outright.

- **Maximum Building Height** (in terms of feet and/or number of stories) – This is the highest a building can be in a zone.

- **Maximum Building Area** – This is the largest area the footprint of the building can be on a lot. This is often limited as a percentage of the lot size.

- **Maximum Floor Area Ratio (FAR)** – This is the ratio of the maximum building floor area that is permitted and the lot/site size. (Refer to Figure F-2 and Equation E-1)

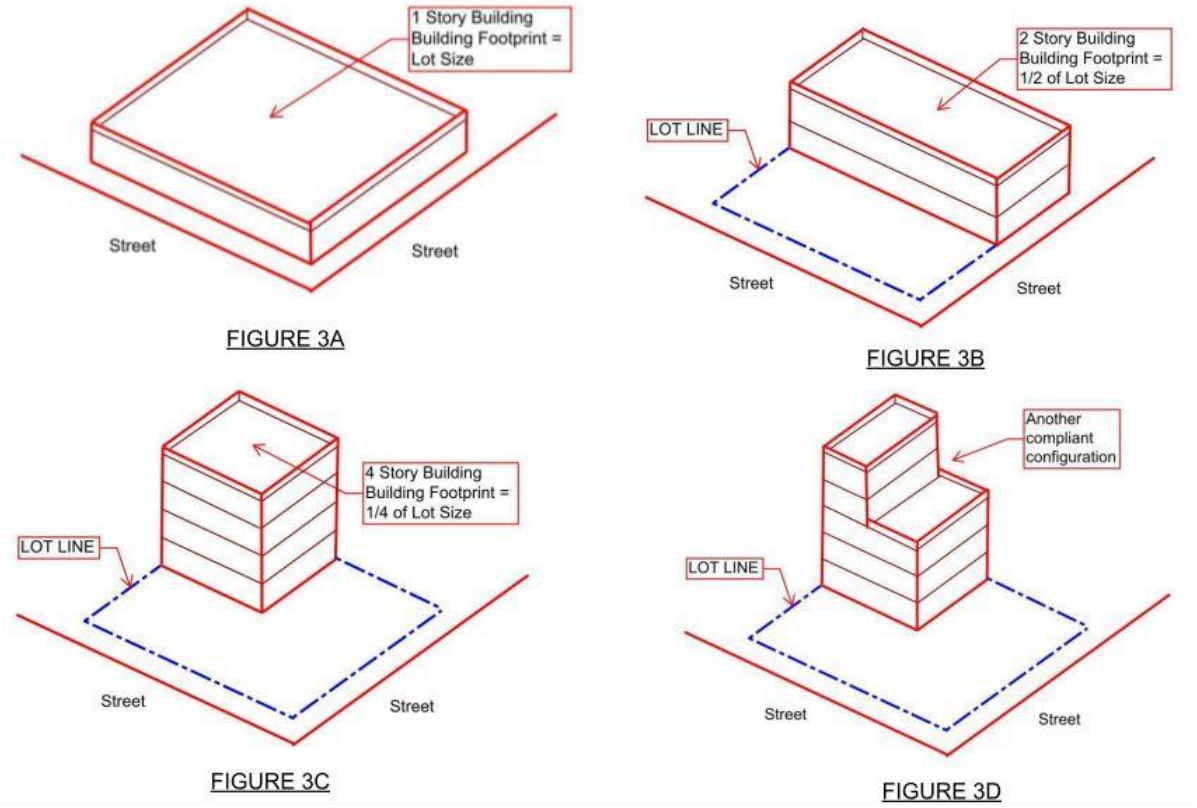

Figure F-2
(Examples of a Compliant Site with FAR = 1.0)

$$FAR = total\ floor\ area\ (all\ floors)\ /\ size\ of\ site$$

EQUATION E-1

- **Maximum Lot Coverage and/or Maximum Impervious Coverage** – This is the maximum percentage that a lot can be covered with impervious surfaces such as building roof, parking lots, driveways, and sidewalks. Often times the area of the above ground detention basin is interpreted as an impervious surface, but this should be confirmed with each jurisdiction. Also, the engineer should confirm how the jurisdiction will interpret the use of “pervious pavement” on a site, as they will often still consider this impervious for the purposes of lot coverage.

$$\%\ Coverage = \frac{total\ impervious\ area}{area\ of\ site}\ x\ 100 =$$

EQUATION E-2

- **Setbacks:**

  - *Front Yard* – This setback is the minimum distance that the building can be from the front property line. It is worth noting that on a corner lot (i.e. a lot fronting on two intersecting Rights-of-way (ROW), various jurisdictions will have different interpretations of the "front property line".

    Sometimes it is both, and sometimes one is considered the front, and one is considered a side property line. (Refer to Figure F-3 for a picture of a Front Yard Setback with the "plane" of the ROW and setback lines graphically depicted, and Figure F-4 for an Example of a Survey with the Front Yard Setbacks Shown.)

