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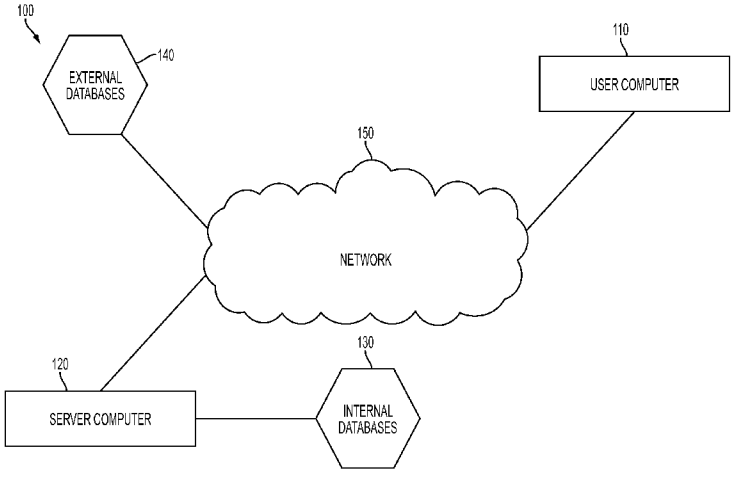

FIG. 1

(57) Abstract: A system, a method and a computer program, including an online application software, that enable any user to input the address of a property site at any geographical location worldwide, where the user desires to erect a new building. The system includes a plurality of modules, including modules for residential, commercial and civic buildings in all community types, and through a series of steps guides a user along the process of assessing and determining the allowed buildable envelope, selecting desired building type, building program, construction system, architectural style, and level of environmental responsiveness, as well as intended construction budget. The system analyzes these data and produces building designs that comply with all local, state/provincial and federal/national applicable codes and regulations, embody a rigorous set of architectural, engineering and construction best practices and know-how, related to the specifics of the project, and best respond to the site constraints and user criteria.

A SYSTEM AND A METHOD FOR DESIGNING BUILDINGS

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CROSS REFERENCE TO PRIOR APPLICATIONS

[0002] This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Patent Application No. 61/793,647, filed March 15, 2013, titled "SYSTEM AND A METHOD FOR DESIGNING BUILDINGS," the disclosure of which is hereby expressly incorporated herein by reference in its entirety.

FIELD OF THE DISCLOSURE

[0003] The present disclosure relates to a system, a method, and a computer program for providing building designs that comply with all applicable codes and regulations, embody a rigorous set of architectural, engineering and construction best practices and multidisciplinary know-how, are related to the specifics of a project, and best respond to the project site constraints and user criteria.

BACKGROUND OF THE DISCLOSURE

[0004] As of 2008, more than half of the world population lives in urban areas, and their exponential growth poses increasing environmental, social, and economic challenges in many ways related to place making, compounded by ongoing unsustainable patterns of building design, construction and use.

[0005] The last 65 years have witnessed a continuous rise of Sprawl, first started as an exclusively American phenomenon, yet quickly spread throughout the developed and developing world. The massive economies of scale, a penchant for standardization and one-size-fits-all solutions favored by the financial and construction industries, abandonment of traditional wisdom, segregation of land uses, high costs of overdesigned and stretched infrastructure, almost exclusive reliance on energy-intensive systems for human comfort and car-centric mobility, and the disjunction between the private and public realms have brought about the greatest misallocation of capital in human history, evidenced by the loss of agricultural land to a myriad subdivisions and developments, brimming with underperforming, monotonous, aesthetically underwhelming building monocultures, void of the balanced type and use mix found in successful urban settlements. The environmental, economic, social and cultural folly of such practices has been progressively realized over the past three decades, yet never more so than after the Great Recession, and its epic collapse of an American housing market oversaturated with large-tract single-family houses.

[0006] Along the way, the architectural profession has saddled the poor with design experimentation, and forced the middle class to choose among mostly bad options, imposed through a skewed free market, as less talented professionals endeavor the highly personal styles of Modern Masters, or the classically inspired ones of Traditionalists, which demand an education and sensibility most practitioners currently lack, thus failing on both accounts. Only the upper class can afford to seek excellence in design, by engaging the very best architects.

[0007] The design of new walkable communities, retrofitting of Sprawl, infill revitalization of decaying urban areas, and natural renovation of building stock in existing towns and cities under the dictate of different economic realities, growing demographic pressures and Climate Change, demand new building designs, tailored to a wide range of locale-specific determinants, which can be delivered quickly, affordably, and in a significant quantity to make a difference.

[0008] Up until now, arriving at a final set of Construction Documents and Cost Estimate, for any given building, has implied a rather lengthy interaction among users, be it owners, developers or builders, and their architects and engineers, stretching anywhere between a few weeks to several years, one project at a time. This process needs to be made more efficient.

SUMMARY OF THE DISCLOSURE

[0009] According to some aspects of the disclosure, a computer-implemented method for generating building designs is provided. The method may include collecting by a computer building design data including building specific data and site specific data; generating by the computer at least one building design candidate compatible with the collected building design data; and upon approval of one of said at least one building design candidates, generating by the computer a final set of construction design documents for at least one approved building design candidate.

[0010] According to some aspects of the disclosure, the building specific data may comprise one or more of a building type, an architecture type, and an environmental standard. The site specific data may comprises one or more of a site address, zoning description, legal description, and a physical description of the site.

[0011] In accordance with aspects of the disclosure, collecting the building design data may comprise gathering by the computer the site specific data; presenting by the computer a selection of building types compatible with the site specific data; upon receipt of a selection of a building type by the computer, presenting a selections of spaces to be included in the building; and determining by the computer a construction system based on the site specific data and the selecting building type. The method may further include presenting a selection of environmental standards.

[0012] In accordance with aspects of the invention, generating at least one building design candidate may include generating an array of variables that define a building design based on the building design data.

[0013] According to some aspects of the disclosure, the at least one building design candidate comprises one or more of diagrams, pictures, video, and written narrative, the building design candidate describing characteristics of the building and a preliminary cost estimate. The final set of construction design documents for the at least one approved building design comprises working drawings, specifications, and a final cost estimate.

[0014] In accordance with aspects of the disclosure, collecting the building design data comprises retrieving data from one or more internal or external databases.

[0015] In accordance with some aspects of the disclosure, the method may further include presenting a graphical rendering of the at least one building design candidate. The graphical rendering comprises a virtual tour of the at least one building design. The graphical rendering may illustrate the at least one design candidate within in the context of the surrounding neighborhood.

[0016] According to some aspects of the disclosure, site specific data may comprise zoning data, and wherein collecting the site specific data comprises searching a database for a zoning ordinance applicable to the site, wherein when a zoning ordinance cannot be located, a zoning questionnaire is presented to a user to obtain zoning information.

[0017] In accordance with some aspects of the disclosure generating the at least one building design candidate may comprise searching at least one database of building designs for one or more building design candidates compatible with the building design data. For each building design candidate, an estimated construction cost may be computed.

[0018] According to some aspects of the disclosure, the method may also include receiving a request to edit at least one component of the design after presenting the graphical rendering; and generating a new graphical rendering reflecting the requested edit. The graphical rendering illustrates the at least one design candidate within the context of the surrounding neighborhood.

[0019] According to some aspects of the disclosure, a building design system for generating building designs is provided. The system may include a building design data collector unit that collects building design data including building specific data and site specific data; a building design determiner unit that identifies at least one building design candidate compatible with the collected building design data; and a building design generator unit that, upon approval of one of said at least one building design candidates by the building design determiner, generates a final set of construction design documents for the at least one approved building design candidate.

[0020] The building design collector may be configured to gather site specific data; present a selection of building types compatible with the site specific data; upon receipt of a selection of a building type, present a selections of spaces to be included in the building; and determine a construction system based on the site specific data and the selected building type. The system may also include an environmental standards presenter unit that presents a selection of environmental standards.