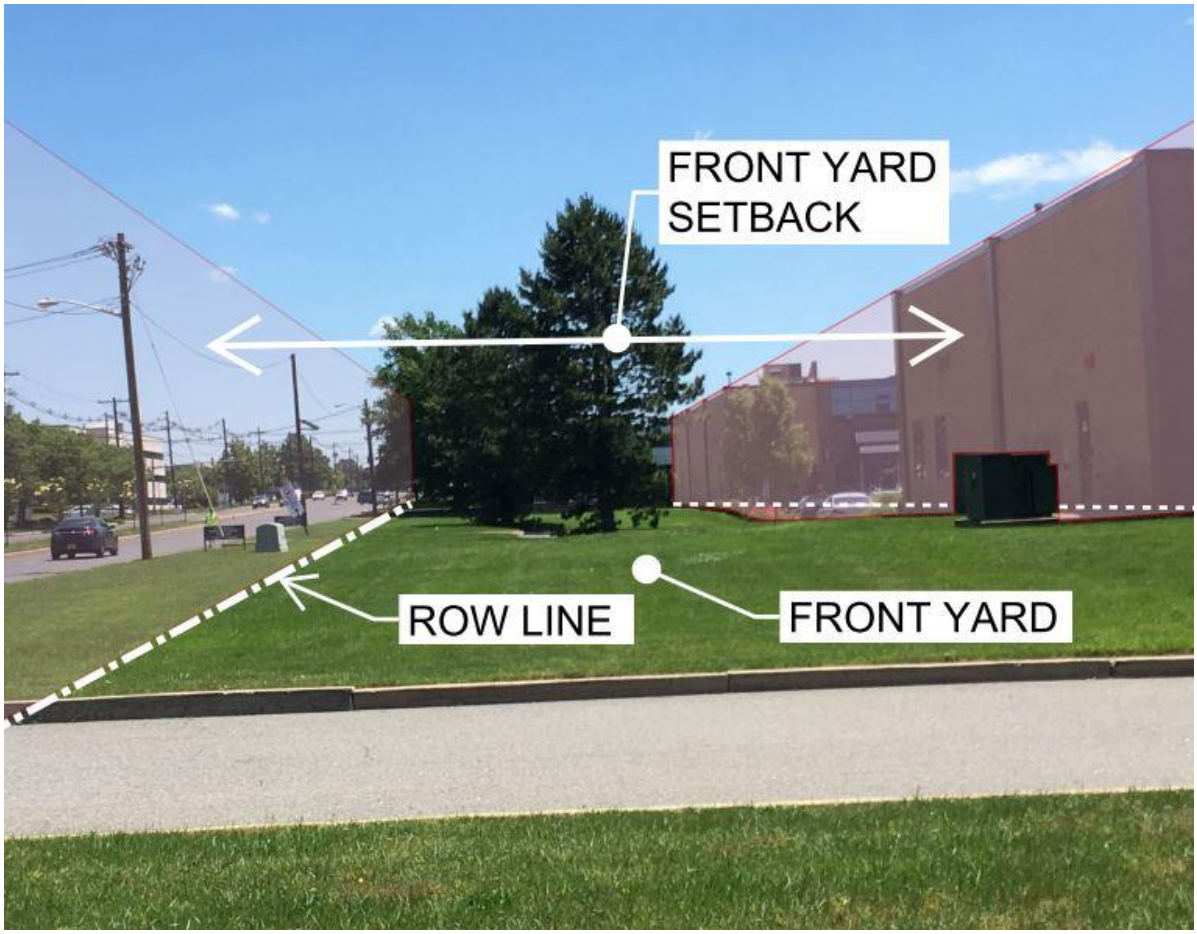

Figure F-3
(A picture of the front yard "setback" on a building)

- *Rear Yard* – This setback is the minimum distance the building must be from the rear property line. On irregularly shaped lots, the engineer should confirm how the rear property line is defined, and it is often only the one line opposite the front, but it can be any line not defined as a side property line.

- *Side Yard* – This setback is the minimum distance the building must be from a side property line. The side property line can be defined in various ways, but is often any property line that ties into the ROW / front property line. It is worth noting, sometimes the ordinance will also limit the total of

both side yard setbacks combined, or it may define the first side yard setback and the second as a lessor setback.

Figure F-4
(Example of 75' Front Yard Setback on a residential survey)

- **Minimum Greenspace** – This is a variation on lot coverage where the site must have a minimum certain percentage of grass and/or landscaped (non-impervious) areas.

- **Buffer** – This is a required greenspace between the property line it is defined against and any impervious surfaces. For example if a front yard buffer of 15' is required, then the parking lot must be set back 15' from the ROW / front property line. (Refer to Figure F-5 for an example of a buffer between the ROW and the parking lot).

Figure F-5
(An Example of a Buffer in the Front Yard of a commercial property)

- **"Step Backs" and Sky Exposure Plane** – In some cities, the front walls of buildings at the ROW or street line setback may be limited to a specified height or number of stories. In these cases, above the specified height, the buildings are required to set back behind a theoretical inclined plane, called the "sky exposure plane", which the building's exterior wall is not permitted to penetrate. Although in some cases, the sky exposure plane may only be required to a certain elevation, at which height, the "sky is the limit" associated with the max building height within another final setback. (Refer to Figure F-6 for a graphical depiction and photograph example of sky exposure plane).

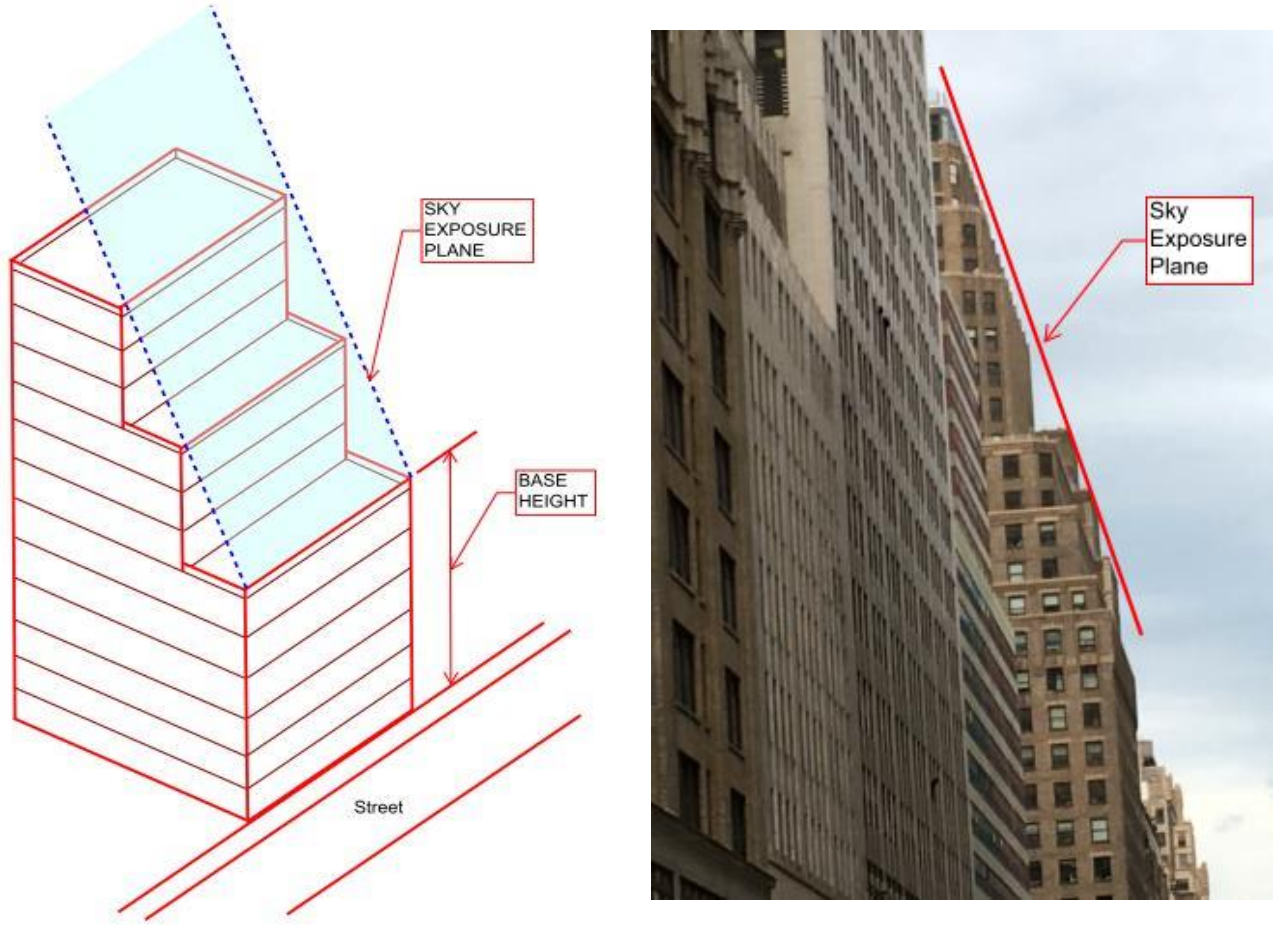

Figure F-6
(Graphical Depiction and Picture of "Sky Exposure Plane")

- **Accessory Use Setbacks** – Often times the bulk requirements will identify the setback required for accessory uses (such as sheds, detached garages, etc.)

It is worth noting, occasionally a jurisdiction or state will have tied an apparent bulk requirement to the use approval process. For example, in one State if the height of a building in an otherwise use compliant site exceeds 10% of the Maximum Building Height requirement, the application for approval must go before the Board that approves use variances.

Some sample calculations associated with some Bulk Requirements are as follows:

P-1) If the Max FAR on a 1 acre site is 0.5, how large can a building footprint be on a 3 story building of equal sized floors?

Solution:

Step 1: Convert site to SF
1 acre = 43,560 SF,
Step 2: Calculate the max allowed floor area
(For FAR 0.5, max permitted floor area is 0.5 x site size)
0.5 x 43,560 = 21,780 SF allowed
Step 3: Calculate the max allowed floor area per floor
(For max permitted floor area of 21,780 SF on three floors, divide 21,780 by 3)
21,780 / 3 = 7,260 SF therefore
ANSWER: A 3-story building with a 7,260 SF footprint may be constructed on site

Problem P-1 (above)

P-2) How many equally sized stories can a building with a 14,520 SF footprint be, on a 3 acre site if the Max FAR is 2.0?

Solution:

Step 1: Convert site to SF
3 acre = 130,680 SF,
Step 2: Calculate the max allowed floor area
(For FAR 2.0, max permitted floor area is 2 x site size)
2 x 130,680 = 261,360 SF allowed
Step 3: Calculate the number of floors
(For max number of floors, divide 261,360 by 14,520)
261,360 / 14,520 = 18 therefore
ANSWER: An 18-story building with a 14,520 SF footprint
and equally sized floors may be constructed on site.

Problem P-2 (above)

P-3) How large does a site need to be if the max lot (impervious) coverage is 85% and there is a combined proposed building and parking lot that covers 21,250 SF?

Solution:

Step 1: Calculate the site size needed
(for max coverage 85%, the max impervious allowed is 0.85 x site size
Therefore, the required site size is the amount of impervious / 0.85)
21,250 / 0.85 = 25,000 SF site needed
Step 2: convert to acres
(1 acre = 43,560 SF)
Therefore 25,000 / 43,560 = 0.57 acres
ANSWER: A 0.57 acre site can accommodate 21,250 SF of coverage

Problem P-3 (above)

P-4) In an R-2 residential district with a minimum 2 acre lot size zoning requirement, how many residential lots can be created out of an existing 12.25 acre lot that will require a 32,670 SF cul-de-sac in the right-of-way?

Solution:

Step 1: Calculate the available area left after required ROW dedication
(32,670 SF = 0.75 acre. 12.25 – 0.75 = 11.5 acres left)
Step 2: divide available acreage by min. lot size
(11.5 acres divided by 2 acre zoning)
Therefore 11.5 / 2 = 5.75 Lots
ANSWER: Five (5) 2-acre sites can be created in the subdivision
with 1.5 acres left over.

Problem P-4 (above)

Engineering Design Standards

Sometimes within the zoning or land use ordinance, certain design standards are defined. However, these items could merely be identified in another section of the municipal code, or even just in a design guidelines manual put out by the engineering or public works departments.

Other Requirements

Typically the zoning ordinance will identify several other site requirements in various locations, sometimes as part of the bulk requirements, and sometimes requiring deeper investigation. The engineer should take the time to find and review these sections and identify the requirements to that they can be reflected on the plans and ultimately approved by the board.

Some of these sections are as follows:

- **Off Street Parking** – One of the most important sections of the ordinance to confirm the requirements of is the off street parking section. The parking ordinance will always play a significant part in the development of the site plan layout as this section defines many of the parameters required in order to design a compliant parking lot. For example, the parking ordinance will define how many spaces are required for the building based on the use.

  Number: The number of parking spaces required are specific to each authority having jurisdiction, however some common examples of required spaces requirements are for example:

  - Offices/Business - 1 space for every 300 square feet of floor area
  - Retail - 4 spaces per 1,000 square feet of floor area
  - Restaurant – 1 space for every 3 seats
  - Golf Courses – 5 spaces for each tee
  - Tennis Courts – 6 spaces for each court
  - Bowling Alley – 5 spaces per lane
  - Industrial uses - 1 space for every 300 square feet of floor area
  - Warehouse use - 1 space for every 300 square feet of floor area

- Churches and other places of Worship - 1 space for each 3 seats, or 1 space for each 72 inches of seating space when benches rather than seats are used, or 1 space for each 30 square feet of all assembly area capable of being used for worship and where seating is not an applicable standard

(Of course these are just examples, and the municipal specific ordinance should always be referred to for a specific project.)

Size and Orientation: The size of the parking spaces can range. While the standard parking space in general terms may be defined as a 9' wide x 18' deep space, the ordinance may require spaces to be something more. Additionally, sometimes the ordinance will allow for a certain number of compact spaces, etc. that will also have defined dimensions. The sizes may also be defined in the ordinance based on if the spaces are oriented 90° degrees, 60° or 45°. Parallel parking space requirements are also typically defined here.