[0021] Additional features, advantages, and embodiments of the disclosure may be set forth or apparent from consideration of the detailed description, drawings and attachment. Moreover, it is to be understood that the foregoing summary of the disclosure and the following detailed description, drawings and attachment are exemplary and intended to provide further explanation without limiting the scope of the disclosure as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS AND APPENDICES

[0022] The accompanying drawings, which are included to provide a further understanding of the disclosure, are incorporated in and constitute a part of this specification, illustrate embodiments of the disclosure and together with the detailed description and attachment serve to explain the principles of the disclosure. No attempt is made to show structural details of the disclosure in more detail than may be necessary for a fundamental understanding of the disclosure and the various ways in which it may be practiced. In the drawings:

[0023] FIG. 1 shows a high-level diagram describing an example of a system according to the principles of the disclosure;

[0024] FIG. 2 shows an example of a suite of workflow components, according to an embodiment of the disclosure

[0025] FIG. 3 shows a flow diagram summarizing and illustrating a building design selection method, according to the principles of the disclosure;

[0026] FIGS. 4A – 4E show further details of the method shown in FIG. 3; and

[0027] FIGS. 5A – 5G show detailed views of portions of a buildable envelope determination process;

[0028] Appendices A-C show examples of a Zoning questionnaire, Site questionnaire and Context questionnaire, respectively, illustrating metrics, analysis and logic associated with the building design selection method, according to the principles of the disclosure; and

[0029] Appendix D shows an example of a set of formulae and tables used to process information that may be implemented in the building design selection method.

[0030] The present disclosure is further described in the detailed description that follows.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0031] The disclosure and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments and examples that are described and/or illustrated in the accompanying drawings and detailed in the following description. It should be noted that the features illustrated in the drawings are not necessarily drawn to scale, and features of one embodiment may be employed with other embodiments, as the skilled artisan would recognize, even if not explicitly stated

herein. Descriptions of well-known components and processing techniques may be omitted so as to not unnecessarily obscure the embodiments of the disclosure. The examples used herein are intended merely to facilitate an understanding of ways in which the disclosure may be practiced and to further enable those of skill in the art to practice the embodiments of the disclosure. Accordingly, the examples and embodiments herein should not be construed as limiting the scope of the disclosure. Moreover, it is noted that like reference numerals represent similar parts throughout the several views of the drawings.

[0032] **FIG. 1** shows an example of a system **100**, which is constructed according to the principles of the disclosure. The system **100** includes a computer (or user computer) **110**, a server (or server computer) **120**, and a network **150**. The system **100** may include an internal database **130** and/or an external database **140**. The databases **130/140** may be located at or in the server **120**, or remotely from the server. The system **100** may be interconnected through one or more communication links. In the system **100**, at least one user, and at least one server, may communicate with at least one integrated analysis and design environment that can reside, in part or in full, in the network **150**, which may include a cloud application, the user computer **110**, the server **120**, or any combination thereof. The cloud application may collect information from the user via the user's computer interface, and pull data from either internal database(s) **130** residing in at least one server, external database(s) **140**, or any combination thereof, which may then be processed, analyzed, arranged and customized to produce a final output.

[0033] **FIG. 2** shows an example of a suite of workflow components, according to an embodiment of the disclosure. The high-level block diagram illustrated in **FIG. 2**

illustrates interrelated applications and modules within the system online software platform. The suite of workflow components may include, for example, a system platform **200** and a suite of applications or modules, including, e.g., a residential module **210**, a commercial module **220**, a civic module **230**, a real estate and value calculator module **240**, a construction financing module **250**, and the like. The system platform **200** and the modules **210 – 250** may reside in the network **150** (shown in **FIG. 1**), which may include a computer cloud, or the server **120**, and/or the user computer **110**. The suite of workflow components may further include an interface to communicate with the system members' community **260**, an allied professional network **270**, and allied partner companies **280**.

[0034] **FIG. 3** shows an example of a building design selection method, according to an embodiment of the disclosure. Phase I **300** of the method comprises obtaining, determining, and/or collecting all data necessary to select building designs. At **302**, information is gathered about any specific building site, including its address, zoning data, legal and physical descriptions, and relevant context. At **304**, the user is requested to select the desired building type, out of a limited range resulting from the analysis of site data. At **306**, the building program is defined, including quantitative and qualitative parameters, as well as functional relations. At **308**, the construction system to be used is defined, out of those options determined by a logic analysis automatically performed on site data. These options are also compatible with and optimized for the building type selected. At **310**, the fundamental decision of architectural style is made between Modern versus Traditional, as allowed by the architectural regulations in place, and further defined. At **312**, the desired level of environmental response is selected, with a default

option offered as the most basic, also built into all other ones. Increasing levels of compliance characterize subsequent options, comparable with the USGBC Silver, Gold and Platinum LEED certification levels. At **314**, automatic analysis of all metrics obtained or determined at steps **302**, **304**, **306**, **308**, **310** and **312** is performed to produce a specific array of variables, used next to select building designs and generate a population within the system. It should be noted that some metrics associated with any given building site can be derived directly from the input data, while other metrics are derived from simulated or calculated results, or from interior or exterior databases, the search of which is triggered by data input. At **316** the expected construction budget is obtained.

[0035] Phase II **320** starts at **322**, where the building designs population is organized in an array, according to overall compatibility with the metrics obtained or determined at steps **302**, **304**, **306**, **308**, **310**, **312** and **316**. At **324**, the building designs are unveiled, as portrayed on the user interface by visual communication devices, such as plans, diagrams, pictures and/or video, written communication in the form of a plain language narrative, and tabular information; thus describing the design intent, preliminary cost estimate, and other relevant characteristics of the building designs. Comparison of all building designs unveiled can take place at this point, as well as final selection of the desired one.

[0036] Phase III **330** allows the user to confirm the suggested selection of building materials, products and finishes generated for the finally chosen building design, or otherwise customize them **332**. At the end **340** a complete set of construction documents

including, but not limited to, working drawings and specifications, and a final construction cost estimate, are generated.

[0037] Referring now to **FIGS. 4A** through **4E**, a more detailed description of a succession of steps through which the system may direct a user, allow data input, and trigger actions, some of which may be rather complex, that later change subsequent items in the workflow is provided. The workflow step items are meant to provide immediate and direct guidance to the user, e.g., as part of the interface, supplying illustrated definitions and support metrics as necessary, and directly linking to specific databases and help resources. Workflow item completion can unlock later actions for use, which can be carried out sequentially and/or in parallel, requesting, processing or providing information. By having the user submit a valid e-mail address at the beginning of the workflow, the user session provides the capability to track all workflow items, and allow the user to stop and retake the building design selection process at any point within the workflow, in case the user might need to collect some requested information for input, or further ponder any decision. At the end of the workflow navigation the expected result is generated, with the stated benefits.

[0038] In **FIGS. 4A – 4E**, the workflow navigator starts **401** by, e.g., requiring the user to register through a valid e-mail address, and then requesting the full address **402** for the site where the user desires to erect a building, including city or town name, as well as that of the state, province or department, and the zip or postal code. This triggers Step 1 of Phase I, where all relevant site information is gathered. According to the preferred embodiment, the system searches **403** within a zoning database **404** for the specific zoning ordinance enforced at the site location. In accordance with some aspects of the

disclosure, the zoning database **404** may be an internal database storing known zoning ordinances for one or more jurisdictions. In other aspects, the zoning database **404** may include one or more external databases accessible over a communication network. Once an appropriate zoning ordinance is determined, confirmation of the zoning ordinance may be requested from the user **405**. After a correct match the system also searches for the Zoning District/Transect Zone **406** by pairing the address with the Zoning District/Transect Zone labeling of each property, within the local Tax Folio, Zoning Map, Regulating Plan and/or other database(s) **407**. Confirmation of a correct Zoning District/Transect Zone identification **408** allows the system to pull out all the necessary standards and parameters regulating density, intensity and all other zoning constraints **409** for the site.

[0039] If the Zoning Ordinance identified at **403** is deemed incorrect by the user at **405**, or if no match is found at **403**, then the System allows the user to carry a name search **410** within zoning database **404**, which could overcome a small name difference behind the unsuccessful attempt at identifying the corresponding Zoning Ordinance. If the Zoning District/Transect Zone identification at **408** is incorrect or yields no result, the System allows the user to input the name of the Zoning District/Transect Zone manually, triggering a name search **411** within the internal Zoning Database **404**.

[0040] If name searches **410**, **411** still yield no correct identification for the Zoning Ordinance and Zoning District/Transect Zone, the system assists the user to fill in the zoning questionnaire **412**, thus obtaining zoning constraints **409** for the Site.

[0041] The system pulls the legal Description corresponding to the Site address by searching **413** within the local Tax Folio, Zoning Map, Regulating Plan and/or other

database(s) **407**. If no match is achieved, then the user is directed to input the legal description manually **414**. The legal description **415** defines the site location and boundaries, may be included in working drawings, and allows for a graphic rendition of the site if necessary.