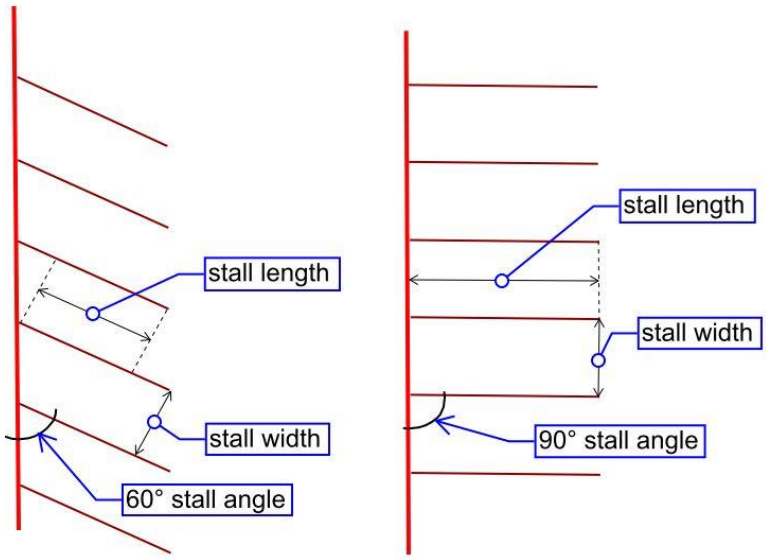

Figure F-7
(Graphical Depiction of 60° vs. 90° parking spaces (Plan view))

Accessible Parking: In the United States, it is worth noting that if the number and location of accessible parking spaces is not clearly defined in the ordinance, it

will still need to comply with the American's with Disabilities Act (ADA) requirements, mandated throughout the nation.

Circulation: The off street parking section will typically define the minimum width for circulation lanes around the parking lot. It is worth noting that when parking is 90° the circulation route can be "two way" and as a general rule should be approximately 24' wide. On angled parking, the circulation will typically be required to be laid out in the direction of the parking and the minimum width of the lanes will be defined.

Other Parking requirements: Often times the parking ordinance will identify if there are any requirements for longitudinal "islands", "peninsulas", and/or end caps required with some frequency throughout the parking field.

It is worth noting in this section that a buffer requirement may be defined in a location other than in the bulk requirements, as a result, when confirming the parking requirements, it is a good time to search for any buffer requirement so as to not conceptually propose the parking lot within a required buffer.

A sample parking calculation is provided in P-5:

P-5) How many parking spaces are required for a new 6,000 SF restaurant with 200 planned seats, if the ordinance requires 1 parking space for every 300 SF of retail and 0.7 parking spaces for every 2.5 seats in a restaurant?

Solution:

Step 1: Calculate the number of spaces required for the restaurant
(Note: "Retail" requirement is not applicable)
(200 seats / 2.5 = 80 spaces; 80 x 0.7 = 56 spaces)
ANSWER: Fifty-six (56) parking spaces required

Problem P-5 (above)

- **Loading** – Many uses will have the number of loading spaces required by the ordinance. The ordinance will typically define the length, width, and height required for a valid loading space. Many uses will require the loading spaces to

be associated with a loading dock which may have engineering standards associated with slope, etc. beyond the scope of this course.

- **Signage** – The signage ordinance needs to be understood if the applicant intends to propose signs on their building or property. There are several aspects of the sign ordinance that are fairly typical:

  Building Mounted / Wall Signs: The building mounted section of the sign ordinance will typically identify the maximum height, maximum width and maximum area of the signs. The number of building mounted signs permitted on the building façade may be defined, and limitations to signs mounted on other faces of the building may be defined (such as sides or rear). All of this is important as many retail establishments and restaurants desire corporate or brand logos on all four (4) sides of the structure, and the signage may be limited.

  Another way in which the signage may be limited is for the max sign area to be based on a percentage of the size of the front building façade. Additionally, often times if multiple signs are permitted on a façade, the maximum sign area will be based on an "aggregate" of all the signs. For signs that are not rectangular based, the area may be limited to the product of the largest vertical and horizontal dimension. A sample building mounted sign calculation is as follows:

P-6) On a building front that is 100' wide by 30' high, does a proposed building mounted 10' x 20' sign comply with an ordinance that limits the wall mounted signage to 10% of the front façade?

Solution:
Step 1: Calculate the size of the building front
(100' x 30' = 3,000 SF)
Step 2: Calculate the allowable sign size
(0.10 x 3,000 = 300 SF)
Step 3: Calculate the size of the sign
(10' x 20' = 200 SF)
ANSWER: Yes, a 200 SF sign is compliant with the ordinance.

Problem P-6 (above)

Ground Mounted / Freestanding (Monument / Pylon) Signs: The ordinance will typically identify limitations of freestanding signs. This may be either associated with "Monument" signs (low signs mounted to the ground), "Pylon" signs (High signs supported by a monopole), or both.

The ordinance will typically identify the following types of parameters: maximum sign area (1 side or both), maximum height, maximum vertical dimension of sign, maximum width of sign, maximum number of signs on site, etc. As is the case with building mounted signs, for signs that are not rectangular based, the area may be limited to the product of the largest vertical and horizontal dimension.