[0042] According to some aspects of the disclosure, the system pulls the corresponding property lines, topography, geotechnical data, and other relevant multilayered information **416** from local/national GIS mapping database(s) **417**, by using the site address. An exact rendition of the site is thus graphically generated **418**, the topography of which is checked against a topographical database **419**. The system then assists the user to fill in the site questionnaire **420**, which allows for confirmation and further input of geographical data and other relevant physical information, thus arriving to a detailed summary of the site physical description/constraints **421**.

[0043] If GIS mapping is not available for the site location, the system may query the user to upload a scan of the property survey for the site, and input specific information from, for example, a Certificate of Elevation and/or the geotechnical report **422**. The system then applies computer vision capabilities to process and interpret the scanned image, which together with the legal description **415** allows for an exact rendition of the site to be graphically generated **418**, the topography of which is obtained from the topographical database **419**. The user is thereon directed to the site questionnaire **420**, and ultimately to a detailed summary of the site physical description/constraints **421**.

[0044] If the user has a property survey hardcopy, but no scanning capabilities, the system can assist the user to manually input the metes and bounds **423** for the site, if applicable, which together with the legal description **415** allows for an exact rendition of

the site to be graphically generated **418**, the topography of which is obtained from the topographical database **419**. The user is thereon directed to the site questionnaire **420**, and ultimately to a detailed summary of the site physical description/constraints **421**.

[0045] If the user has no property survey whatsoever, the system may direct him to those land surveyors who are members of the system's Allied Professional Network **425**, therefore vetted as acknowledged, trustworthy professionals, and available in the area, who the user could approach to get a property survey and Elevation Certificate from **424**.

[0046] The system searches for relevant context information **426** within the internal Context Database **427** and local/national GIS mapping database(s) **417**. The user is then assisted to fill the site context questionnaire **428**, to confirm/retrieve all information pertaining to the immediate neighboring properties to the site, as well as the surrounding urban patterns and other related data, thus performing a detailed context analysis **429**.

[0047] The determined zoning constraints **409**, legal description **415**, rendered site with physical description/constraints **421**, and context analysis **429** are processed, mashed up, and modeled to provide the buildable envelope **430** for the site, where all those criteria and metrics are embodied. This ends Step 1 of Phase I.

[0048] In Step 2 of Phase I the system's workflow navigator directs the user to select a building type. The system may automatically search for those basic (primary) building types that are allowed within the corresponding Zoning District/Transect Zone, presenting them to the user for selection **431**, along with a brief written and graphically illustrated definition for each, to better inform the decision. The selection process may be taken one step further as the system identifies the specific (secondary) building types within the previously selected basic (primary) building type category, which are

compatible with the local cultural building tradition, and geared to deal with the local climate and social trends and customs in the most successful manner, thus presenting them to the user for selection **432**, along with a brief written and graphically illustrated definition for each, to better inform the decision. As a result, a very concrete, locally tailored building type **433** may be selected for the project.

[0049] In Step 3 of Phase I the system's workflow navigator may direct the user to select rooms/spaces **434** to be included in the building program. Quantitative **435** and Qualitative **436** choices are available. Quantitative options offered to the user deal with parametric variables, to be fixed at a given value; e.g., in the residential module, the system requests the user to choose the desired number of bedrooms, baths, etc. Qualitative options offered to the user include other rooms/spaces that bring value not by the number, but by its mere inclusion or exclusion, e.g. a swimming Pool. Rooms/Spaces grouping **437** allows the user to choose among specific space arrangements and adjacencies offered, which make sense given the quantitative and qualitative choices just made. The system presents the user with major appliance and fixture categories **438** for selection, so they and their count can be included in the planning of functional areas (though specific product selections take place in Phase III), and with a list of verbalized subjective values to choose from **439** e.g. well-lit, solid, airy, open-concept, which are household terms in the real estate and design worlds, and that once selected bring forward specific building designs which also embody most or all of those values. The quantitative **435** and qualitative choices **436**, room/space grouping **437**, major appliance/fixtures categories selection and count **438**, and subjective values selection **439** metrics are then summarized by the system in the building program **440**.

[0050] In Step 4 of Phase I the system's workflow navigator determines and presents the user with different choices of locally feasible and most commonly used building systems for selection **441**. Each one of the presented options is accompanied by a locally calibrated approximate index of cost construction per area unit, put together with information pulled out from local/national construction costs database(s) **442**, as well as a brief written and graphically illustrated definition, with the building system pros and cons, to better inform the decision. Locally fitting proprietary systems belonging to Allied Partner Companies **443** are also featured as possible options. Building system options can be overridden by the user, searching for options other than those optimal ones initially brought forward by the system's workflow navigator. Using the geotechnical/soil information requested/determined as part of the site physical description/constraints 421, the system recommends foundation systems which are safe, compatible with the just chosen building system, and locally feasible, presenting them to the user for confirmation/selection **444**, along with a brief written and graphically illustrated definition for each, and a locally calibrated approximate index of cost construction per area unit, put together with information pulled out from local/national Construction Costs and Allied Partner Companies database(s) **442**, **443**, to better inform the decision. A specific construction system **445** is thus determined for the project.

[0051] In Step 5 of Phase I the system's workflow navigator requests selection of architectural style **446**, as allowed by the zoning ordinance in place, including architectural standards. As a brief audiovisual/written/graphic conceptual introduction is generated, the fundamental choice between modern **447** and traditional **448** architectural styles may be explained, and locally relevant examples of both illustrated. If the

traditional option is selected, the system may identify whether very defined and strong stylistic precedents characterize the local building culture, by searching within its internal traditional styles database **449**, and may request the user to choose among fitting historical building styles that are still or should be part of the local living building tradition **450**. All traditional building designs are gauged along the Classical/Vernacular spectrum, and allocated accordingly. The architectural style is determined for the Building **451**.

[0052] In Step 6 of Phase I the system's workflow navigator presents choices for the level of environmental response **452** the user desires to accomplish for the building design. The Original Green **453** is the most basic, yet the most significant. It aims to achieve buildings that can engage the community, be capable of playing a role in the production of food and water for their occupants, be accessible, appropriate to its location and cultural heritage, flexible, durable, frugal and responsive to the local climate by default, through the use of time-tested traditional techniques. This level is also present as the minimum required for the materials and products placed in the Architect's Choice material, product or finish selection suggested for the Specifications, in Step 1 of Phase III. Silver Green **454**, Gold Green **455**, and Platinum Green **456** have the Original Green **453** level requirements embodied. In addition to them, they also include several possible combinations of design features that, when checked against the USGBC LEED Certification checklist(s), account for the comparable number of certification points required for corresponding LEED Certification levels. By including any of those combinations of design features, the selected level of Environmental Response makes the Building Design LEED-certifiable. In all cases, the most important implications of each

level selection are explained through a brief written and graphically illustrated definition, along with comparative metrics, to better inform the decision. A conscious selection of the desired level of environmental response **457** for the project is therefore made.

[0053] At this point the system's workflow navigator may perform a thorough analysis of the buildable envelope **430**, building type **433**, building program **440**, construction system **445**, architectural style **451**, and level of environmental response **457** metrics, create a specific array of variables, searche within its internal building designs database **459** for those building designs that match said variables with varying degrees of compatibility, within a permissible range, and generate a finite population of building designs with preliminary construction cost estimates **458.** The population may be divided into ranges according to their construction cost.

[0054] If by any chance the population of building designs with preliminary construction cost estimates cannot be generated **458**, due to building program **440** requirements which do not physically fit within the buildable envelope **430** of the site, the system's workflow directs user to jump backwards in the workflow to Step 3 of Phase I, and come up with a more modest building program **440**, which could then be used to generate a valid population of building designs with preliminary construction cost estimates **458**.

[0055] In Step 7 of Phase I the system's workflow navigator may prompt the user to provide a construction budget for the project **460**, after providing the user with a brief audiovisual/written/graphic introduction explaining construction costs, how they fit within the larger project budget, and what other expenses are applicable and reasonable to expect. If the user already has a construction budget in mind, there is an option where

said figure can be input directly **461**, and then allocated within the corresponding construction cost range **462**, out of those into which the building designs population has been divided. If, on the contrary, the user has no budget set yet, there is another option where the system presents the building design population's construction cost ranges to choose from **463**. In either option, the resulting selection determines the desired construction budget **464**.

[0056] If the construction budget figure entered by the user in the first scenario is lower than the presented construction cost ranges within the building designs population, or if those are deemed too high by the user, when confronted with them for selection under the second scenario, the system's workflow navigator presents the user with path options **465**: move forward to Step 1 of Phase II, and unveil building designs for evaluation and selection regardless, in which case the lower construction cost range would be selected by default; go back and input/select a higher construction budget/range; or otherwise jump backwards in the workflow and modify metrics that affect costs, following specific construction cost-reducing suggestions by the system; thus triggering the generation of a new population of building designs with lower preliminary construction cost estimates **458**, which may then be divided again into ranges according to their construction cost.

[0057] After identifying the targeted construction budget **464**, the system's algorithm adds this metric to all other ones used to generate the building designs population **458**, and proceeds to filter, discriminate and arrange building designs, with their preliminary construction estimates, according to relevance **466**.

[0058] In Step 1 of Phase II, the system's workflow navigator unveils proposed building designs **467**, retrieving, for example, the three single-most relevant ones out of the population. Each building design is displayed on the user interface by means of visual communication devices, plain language narrative, and tabular information including, but not limited to, a 3D animation and/or artistic rendering(s), presentation site and floor plan(s), preliminary construction cost estimate, design intent narrative, spatial parameters summary, LEED-"certifiability" level, approximate energy cost projections, and search relevance Index. The user can either retrieve the rest of the diminishingly relevant building designs out of the population for evaluation, for example, in groups of three **468**, and single out any combination of building designs for simultaneous comparison **469**, prior to making a final building design selection **470**, or jump forward in the workflow and make a final building design selection **470** out of the three first building design options. The system's workflow navigator then presents the user with small spatial variables for selection **471**, in those building designs where they are available.

[0059] If the user decides to make changes to the variables determined in Steps 2 through 7 of Phase I, after evaluating the building designs, the system's workflow allows the user to jump backwards at will **472**, while also keeping one or more of the building designs originally unveiled, for further comparison, and confirm or modify all other determined metrics, which would then be analyzed and generate a new population of building designs to choose from, with preliminary construction cost estimates.

[0060] After the Final Building Design selection, the system's workflow directs the user to Step 1 of Phase III, where the preliminary selection of all building materials,

products and finishes involved is confirmed or modified **473**; thus effectively customizing the set of specifications to be included in the construction documents.

[0061] According to the preferred embodiment, the user may take a virtual tour of the finally selected building design. As the user moves through virtual rooms and spaces, all relevant categories of construction materials, products and finishes are sequentially brought up for selection, and the available options found and retrieved from local/national Construction Costs and Allied Partner Companies database(s) **442**, **443**, and then presented by means of visual communication devices, plain language narratives, and tabular information. As the user evaluates each option, it is rendered inside the virtual model of the room or space for which the selection is being made, and both a locally gauged Cost Index reflecting how it affects the Construction Budget allowance for that given category, and a brief pros/cons Narrative are generated; as well as a Tabulation of certain metrics, the logical analysis of which can better inform the decision.

[0062] Only a finite number of options are made available by the system at any given time, since all of them must be compatible with the design intent of the finally chosen building design. For each category, there may be multiple different options to be evaluated by the user. The options may include, for example, an architect's choice **474**, an economical choice **475**, and a greener choice **476**. Additional and/or different choices may also be presented.

[0063] The Architect's Choice **474** may be the option that best matches the design intent, Construction Budget, and overall user preferences, as reflected in the determined metrics resulting from Steps 2 through 6 of Phase I. The Economical Choice **475** offers the most affordable option within any given category finite universal set. The Greener

Choice **476** is the most ecologically sensitive option available for any given category. It offers an upgrade for a specific product or material in terms of Environmental Response, beyond the particular level determined in Step 6 of Phase I. In addition to all the data provided with every option, an indicator of Carbon Footprint and LEED rating points achievable by that choice are included, to better inform the decision.

[0064] Besides the Architect's, Economical and Greener Choices, the user may be provided with an "Other Choices" **477** option, where additional options within a permissible range of compatibility with the design intent are generated for evaluation, varying in price point. The user has the option to override all offered choices for some categories, and directly input a material, manufacturer or product of the user's preference. Preset interior design packages can also be chosen for the finally selected building design. Once the virtual tour is finished, and selections made for all materials, products and finishes categories, the system's workflow navigator presents their summary for confirmation **478**.

[0065] If the user decides to revisit any given selection, or finds out that some choices might have pushed the construction budget above acceptable limits, the System's workflow navigator allows the user to jump backwards in the workflow **479**, re-entering virtual rooms or spaces for evaluation, rendering and selection of new choices.

[0066] After confirmation of all construction materials, products and selections, a complete set of Construction Documents including, but not limited to, Working Drawings and Specifications, and a final Construction Cost Estimate, are generated as the final output **480**.

[0067] **FIGS. 5A through 5G** shows an example of a buildable envelope determination process that may be implemented in the building design selection method of **FIGS. 3 and 4. FIGS. 5A through 5G** loosely illustrates the processes that take place within Step 1 of PHASE I of the System's cloud application workflow navigator, in any of the modules illustrated in **FIG. 2**, as well as any other module that might be created hereafter.

[0068] As shown in **FIG. 5A**, a site plan **510** may be generated representing the zoning constraints and legal description of the site obtained in Phase 1 of the building design process. The site plan **510** may illustrate any placement constraints for placing, for example, a main building **512** or an outbuilding **514** on the site lot **516**.

[0069] **FIG. 5B** illustrates the retrieval of the site topography **518**, and the rendering of the site topography is shown in **FIG. 5C**. **FIG. 5D** illustrates a rendering of the physical description and any constraints associated with the site. For example, as shown in **FIG. 5D**, a tree **520** to be considered when placing a building is shown. Sun exposure **522** is also illustrated as well as utility access points **524**. Any other constraints may also be illustrated, allowing a user to easily see how placement of a building fits the underlying topography of a site.

[0070] As described above, in order to construct a building that fits the existing style of the neighborhood, context analysis may be performed relative to buildings or structures surrounding a planned site. As shown in **FIG. 5E**, the buildings surrounding a planned side may be rendered along with a proposed building.

[0071] As shown in **FIG. 5F**, the generated building envelope may be rendered along with the surrounding buildings. As shown in **FIG. 5G**, a building design is shown along

with the surrounding buildings. As described above, multiple building design options may be generated. The system allows a user to view each prospective design and how the finished design fits in the site.

[0072] As described above, various questionnaires may be presented to a user to aid in generating a building design. For example, a zoning questionnaire may be provided to a user when zoning information describing the site cannot otherwise be obtained, or where the obtained information can be further supplemented by gathering user input. The zoning questionnaire may be configured to obtain specific parameters and ranges that may be used to generate the zoning constraints of the site with enough precision to enable testing of building designs. The zoning questionnaire may ask the user to provide a zoning district and/or transect zone associated with a site. The user may also be asked to define a plurality of variables associated with a site such as, for example, a lot area, building floor area, building height, principle building elevation, and/or other site-related variables.

[0073] The user may also be asked questions related to the functional use of the building to be placed on the site. Questions may include, for example, questions related to a type of building (e.g., residential, commercial, civic, etc.). The zoning questionnaire may also include questions related to the proposed building's disposition on the lot, such as the lot occupancy, building setbacks, distance between main building and any outbuildings, etc. The questionnaire may also seek to obtain building configuration information, such as information about building enclosures, heights, openings, encroachments, street screens, etc. Any architectural standards associated with the zone in which the site is located may also be obtained via the questionnaire. Such information

may include any restrictions or requirements related to, for example, roof standards, building wall materials, arcades, porches/balconies, fences/walls/hedges, awnings/canopies, chimneys, gutters/downspouts, swimming pools, greenhouses, colors, etc. The questionnaire may also present questions related to any parking calculations and standards, loading standards, landscape standards, sustainability standards, and/or other zoning related information. An example of a detailed zoning questionnaire that may be presented in shown in Appendix A.