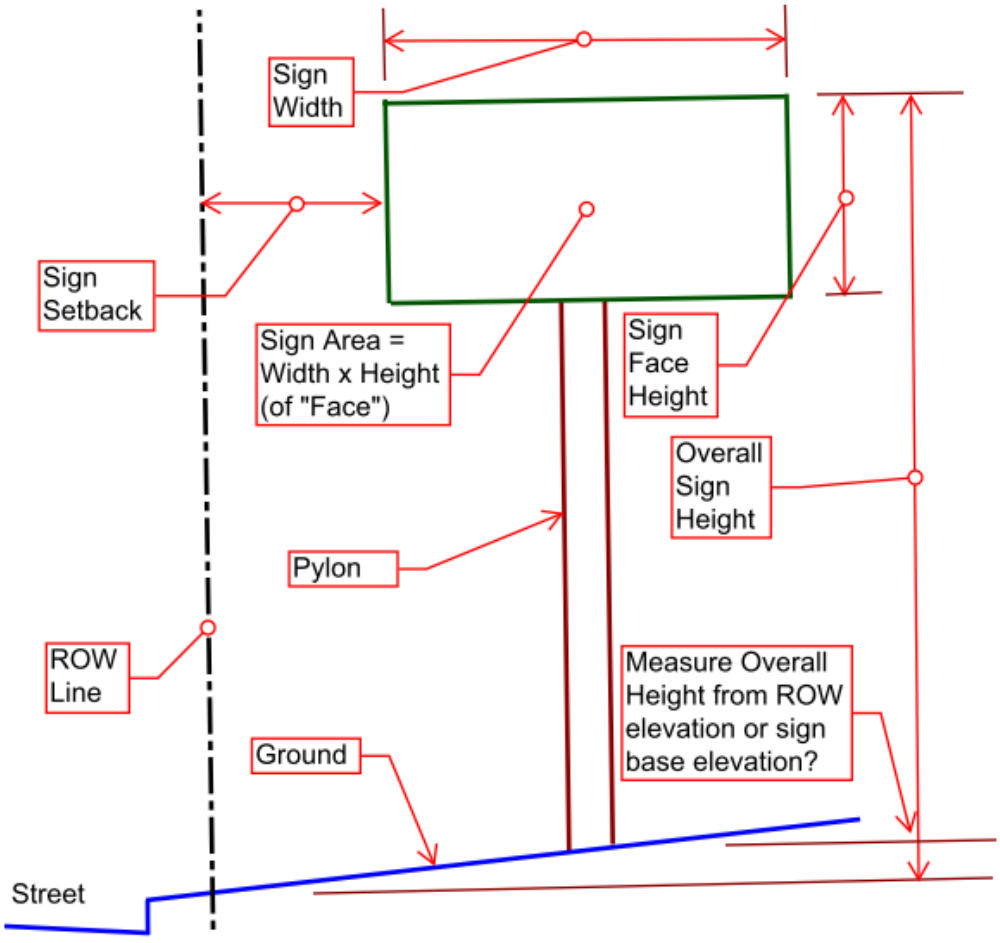

Figure F-8
(Graphical Depiction of a "Pylon Sign" & Applicable Parameters (Elevation view))

Other Signs: Other signs that may be discussed in an ordinance could include, (but is not necessarily limited to):

- Window signs
- Awning signs
- "Projecting" signs
- Signs with "changeable copy"

Other Sign Limitations: the ordinance will typically identify how signs may be lighted, and if neon is permitted, or if they are allowed to be internally illuminated.

Figure F-9
(Some Examples of "Projecting Signs")

Figure F-10
(Some Examples of "Window Signs")

P-7) A 10’ x 20’ pylon sign is proposed on a site that allows the maximum freestanding sign to be 150 SF. Is a variance required?

Solution:
Step 1: Calculate the size of the proposed sign
(10’ x 20’ = 200 SF)
Step 2: Compare against the allowable sign size
(is 200 SF less than 150 SF? No)
ANSWER: Yes, a Variance is required to install the sign.

Problem P-7 (above)

- **Fences** – The ordinance will frequently have a section associated with fences. This may limit the height of fences permitted on site, the type, the minimum or maximum amount of opacity permitted/required on a fence, and may also identify a front yard setback for fences or a max fence height limitation in the front yard or to a certain setback. (Refer to Figure 11 for some fence examples)

Figure F-11
(Some Examples of Fences that may have been limited based on Zoning)

- **Landscaping** – The Zoning / Land Development ordinance will often have a Landscaping section. This section may discuss the types of shrubs and trees required / permitted. The minimum caliper of tree plantings may be defined in this section. The Landscaping section may discuss seeding rates for grassed areas, and other required ground cover.

  Sometimes the landscaping section will identify the minimum sizes of planting areas (end caps and "islands") within the parking field. There may be information requiring a certain frequency of shrubbery or trees to be planted within a required buffer specified elsewhere, and it may identify a number of trees that are required on site or within the parking lot based on the building size, lot size, or number of proposed parking spaces.

  Identifying the requirements and proposed landscaping compliance package charted on a landscaping plan is useful and often completed by a registered Landscape Architect (LA). Some jurisdictions may require the landscaping plan to be certified by the registered LA.

Figure F-12
(An Example of landscaping as installed around a "Monument" Sign)

- **Site Lighting** – The ordinance will usually have a lighting section. The lighting section will identify if there is a limitation to the height of light poles, if there is an average foot-candle (fc) level required in parking and other areas, and may limit the types of fixtures to cut off light from illuminating the sky. Lighting "pollution" has become a more significant concern to municipalities in recent years.

Zoning Summary

The zoning process and approvals related to zoning can be complicated. The above sections highlight many of the main topics that an engineer will be faced with when approaching a project that will require Land Development approval. Not every topic was reviewed above, and none of them were covered exhaustively. The engineer should always refer to the municipal specific zoning and land use ordinances when working on a project, thoroughly reviewing the definitions, zoning map, and all applicable sections. Most municipalities have people on staff that are there to answer questions, but since these interpretations can be subjective, it is a good idea to document all conversations in writing, and ultimately rely of the client's legal counsel as well.

E. Entitlements

Entitlements can be defined as the approvals required in order to entitle the owner / applicant to build on the property. There are many items that can be referred to as "Entitlements". As time passes, laws are created and entities/agencies are defined and created by the laws enacted in order to enforce those laws. Many entitlements fall into this category of a permit or approval from an authority having jurisdiction (AHJ) as required by law.

Another class of entitlement are related to the conveyance of property and other legal encumbrances that may have been placed on a piece of land. Due diligence investigation as discussed above should be pursued to confirm which if any entitlements will be required associated with any planned development.

A brief description and summary of many of the key entitlements that may be needed for a project are as follows:

State Requirements

The State entities govern many aspects of development, additionally many federal laws have been enacted, triggering requirements associated with land development that the burden of enforcement has also fallen on the states. Some that may be encountered are:

- **Department of Transportation (DOT) Approval** – If a property has frontage on a road or highway that is under the state DOT jurisdiction, there will typically be an application and approval process associated with maintaining and/or modifying the access to the site to and from the State Road.

  Different DOTs take jurisdiction of the approvals in distinct and nuanced ways. If stormwater runoff is directed toward the ROW, then they will want to review the drainage calculations, etc. Engaging the services of a Traffic Engineer and requesting a pre-application meeting with the State DOT representatives is always a good idea.

- **State Waters and Flood Plain** – As development has created more and more impervious coverage, the runoff of stormwater associated with rainfall events has

tended to negatively impact the frequency and volume of flooding. As a result, most states have been limiting development within the flood plain for some time.

Some states have a total moratorium over any "flood plain development", while others require mitigation and/or other accommodations be made for the safety of the public related to development in the flood plain. When performing due diligence on a site, it is a good idea to check the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) to see if there may be a flood plain on site. If there is, then it is appropriate to contact the state Department of Environmental Protection (DEP) / Department of Environmental Management (DEM) / Department of Environmental Conservation (DEC) to confirm the rules associated with flood plain development. Some larger cities have their own DEPs with their own set of requirements as well.

In addition to flood plain permits, any "blue line stream" as identified on a United States Geological Survey (USGS) Quadrangle Map may have a Riparian Buffer that will need to be maintained, and the state requirements for development near "open water" should be confirmed.

- **Wetlands** – If a property has wetlands on it then the appropriate approval will be needed. In some states, the state DEP handles Wetland Approvals, while in other locations, the US Army Corp. of Engineers or a local Wetlands Commission may be the Authority Having Jurisdiction over development near wetlands / in protected buffers.

  It may be helpful during due diligence to review United States Department of Agriculture (USDA) soils maps, which may have a rough delineation or otherwise at least provide an indication that protected wetlands may exist on site.

  In general, wetlands are identified by three (3) parameters based on:
  1. The topography/hydrology of the site,
  2. The condition / presence of hydric soils in the location, and
  3. The presence of "wetlands vegetation".

  While it is generally true that all three must be present in order for a protected wetland to exist, if the engineer suspects wetlands may be present on site they should advise the owner that a certified and trained wetlands delineator must be

engaged in order to formally confirm the presence/absence of wetlands. While no developer wants to find wetlands on a property under consideration, it is the engineer's ethical responsibility to inform the client of their opinions.

The presence or protected wetlands typically comes with a price. The limit of the wetlands will need to be defined on paper, and the buffers between development and protected wetlands are significant. Additionally, the approval process associated with development adjacent to wetlands can have an extended duration.

Figure F-13
(An Example of vegetation potentially indicative of "protected" wetlands on site)

- **Canal or other "protected lands" Commissions** – Often times there is another local or regional commission that may have jurisdiction over the project, for example if the site watershed flows stormwater runoff to a protected canal, there

may be a commission that will require application, submission and approval to complete the development. Or perhaps they will require visible screening or buffering of the site from their lands. The requirements of the Commission will need to be followed in the design of the site.

Figure F-14
(A picture of a canal that is under the jurisdiction of a "Canal Commission")

- **Other Miscellaneous Permits** – Depending on the location, proposed use, uses on-site, or existing state of the site, there may be other required permits such as:

    - Environmental Permits associated with Clean-up of Existing Contamination – Required if the site has known contamination, or contamination is encountered. This could be due to an underground tank removal, or a plume in the groundwater, or making sure an existing

previously mandated site cap remains intact or is restored related to capping the contamination in the post constructed condition.

- Asbestos Abatement Permit – Required if existing Asbestos Containing Materials (ACM's) must be removed from an existing building or location on site.

- Air Quality Permit for Generators – Required if emergency or stand-by generators will be proposed on site.

- Air Quality Permit for Dry Cleaning Equipment – Required if a dry cleaning use is proposed in a building

- Federal Aviation Administration (FAA) – Required if a proposed building will be placed within or near the flight path of a local airport. If there is an airport in the vicinity of a proposed development, contacting the FAA is highly recommended to obtain a determination letter.

- Non-State DOT Run Highway Authority – There are many Highway and Turnpike Authorities that may have approval rights if the proposed site is adjacent to the ROW of the agency. Even if access via the Highway Authority ROW is not requested or possible, they may still require review and approval of drainage or buffering/screening, etc.

- Railroad Agency – This may be required if a proposed site is adjacent to the Railroad ROW and drainage is directed toward the ROW. If there is a Railroad adjacent, or a Railroad ROW or Easement is encountered or found on the Survey, further investigation is warranted as the Railroad Agency/Authority may have an interest and/or jurisdictional authority related to the final site plan approval.

Figure F-15
(An Example of "abandoned" rail lines that might be indicative of an Easement on-site)

County Requirements

In some rural areas, The County is the authority having jurisdiction over zoning, whereby all zoning and site plan approval requirements are governed by the county. In other locations the county is merely an advisory body as relates to land development approvals, or they may only take interest if the county ROW is adjacent to the site.

As was noted, for states and locations where there is a network of "County roads", if a site is located on the County Road, the County may have a greater interest in the municipal site plan approval, and County approval may be a greater hurdle than might have otherwise been expected. In these cases, the County may take an interest in the drainage design, and/or it may impose County standards be met within the ROW associated with traffic, driveway aprons, street lighting, hardscapes, landscaping, and buffering.

Soil Erosion and Sediment Control Permits

The 1972 amendments to the Clean Water Act (CWA) established the National Pollutant Discharge Elimination System (NPDES) permit program. Over the decades that followed, the "Phases" of the program were implemented. As a result, most development is required to obtain a permit to discharge stormwater from the State's NPDES permitting authorities. The permit process enforces the water quality guidelines

and effluent limitation standards. Additionally, construction activities may require a permit application be filed. In some states the NPDES permitting authorities are the Department of Environmental Protection, in others it has been relegated to Soil Conservation Districts, or even in some cases the municipality's Soil Erosion Department.

In all cases, the intent is to minimize soil erosion and sediment runoff during construction as well the implementation of permeant soil erosion measures to limit erosion post-construction. The Soil Erosion Permit is a normally anticipated entitlement required for virtually all major development projects.

Figure F-16
(An Example of Soil Erosion measures (Silt Fence)
as required by the Soil Erosion Construction Permit)

Utility Providers

The normal course of due diligence will be to confirm how utilities will be provided to a site. A normal first step for an engineer to complete is requesting "will serve" letters from the various utility companies as well as supporting the application process for services. Many times there are existing or required utility company easements required associated with the site plan approval process. Easements will be discussed in further detail later. The following also summarizes utility entitlements at a high level:

- **Electrical** – Electric utility companies have had their territories assigned by a process that has taken decades to unfold. If someone desires electric service within that utility company's jurisdiction, there may be a cost associated with having the service brought to the site. The electric company should be contacted to confirm availability of the service needed at the capacity and voltages desired, to obtain any standard details that will be required associated with private construction (i.e. transformer and switchgear pad details, trench details), and to confirm the anticipated delineation of scope between the developer's responsibilities and what the electric company will construct. If the utility has an easement on site, they may impose certain requirements on the development as can be seen on Figure F-17.