[0074] A site questionnaire may also be presented to obtain additional site descriptive information from a user. The site questionnaire may be configured to collect geographical and other relevant data to generate a tridimensional and precise site rendition and building envelope, with enough precision to enable testing of building designs. For example, the site questionnaire may ask a user to confirm information obtained from various databases and to provide some additional descriptive information. The site questionnaire may request a description of the land including, for example, lot classifications (e.g., lot type, parking access, etc.), survey data (e.g., orientation, boundaries, reference points, easements, thoroughfares, utilities, existing structures, etc.), geotechnical data (e.g., soil description, bearing capacity, percolation rate, water table depth, frost line depth, etc.) environmental data (e.g., hydrology, natural features, flora, fauna, views, noise, etc.), and/or any other sited related data. An example of a site questionnaire is shown in Appendix B.

[0075] To obtain information about the area/neighborhood surrounding a building site, a contextual questionnaire may be presented. The contextual questionnaire may be configured to collect relevant information about the immediate urban context surrounding

the site, collected in order to better match and arrange building designs within the compatible population generated. The contextual questionnaire may be request information about, for example, public transportation, joint use easements, adjacent lots, and/or any other data that might be useful in obtaining a contextual view of the area/neighborhood encompassing a proposed building site. An example of a contextual questionnaire is shown in Appendix C.

[0076] Using the information obtained via database access as well as user questionnaires, the system is able to perform a plurality of calculations to be used in creating a population of building designs that meet the proposed constraints. For example, the precise zoning constraints may be used to evaluate individual building designs in order to include them or not into the population generated. Similar sets of formulae and tables could be employed to further evaluate individual building designs based on other site and contextual information. One enabling example of a set of formulae and tables used to process and analyze zoning information collected is shown in Appendix D.

[0077] As detailed in Appendix D, information obtained from the zoning database and/or zoning questionnaires may be used to evaluate whether a proposed design is an appropriate candidate. The determination and analysis of the zoning constraints may use Boolean Algebra logic, according to which the values of the variables are the truth values "*true*" and "*false*", identified or represented as "*1*" and "*0*" respectively, which should not be confused with the integers 1 and 0. This logical analysis performs the basic operations of logical conjunction and logical disjunction, as well reflexive relations including "*is equal to*", "*is greater than or equal to*" and "*is less than or equal to*". Thus,

for each perspective design, a plurality of variables, as described herein, are evaluated against the zoning constraints to determine whether the design can be included as a viable design option.

[0078] According to an aspect of the disclosure, a computer readable medium is provided containing a computer program, which when executed on, for example, the server **120** (shown in **FIG. 1**), the user computer **110** (shown in **FIG. 1**), or the network **150** (shown in FIG. 1), causes the process shown in **FIGS. 3** and **4** to be carried out. The computer program may be tangibly embodied in the computer readable medium, comprising a code segment or code section for each of the steps in **FIG. 3** and **4**.

[0079] A "computer," as used in this disclosure, means any machine, device, circuit, component, or module, or any system of machines, devices, circuits, components, modules, or the like, which are capable of manipulating data according to one or more instructions, such as, for example, without limitation, a processor, a microprocessor, a central processing unit, a general purpose computer, a super computer, a personal computer, a laptop computer, a palmtop computer, a notebook computer, a desktop computer, a workstation computer, a server, a cloud computer, or the like, or an array of processors, microprocessors, central processing units, general purpose computers, super computers, personal computers, laptop computers, palmtop computers, notebook computers, desktop computers, workstation computers, servers, or the like.

[0080] A "server," as used in this disclosure, means any combination of software and/or hardware, including at least one application and/or at least one computer to perform services for connected clients as part of a client-server architecture. The at least one server application may include, but is not limited to, for example, an application

program that can accept connections to service requests from clients by sending back responses to the clients. The server may be configured to run the at least one application, often under heavy workloads, unattended, for extended periods of time with minimal human direction. The server may include a plurality of computers configured, with the at least one application being divided among the computers depending upon the workload. For example, under light loading, the at least one application can run on a single computer. However, under heavy loading, multiple computers may be required to run the at least one application. The server, or any of its computers, may also be used as a workstation.

[0081] A "database," as used in this disclosure, means any combination of software and/or hardware, including at least one application and/or at least one computer. The database may include a structured collection of records or data organized according to a database model, such as, for example, but not limited to at least one of a relational model, a hierarchical model, a network model or the like. The database may include a database management system application (DBMS) as is known in the art. The at least one application may include, but is not limited to, for example, an application program that can accept connections to service requests from clients by sending back responses to the clients. The database may be configured to run the at least one application, often under heavy workloads, unattended, for extended periods of time with minimal human direction.

[0082] A "communication link," as used in this disclosure, means a wired and/or wireless medium that conveys data or information between at least two points. The wired or wireless medium may include, for example, a metallic conductor link, a radio

frequency (RF) communication link, an Infrared (IR) communication link, an optical communication link, or the like, without limitation. The RF communication link may include, for example, Wi-Fi, Wi-MAX, IEEE 802.11, DECT, 0G, 1G, 2G, 3G or 4G cellular standards, Bluetooth, and the like.

[0083] A "network," as used in this disclosure means, but is not limited to, for example, at least one of a local area network (LAN), a wide area network (WAN), a metropolitan area network (MAN), a personal area network (PAN), a campus area network, a corporate area network, a global area network (GAN), a broadband area network (BAN), a cellular network, the Internet, a network cloud, or the like, or any combination of the foregoing, any of which may be configured to communicate data via a wireless and/or a wired communication medium.

[0084] The terms "including," "comprising," and variations thereof, as used in this disclosure, mean "including, but not limited to," unless expressly specified otherwise.

[0085] The terms "a," "an," and "the," as used in this disclosure, means "one or more," unless expressly specified otherwise.

[0086] Devices that are in communication with each other need not be in continuous communication with each other, unless expressly specified otherwise. In addition, devices that are in communication with each other may communicate directly or indirectly through one or more intermediaries.

[0087] Although process steps, method steps, algorithms, or the like, may be described in a sequential order, such processes, methods and algorithms may be configured to work in alternate orders. In other words, any sequence or order of steps

that may be described does not necessarily indicate a requirement that the steps be performed in that order. The steps of the processes, methods or algorithms described herein may be performed in any order practical. Further, some steps may be performed simultaneously.

[0088] When a single device or article is described herein, it will be readily apparent that more than one device or article may be used in place of a single device or article. Similarly, where more than one device or article is described herein, it will be readily apparent that a single device or article may be used in place of the more than one device or article. The functionality or the features of a device may be alternatively embodied by one or more other devices, which are not explicitly described as having such functionality or features.

[0089] A "computer-readable medium," as used in this disclosure, means any medium that participates in providing data (for example, instructions), which may be read by a computer. Such a medium may take many forms, including non-volatile media, volatile media, and transmission media. Non-volatile media may include, for example, optical or magnetic disks and other persistent memory. Volatile media may include dynamic random access memory (DRAM). Transmission media may include coaxial cables, copper wire and fiber optics, including the wires that comprise a system bus coupled to the processor. Transmission media may include or convey acoustic waves, light waves and electromagnetic emissions, such as those generated during radio frequency (RF) and infrared (IR) data communications. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, any other magnetic medium, a CD-ROM, DVD, any other optical medium, punch

cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASH-EEPROM, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read.

[0090] Various forms of computer readable media may be involved in carrying sequences of instructions to a computer. For example, sequences of instruction (i) may be delivered from a RAM to a processor, (ii) may be carried over a wireless transmission medium, and/or (iii) may be formatted according to numerous formats, standards or protocols, including, for example, Wi-Fi, Wi-MAX, IEEE 802.11, DECT, 0G, 1G, 2G, 3G or 4G cellular standards, Bluetooth, or the like.

[0091] While the disclosure has been described in terms of exemplary embodiments, those skilled in the art will recognize that the disclosure can be practiced with modifications in the spirit and scope of the appended claims. These examples are merely illustrative and are not meant to be an exhaustive list of all possible designs, embodiments, applications or modifications of the disclosure.