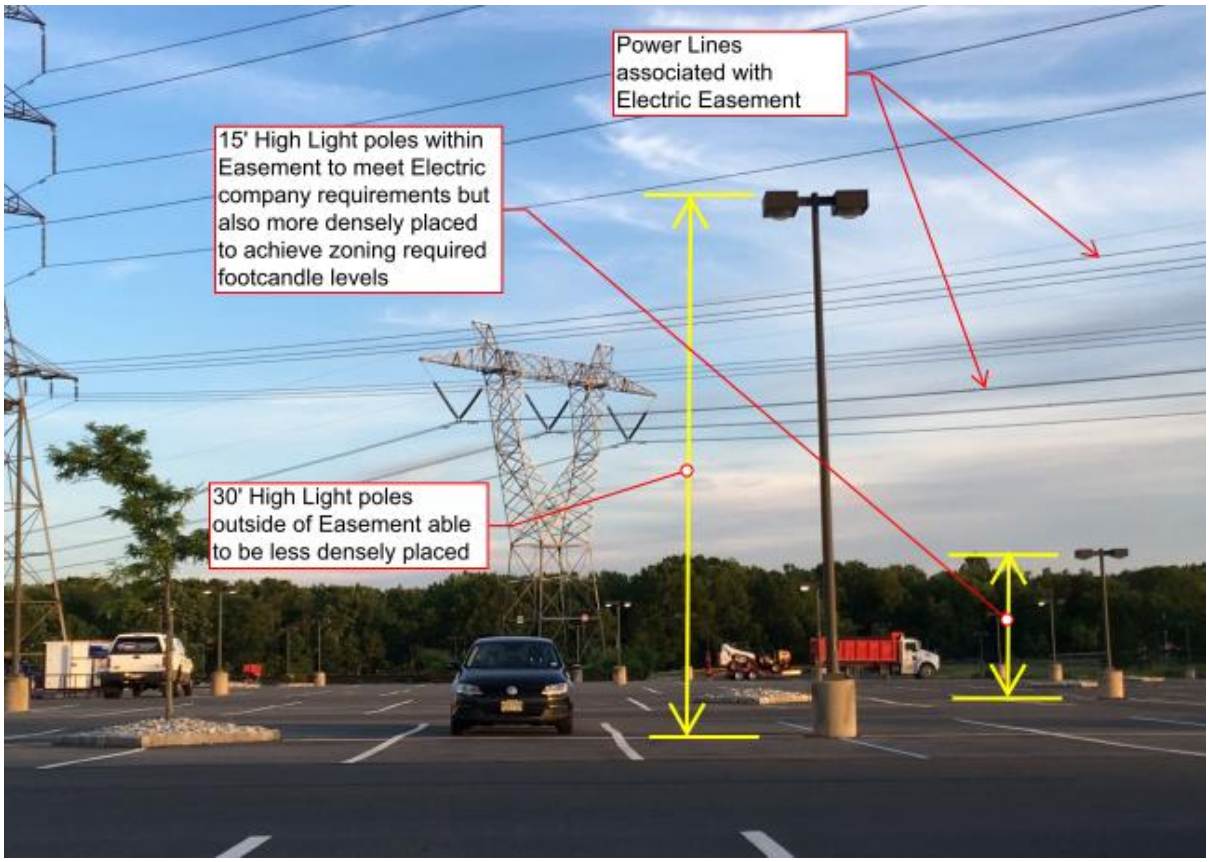

Figure F-17
(An Example of an Electrical Easement and the resulting / imposed light pole height limitation based on the Electric Company's review authority over the proposed development within the Easement (note: 2 pole heights on-site))

- **Gas** – If gas service is desired and available, the gas company should be contacted to confirm availability of the service needed at the capacity desired. Many time there are gas transmission easements that will cross the property in questions. Relocation of existing transmission lines is feasible, but costly.

- **Water** – If public water service is desired and available, the water company should be contacted to confirm availability of the service. Perhaps public water is available, but not at the needed pressure and flow rate. In these cases on-site storage of water in tanks, or supplemental pumps may be required. The water provider may be a "private" water company, or a municipal or city water

department. There will be nuances in the application process to obtain water service.

In many cases public water will not be currently available, in which case the developer must explore the feasibility and cost of having the water provider extend water to the site at a cost to the owner. In some cases, even extending water is not an option (or is considered cost prohibitive), in which case investigation to confirm the feasibility and costs of well drilling to provide the water needed for the site may be explored.

- **Sewer** – If public sewer service is available on site, the local sewer authority should be contacted to confirm connection requirements. Often the local municipal Sewer Department handles applications associated connection to the system (as they are responsible to maintain the sewer conveyance systems), but a local or regional Sewer Authority also has jurisdiction, handling applications and approvals associated with treatment of the sewerage. As a result, it is always recommended during the due diligence process, that the question be asked, "Does the applicant require approval from just this department, or is there another agency or authority that will also have jurisdiction over conveyance and/or treatment of the sewerage". This will be very helpful in the process and can save a lot of headaches near the end of a project. Often a pumping station must be designed and constructed based on the distance and/or topography of the required extension. If an extension is required, many times the State will have jurisdictional review of an application, and the State permit / approval will be required in order for the Sewer Authority to provide their approval.

  Often it is cost prohibitive, or not even an option to extend the sewer to tie the site in to the public system, in which case an on-site disposal (septic) system and/or (in the case of a large retail facility) private treatment plant might be required.

  In addition to the above, it is worth noting that in the case of a residential subdivision outside of the public sewer feasibility area, confirming that the soils on-site are conducive to allow for a properly functioning septic system on every lot is a wise item to investigate during the due diligence process. There have been fully approved subdivisions (approved by the appropriate board at the municipal level), that could not be fully memorialized and had to be withdrawn

due to the applicant's inability to comply with the "provide an approved septic system design" condition / requirement of the approval. This may be rare, but can be an embarrassing situation after all the time, effort and cost that went into the municipal approval.

While not necessarily difficult to obtain in most cases, the utility approvals and endorsements are an important entitlement to not overlook.