ZONING QUESTIONNAIRE

1. **Zoning District / Transect Zone:** _____

   Zoning District / Transect Zone designation for Home Site located at (Address)

2. **Variable Definitions**

   Lot Area to be used for FAR/FLR, Lot Coverage and Green Space Calculations:

   Net Lot Area

   Gross Lot Area

   Building Floor Area to be the sum of all floor areas used for dwelling purpose on all floors of the building, measured from the outside faces of exterior walls or columns; with the possible exception of the following spaces, which may be either not countable or countable as half:

	Not countable	Countable as 1/2
Open terraces		
Patios		
Atriums		
Balconies		
Carports		
Garages		
Breezeways		
Tool sheds		
Special purpose areas for common use of occupants, such as recreation rooms or social halls		
Staff space for therapy examination in group care housing		
Basements		
Stairways		
Elevator shafts		
Mechanical equipment rooms		

Any commercial or other nonresidential space

Building Height to be measured from:

Whichever is higher of: (Check all that apply)

Flood Level (FEMA Base Flood Elevation)

Curb Level

Average Sidewalk Elevation

Average Elevation of the Crown of the Road (Street) abutting Home Site

Average Elevation of Finished Building (Home) Site

To:

Highest point of the Roof: (Check all that apply)

Flat Roof

Highest point of a Flat Roof

Highest point of the Coping of a Flat Roof

Gable, Gambrel and Hip Roof

Eave Line

Average height between Eaves and Ridge

Top of the Roof

Mansard Roof

Deck Line

Highest point of Coping or Parapet

Shed Roof

Average height between High and Low points

Highest point of Coping or Parapet

Highest point of the Building

First-Floor Elevation of a Principal Building to be set with regards to whichever is higher of: (Check all that apply)

Average Elevation of the Crown of the Road (Street) abutting Home Site

Average Elevation of Finished Building (Home) Site

Average Sidewalk Elevation

FEMA Base Flood Elevation

3. **Building Function and Uses**

3.1. Maximum Allowed Density: _____ Dwelling Units / Acre, allowed by:

Right Warrant Exception

3.2. Principal Uses

(Check only those that apply)	Permitted (Allowed by Right)	Conditional (Allowed by Warrant or Exception)
Residential		
Single Family Dwelling		
Two-Family Dwellings (Duplex)		
Townhouse		
Multifamily Dwelling		
Community Residence		
Ancillary Unit		
Dormitory		
Home Office		
Live-Work		
Work-Live		
Lodging		
Bed and Breakfast		
Inn		
Hotel		
Office		
Office		
Retail / Commercial		
Open Market Building		
Retail Building		
Display Gallery		
Food Service Establishment		
Marine-related Commercial Establ.		
Kiosk		
Push Cart		
Liquor Selling Establishment		
Adult Entertainment		
Civic		

- Bus Shelter
- Convention Center
- Conference Center
- Exhibition Center
- Fountain or Public Art
- Library
- Live Theater
- Movie Theater
- Museum
- Outdoor Auditorium
- Parking Structure
- Passenger Terminal
- Playground
- Sports Stadium
- Surface Parking Lot
- Religious Assembly

Agriculture

- Grain Storage
- Livestock Pen
- Greenhouse
- Stable
- Kennel

Automotive

- Gasoline
- Automobile Service
- Truck Maintenance
- Drive-Through Facility
- Rest stop
- Roadside Stand
- Billboard
- Shopping Center
- Shopping Mall

Civil Support

- Fire Station

Police Station

Cemetery

Funeral Home

Hospital

Medical Clinic

Educational

College

High School

Trade School

Elementary School

Other-Childcare Center

Industrial

Heavy Industrial Facility

Light Industrial Facility

Truck Depot

Laboratory Facility

Water Supply Facility

Sewer and Waste Facility

Electric Substation

Wireless Transmitter

Cremation Facility

Warehouse

Produce Storage

Mini-Storage

3.3. Accessory Uses

	Permitted (Allowed by Right)	Conditional (Allowed by Warrant or Exception)
Garage		
Carport / Car Shelter		
Home Occupation (other than Home Office)		
Guest House		

Boat House

Play House

Gazebo / Cabana

Storage / Utility Room

Greenhouse

Garden Shed

Trellises

Planters

Fountains

Wood Decks

Swimming Pool

Tennis Court

Screened Enclosures

Wet Docks or Moors

Helistop

4. Building Disposition on Lot

4.1. Lot Occupation

Minimum Lot Size:	_____	Sq. Ft.	Min.
Lot Width:	_____	Ft.	Min.
	_____	Ft.	Max.
Minimum Street Frontage	_____	Ft.	Min.
Lot Coverage	_____	% of Lot Area	Max.
Floor Lot Ratio (FLR)/Floor Area Ratio (FAR)	_____	x Lot Area	Max.
Open Space Requirement	_____	% of Lot Area	Min.

4.2. Building Setbacks

	Principal Front	Secondary Front	Side	Rear	Waterway
Building	Ft. Min.	Ft. Min.	Ft. Min.	Ft. Min.	Ft. Min.
Outbuilding	Ft. Min.	Ft. Min.	Ft. Min.	Ft. Min.	Ft. Min.

Is there a Maximum building setback? Yes No

Principal Secondary

	Front	Front	Side	Rear	Waterway
Building	Ft. Max.	Ft. Max.	Ft. Max.	Ft. Max.	Ft. Max.
Outbuilding	Ft. Max.	Ft. Max.	Ft. Max.	Ft. Max.	Ft. Max.

Building Frontage at Front Setback _____ % of Facade Min.
(Minimum Frontage Buildout)

4.3. Minimum Distance Between Building and Outbuilding: _____ Ft. Min.

4.4. Back-building

Maximum Width: _____ Ft. Max.

4.5. Building Disposition

	Permitted	Not permitted
Edgeyard		
Sideyard		
Rearyard		
Courtyard		

5. Building Configuration

5.1. Private Frontages

	Permitted	Not permitted
Common Yard		
Porch & Fence		
Terrace or Dooryard		
Forecourt		
Stoop		
Shopfront & Awning		
Gallery		
Arcade		

5.2. Building Configuration / Height

Allowed Overall Building Height

No. of Stories	Height

Building	Stories Max.	Ft. Max.
Outbuilding	Stories Max.	Ft. Max.

Story Height

Story Height:	____ Ft. Max.	from Finished Floor to Finished Floor
Ground Level Retail Story Height:	___ Ft. Min. ___ Ft. Max.	from Finished Floor to Finished Floor

Stepbacks

Portions of _____ Ft. or the ____ Story shall step back _____ Ft.
Building above _____ Ft. ____ Story shall step back _____ Ft.

Otherwise,

Portions of Building above _____ Ft. shall set back _____ Ft. in the Horizontal for every _____ Ft. in the vertical dimension,

Otherwise,

Portions of Building above _____ Ft. shall not exceed a height as delineated by a ____ ° degree inward sloping plane.

Arcade & Cornice Height

Arcade Maximum Height::	Ft. Max.
Cornice Minimum Height:	Ft. Min.

Height Benefit

Height Bonus / Benefit: _____ Stories Max. or _____ Ft. Max.

Allowed Height Extensions above Overall Building Height

Fire Walls or Parapets:	_____	Ft. Max.
Trellises:	_____	Ft. Max.
Other ornamental Building features:	_____	Ft. Max.
Rooms or enclosed spaces up to _____ Sq. Ft. or _____ % of roof area:	_____	Ft. Max.

5.3. Minimum Building Size

Minimum Building Size required: (Select applicable)

Minimum Building Area: _____ Sq. Ft.

Minimum Building Volume _____ Cu. Ft.

Minimum Dwelling Unit Size required:

Efficiency / Studio _____ Sq. Ft. Min.

One Bedroom Unit _____ Sq. Ft. Min.

Two Bedroom Unit _____ Sq. Ft. Min.

Three Bedroom Unit _____ Sq. Ft. Min.

Four and more Bedroom Unit _____ Sq. Ft. Min.

5.4. Maximum Ancillary Unit / Guest House Area: _____ Sq. Ft. Max. or _____ % of main Building, whichever is Greater Smaller.

5.5. Openings

Spacing

Pedestrian entrances at First Floor Façade shall occur at a maximum spacing of: _____ Ft. Max.

Vehicular entrances at First Floor Façade shall occur at a minimum spacing of: _____ Ft. Min.

Area

Total Opening Area at Frontage Façade: _____ % Min.

_____ % Max.

Proportions

All Openings' proportion shall be: (Check all allowed options)

Square

Vertical

Horizontal

Doors and windows that operate as sliders are: Permitted / Not Permitted along Frontages

5.6. Encroachments

	First Layer	Second and Third Layers
Stoops	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Open Porches	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Canopies & Awnings	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Balconies	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Bay windows	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Chimneys	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Pilasters & the like	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Cornices	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.
Roofs (Eaves)	_____Ft. or ____ % Max.	_____Ft. or ____ % Max.

5.7. Street Screens

Street Screen Height required: _____ Ft. Min.

_____ Ft. Max.

5.8. First-Floor Elevation

First Floor Elevation of Building to be at: _____ Ft. Min.

(Residential Function) _____ Ft. Max.

6. Architectural Standards

6.1. Roof

Roof Type

	Permitted	Not Permitted
Flat Roofs		
Sloping Roofs		

Flat Roof Requirements

Flat roofs without a Parapet Permitted Not Permitted

Flat roof portion of building shall not exceed ____% of the ground floor area of the building.

Flat roof portion of building: May be visible from street

May not

Flat roofs with a Parapet Permitted Not Permitted

Flat roof portion of building shall not exceed _____% of the ground floor area of the building.

Flat roof portion of building: May / May not Be visible from street

Roof Parapet Minimum Height above roof: _____Inches

Sloping Roof Pitch

Porches, Attached Sheds or Dormers ___:12 or ___% Minimum

All other Sloping Roofs ___:12 or ___% Minimum

Porches, Attached Sheds or Dormers ___:12 or ___% Maximum

All other Sloping Roofs ___:12 or ___% Maximum

Permitted Roof cover materials: (Check all allowed options)

Clay Tile

Concrete Tile

Shingle

Galvanized Aluminum

Galvanized Steel

Copper

Bituminous one-ply and multiple-ply roofing

Planted Surface

6.2. Building Wall Materials

All exterior walls shall be constructed of: (Check all allowed options)

Concrete (cast-in-place)

Concrete (precast)

Concrete masonry

Brick masonry

Stone masonry

Wood stud framing

Logs

Modular construction

Other approved proprietary systems

All exterior walls shall be faced with: (Check all allowed options)

Architectural concrete

Stucco

Brick

Stone

Cementitious siding

Wood siding of _____ species

Logs

Metal siding

Other approved proprietary materials and finishes

6.3. Arcade, Porches and Balconies

Arcade

Arcade shall be no less than _____ Ft. deep

Arcade may overlap the whole width of the sidewalk to within _____ Ft. of the curb, but must clear the sidewalk vertically by at least _____ Ft.

Porches

Minimum Depth: _____ Ft.

Maximum Width along Building façade: _____ Ft. or _____% of Frontage.

Posts and columns shall be constructed of: (Check all allowed options)

Solid Wood

Concrete

Steel

Other

Post / column section shall be a minimum of _____ Inches (nominal) in each dimension

Balconies

Balcony Depth: _____ Ft. Min.

_____ Ft. Max.

Balconies, Balusters and Railings shall be constructed out of: (Check all allowed options)

Wood

Concrete

Wrought Iron

Glass

Other

6.4. Fences, Walls and Hedges

Maximum Height:	Ft. above	Average Elevation of the Crown of the Road (Street) abutting Home Site Average Elevation of Finished Building (Home) Site Average Sidewalk Elevation FEMA Base Flood Elevation
Maximum Height at Visibility Triangle:	Ft. above	Average Elevation of the Crown of the Road (Street) abutting Home Site Average Elevation of Finished Building (Home) Site Average Sidewalk Elevation FEMA Base Flood Elevation

Walls and Fences shall be constructed out of: (Check all allowed options)

Concrete Masonry

Brick Masonry

Stone

Wood

Wrought Iron

Cast Iron

Aluminum Chain Link

Galvanized Steel Chain Link

6.5. Awnings, Canopies and Tents

Awnings shall be made of: (Check all allowed options)

Canvass

Cloth

Other

And their rigid structure of: (Check all allowed options)

Fiberglass

Aluminum

Plastic

Wood

Other

Awning or Carport Canopies shall be built with a Maximum Area of ___Sq. Ft.

Awning or Carport Shelter Slope: ____:12 or ___% Minimum

Awning sides shall remain: Open Closed

Awnings, entrance or shelter canopies projecting over a sidewalk shall leave a vertical clearance of not less than:

Rigid frame _____ Ft. Minimum from Sidewalk Elevation

Valance _____ Ft. Minimum from Sidewalk Elevation

6.6. Chimneys

Chimneys shall be constructed of: (Check all allowed options)

Stone

Brick

Concrete

Metal

Minimum dimensions in plan: _____ In. x _____ In.

Chimneys shall be terminated by: (Check all allowed options)

Cap

Chimney Pot

Chimneys shall not exceed _____ Ft. in Height above the roofline of the building

6.7. Gutters and Downspouts

Gutters shall be: Rectangular in Section

(Check all allowed options)

- Beveled
- Half Round
- Quarter Round
- Cove Mold
- Ogee (K)

Downspouts shall be: Round in Section
(Check all allowed options)

- Square
- Rectangular

6.8. Swimming Pool

	Principal Front	Secondary Front	Side	Rear	Waterway
Setbacks:	Ft. Min.	Ft. Min.	Ft. Min.	Ft. Min.	Ft. Min.

Unless entirely screened in, the Swimming Pool must be surrounded by a protective wall or fence _____ Ft. in Height.

Patios and Decks surrounding Swimming Pool may extend _____ Ft. closer to property lines and waterways, provided that a Minimum _____ Ft. setback is maintained.

6.9. Greenhouse

Greenhouse shall be constructed out of: (Check all allowed options)

- Pipe frame covered with Chain link fencing material and/or dark green Plastic screen
- Pipe frame covered with Chain link fencing material and/or dark green Plastic screen on top of a Masonry wall, provided such Masonry wall does not exceed a Height of _____ Ft. Max. above Finished Grade
- Pipe frame covered with Galvanized metal
- Wood frame covered with Plastic
- Wood frame covered with Glass
- Metal frame covered with Plastic, on top of a Masonry wall, provided such Masonry wall does not exceed a Height of _____ Ft. Max. above Finished Grade

Metal frame covered with Glass, on top of a Masonry wall, provided such Masonry wall does not exceed a Height of _____ Ft. Max. above Finished Grade

Greenhouse footprint shall not exceed _____ Ft. wide by _____ Ft. long, or _____ Sq. Ft.

Wall Height shall not exceed _____ Ft. Max.

Overall Height shall not exceed _____ Ft. Max.

Roof Pitch shall not exceed _____:12 Max.

6.10. Colors

Roof colors shall be: _____, and May / May not be reflective

Exterior wall colors shall be: _____

Any Shade, Blind or other window covering color shall be: _____

7. Parking Calculations and Standards

7.1. Off-street Parking Requirements

Required Number of Parking Spaces: _____

7.2. Parking Dimensions

Open Parking Spaces shall be a Minimum of: _____ Ft. wide by _____Ft. long

Carports shall be a Minimum of:

One Car: _____ Ft. wide by _____ Ft. long

Two Cars: _____ Ft. wide by _____ Ft. long

Garages shall be a Minimum of: (inside dimensions)

One Car: _____ Ft. wide by _____ Ft. long

Two Cars: _____ Ft. wide by _____ Ft. long

7.3. Driveway Dimensions

The vehicular entrance to the Home Site shall be through an approved Private Street or Driveway, and shall be no wider than _____ Ft. at the Frontage Line. The distance between vehicular entrances at the Frontage

Line shall be _____ Ft. Shared driveway width combining ingress and egress shall be a Maximum of _____ Ft.

7.4. Parking and Driveway Setbacks

Off-street Parking shall be permitted, at allowed locations within the lot (Home site), only in portions at least:

_____ Ft. from street lot lines, where parking is perpendicular to such street lot line.

_____ Ft. from street lot lines, where parking is parallel to such street lot line.

No portion of a Driveway shall be within _____ Ft. of a side property line.

7.5. Vision Clearance at Intersections

In Home sites in which yards are required adjacent to streets, nothing shall be erected, planted, or allowed to grow in such a manner as to form a material impediment to visibility within _____ Ft. and _____ Ft. above the street level grade at

Street intersections: for a triangular area extending _____ Ft. along the intersecting street lot lines.

Intersections of Driveways with Streets: for a triangular area extending _____ Ft. along the intersecting edges of the street lot line and the Driveway edges.

7.6. Parking and Garage Location within Lot (Building site)

Off-street parking shall be allocated as follows: (Check all allowed options)

	First Layer	Second Layer	Third Layer
Open Parking spaces			
Garages			
Side or Rear Entry			
Parking Structures			

Off-street parking spaces whose location requires that cars back into a street shall be: Permitted Not permitted

A minimum of _____ Bicycle rack(s) shall be provided within the Public or Private Frontage for every _____ vehicular parking spaces.