Easement and Title issues

When approaching a site planning exercise it is important to review the Title and Survey for easements and/or other encumbrances. An easement is defined as "the right to cross or otherwise use someone else's land for a specified purpose." Many easements were entered into by two adjoining property owners for a mutually beneficial cause. Others were established on the basis of eminent domain. Regardless of why an easement exists, it may impact the ability of the current developer to fully utilize the property as they intend. As a result, this is an important aspect of the due diligence process.

An ALTA/ACSM or ALTA/NSPS (respectively: (American Land Title Association), (American Congress on Surveying and Mapping), & (National Society of Professional Surveyors)) Survey is a document prepared by a Licensed Surveyor incorporating among other things, the information from a Title Insurance Report. While this is typically a thorough review, sometimes there are little nuances in the language of an item on the Title Report that requires a second review by the client's attorney.

More often than not the owner does not involve the engineer in review of the Title Report, however it is recommended.

Some examples of Title and/or Easement issues that could impact development are as follows:

- A utility easement cutting through the proposed footprint of the new building footprint that the surveyor was not aware of due to the client merely ordering a Boundary and Topographic Survey or even just a Topographic Survey in lieu of ordering an ALTA Survey.
- A deed identifying that a former owner deeded a portion of the property to be used "into perpetuity for the benefit of the community".
- A cross access easement granting the owner of the adjacent land locked lot, access rights to the public ROW via the owner's site.

All of these have an implication, and if the design team is not aware of them they may pursue layout strategies that do not make accommodations for the easement. If the items are not addressed at the appropriate time they may rear their ugly head at an extremely inopportune time such as at the Board hearing.

In general, many easements can be vacated if they are no longer in use, but the legal team need to be aware of these items if they are to take the appropriate steps. Often, the engineer is the only player knowledgeable enough to guide the owner in performing the due diligence required to protect themselves from these potential liabilities.

F. Final Approval and other Construction Related Entitlements

In general, Site Plan approval will require a Board hearing where the Application will be reviewed and discussed, and if required, variances and waivers must be justified in a public forum where notice has been given to adjoining property owners and the general public. At the hearing, the applicant's legal counsel presents the application by calling and questioning the expert witnesses which may include the Architect, a Professional Planner (especially in cases requiring a Use Variance), the Site Civil Engineer, a Traffic Consulting Engineer, and others as needed. In most jurisdictions, in order for the experts to testify they must be licensed professionals. If the Board approves the application at the hearing, there are still a few other steps / entitlements that will be required in order to break ground and ultimately occupy any proposed buildings.

The following is a summary of some other "entitlements" that may be required for the Owner/Applicant to fully realize the intended use of the site as planned and anticipated:

- **Memorialization of the Board Resolution** - In many jurisdictions, once Site Plan Approval is granted by the appropriate Board, a Resolution is drafted documenting the approval and any variances (including Use Variances if applicable) that were granted. Typically, the Resolution will also identify several conditions, clauses, or requirements that must be put into place in order for the Resolution to be binding. This is also often where other required outside entitlement are identified.

  Then at the next regular meeting of the Board, the Resolution that was drafted in response to the granted approval is given a "second reading" and is "Memorialized" with a second vote, confirming the details of the Resolution are accurate and is now binding. At this point, if the municipal engineer agrees, ground breaking of the site work may proceed.

- **Engineering Sign-off** - Once the Board Resolution is memorialized, the applicant typically has to work with the Board Engineer to show compliance with any conditions of the resolution, which might even involve some minor changes to the Site Plans based on conditions that had come up at the Board Hearing. Some items that might be required are the creating a construction estimate for bonding purposes, posting of construction bonds, and/or filing of a soil moving

permit. Once the engineer is satisfied they typically draft a letter of compliance that may be issued to the Zoning Officer.

- **Soil Moving Permit** - In some jurisdictions, once the Resolution is memorialized, a Soil Moving Permit must be obtained in order for site work construction to actually take place. If a jurisdiction requires this type of permit, it is typically easily obtained by completing a very simple application form and paying a small fee. This Permit would not be granted without the Resolution and/or Engineering sign-off.

- **Zoning Certificate and Building Permit** - In some jurisdictions, once all other zoning and entitlements have been obtained, and the Resolution is memorialized, the Zoning Officer will issue a Zoning Certificate to the applicant and Building Department so that the Building Official has documentation that their department may start reviewing building plans for compliance with the code. The final step to a raw land development is obtaining the Building Permits for any proposed buildings on-site.

  In this step, if all AHJ approvals associated with site plan approval have been received, the applicant is in a position to apply for the Building Permit with the Architect's building plans. The Architectural plans must be prepared compliant with the applicable Building Code (as well as Mechanical-Electrical-Plumbing (MEP) plans being compliant with the respective sub-codes (i.e. Building, HVAC/Mechanical, Electrical, Plumbing, and Fire). These are submitted with a Building Permit application and the appropriate fees typically by the Licensed General Contractor hired for the job. Additionally, each trade contractor must apply for a permit associated with the appropriate sub-code.

  Some rural municipal jurisdictions are very small and do not have qualified individuals on staff to review plans for compliance with building codes. In these cases, the County or State may have been requested to provide and/or have taken jurisdiction over the issuance of building permits.

  The review team may have comments associated with changes or clarifications. Once they find the plans to be compliant, a Building Permit is issued.

- **Inspections and Certificate of Occupancy** - As the construction process occurs there will be certain milestones of construction that require inspection by municipal inspectors related to the various sub-codes. When the final inspection of each sub-code has been completed and the work accepted but the inspector, the Building Department will issue a Certificate of Occupancy. Often times in order to allow the occupant to start occupying the facility while some minor punch list items are still being completed the team may request a Partial or Temporary Certificate of Occupancy. While there are nuances in how every municipality enforces these items, until the final Certificate of Occupancy is obtained the building project should not be considered closed or complete.

  In addition to municipal inspections, building projects often have special inspections required for example by the structural engineer to confirm certain structural details have been complied with.

  Some jurisdictions are also now requiring civil engineers to perform special inspections during site work construction associated with review of the installation of various stormwater features and drainage Best Management Practices (BMP's).

G. Summary and Conclusion

This course has presented basic concepts of zoning and entitlements. Those who complete this course should have a better understanding of zoning and entitlements and this course can be used to help guide the investigation process required to perform quality due diligence. Every jurisdiction has distinctions, and not all entitlements can or have been covered in a course of this nature. However, the diligent engineer will be able to use this course in conjunction with the experience they have gained (and may also glean from senior team members in their firm) to guide their clients to more and more frequently successful projects with less and less surprises.