7.7. **Parking Area Pavement Materials**

All Driveways and unenclosed Parking Spaces shall be paved with: (Check all allowed options)

Asphaltic concrete

Reinforced concrete

Concrete pavers

Grass-crete or similar permeable pavers

Clay or cement bricks

Wood blocks

Gravel laid in asphalt

Loose gravel (contained)

Other

8. **Loading Standards**

8.1. Loading Berth Dimensions

Loading Stall or Berth Minimum Dimensions: _____ Ft. by _____ Ft.

8.2. Required number of Loading Berths

Number of Stalls or Berths required: _____

9. **Landscape Standards**

9.1. Green Space Requirement

Minimum of _____ x Lot Area

9.2. Minimum Quantity and Distribution of Shade Trees

A Minimum of _____ tree(s) shall be planted within the First Layer for each 30 Ft. of Frontage Line or portion thereof.

A Minimum of one tree shall be provided for every _____ Sq. Ft. of Lot Area.

9.3. Shade Tree Canopy

Private Lot Minimum Canopy Cover: _____ %

Parking Lot Minimum Canopy Cover: _____ %

Minimum Permeable surface per tree: _____ Ft.

Structural Soil requirement per tree: _____ Ft.

Shade tree canopies, at maturity, shall clear:

At least one story

At least _____ Ft. above Finished Grade.

9.4. Landscaping Requirements in Required Yards Adjacent to Streets

The following Minimum Percentage of such yards shall be kept landscaped: _____ %

9.5. Plant Material

Trees may be of:

Single Species

Multiple Species

Trees shall be:

Naturalistically clustered

Formally arranged

9.6. Pavement

Maximum Percentage of Impervious Pavement allowed: _____ %

Maximum Percentage of Pervious Pavement allowed: _____ %

Decks and paved areas, other than Driveways and Parking areas, shall be constructed of: (Check all allowed options)

Compacted Earth

Wood Planks

Plastic Mesh/Geomat

Crushed Stone/Shell

Cast/Pressed Concrete Paver Block

Grassed Cellular Plastic

Grassed Cellular Concrete

Pervious Asphalt

Asphalt

Concrete

Pervious Concrete

Stamped Asphalt

Stamped Concrete

Pea Gravel

Stone/Masonry Paving Blocks

Wood Paving Blocks on Concrete

Asphalt Paving Blocks

10. Sustainability Standards

10.1. Stormwater Management

Runoff Volume

Retain this percentage of the change in runoff volume between post-development impervious surface and pre-development land surface for the 2 year event: _____ %.

2 Year Allowable Runoff Release Rate as a percentage of the pre-development 2 year discharge rate: _____ %

100 Year Allowable Runoff Release Rate as a percentage of the pre-development 2 year discharge rate: _____ %

General Infiltration Methods (Check all allowed options)

Hard Surface Treatment

Permeable Pavement

Green Roof

Reuse of Rainwater

Reuse, Irrigation

Reuse, Greywater

Linear Infiltration

Vegetated Swale (Bioswale)

Vegetated Stormwater Planters

Area Infiltration

Rain Garden

Retention Basin

10.2. Food Production

Home Site Food Production: (Check all allowed options)

Vegetable Garden

Green Roof

Extensive

Semi-Intensive

Intensive

Vertical Farm

10.3. Energy Generation

Home Site Renewable Energy Generation: (Check all allowed options)

Wind Energy

Solar Photovoltaic

Solar Thermal

Ground-source Heat Exchange (Geothermal)

Biomass

Other renewable

10.4. Composting and Recycling

Is On-Site Organics Processing (Composting) allowed?

Yes No

Is Recycling of resources encouraged or required?

Yes No

SITE QUESTIONNAIRE

11. Land Description

1.1. Lot classification

1.1.1. Lot Type

Corner Lot Interior Lot Through Lot Lot Aggregation

1.1.2. Service and Parking Access

Rear-loaded Front-loaded

1.2. Survey Data

1.2.1. North Arrow

Confirm orientation, as shown on Site Rendition

Confirm

1.2.2. Site Boundaries

Confirm lot line lengths, angles, and curve radii on Site Rendition

Confirm

1.2.3. Reference Points

Confirm location of Benchmarks, Found Iron Pipes, Rods or Nails

Confirm

1.2.4. Easements

For each Easement shown on Site Rendition, identify / confirm:

Easement *n*

Purpose: Utility

Access

Support

Joint use

Scenic

Conservation

Width: _____ Ft

Confirm Location: Confirm

1.2.5. **Dedication**

Dedication Width: _____ Ft. along _____ (Thoroughfare)

1.2.6. **Thoroughfares**

Provide name, hierarchy and R.O.W. width for all Thoroughfares abutting Site, as shown on Site Rendition.

Front Thoroughfare or Passage of higher pedestrian importance (Principal)

Name: _____

R.O.W. Width: _____ Ft.

Public Frontage Assembly Type [1]: A B C D E F G

Confirm dimensions for Public Frontage Assembly Elements:

Curbing	_____	In. Width @ _____ Ft. Radius
Walkway/Sidewalk	_____	Ft. Width
Planter	_____	Ft. Width
Verge	_____	Ft. Width

Front Thoroughfare or Passage of lesser pedestrian importance (Secondary) [2]

Name: _____

R.O.W. Width: _____ Ft

Public Frontage Assembly Type [1]: A B C D E F G

Confirm dimensions for Public Frontage Assembly Elements:

Curbing	_____	In. Width @ _____ Ft. Radius
Walkway/Sidewalk	_____	Ft. Width
Planter	_____	Ft. Width
Verge	_____	Ft. Width

Lane or Alley [3]

Name: _____

R.O.W. Width: _____ Ft

Lot lines abutting: (Check all that apply)

Rear lot line

Side lot line Right Left [4]

Non-front Pedestrian Passage / Path

Name: _____

R.O.W. Width: _____ Ft

Lot lines abutting: (Check all that apply)

Rear lot line

Side lot line Right Left [4]

1.2.7. **Flood Information**

FEMA Base Flood Elevation: _____ Ft. NGVD

Flood Zone: _____

1.2.8. **Reference Elevations**

Provide value of Elevation used as reference for Building Height measurement: *(e.g.* ***Average Sidewalk Elevation:*** *____ Ft. NGVD)* [5]

Provide value of Elevation used as reference for Ground Floor Elevation of a Principal Building: *(e.g.* ***Average Elevation of the Crown of the Road abutting Site:*** *____ Ft. NGVD)* [5]

1.2.9. **Utilities**

Confirm availability and access of existing utilities:

Utility	**Availability**		**Access through**		
	Available	Unavailable	Frontages	Lane/Alley	Easement
Electricity					
Gas					
Water					
Sewer					
Telephone					
Data & TV					

Tag on Site Rendition approximate location of:

Electrical Pole where service cable is supposed to come from

Gas Meter or access point

Water Meter or access point

Telephone Pole where service cable is supposed to come from

Storm Sewer drain

Septic Tank & Leaching Field (If Sewer is unavailable)

Fire Hydrant

1.2.10. **Existing Structures**

Select identified Existing Structures _*buildings, walls, fences, steps, paved areas, etc.* _ to remain by tagging them on the Site Rendition.

For each Existing Building to remain, input front picture and confirm:

Existing Building to Remain *n*

Current Use: _____

Building Type: _____

Lot Coverage: _____ Sq. Ft.

Height: _____ Stories

_____ Ft.

Floor Area: _____ Sq. Ft.

Ground Floor Elevation: _____ Ft. NGVD

Setbacks:

Front _____ Ft.

Left Side _____ Ft.

Right Side _____ Ft.

Rear _____ Ft.

Private Frontage Type [6]: _____

Arcade Depth: _____ Ft. Height: _____ Ft.

Porch One Story Two Story

Awning Box awning Inverse curve

Steep angle Quarter circle

Shallow angle Retractable

Façade Composition: _____ Bays

Roof Type [7]: _____

Fenestration:

Window Type [8] _____

	Proportions	Square	Vertical	Horizontal
Balconies on Facade:				
		Existing	N/A	
		Recessed	Extended	

Building Materials:

Roof _____

Fenestration _____

Exterior walls _____

Building System [9]: _____

Foundation Type [10]: _____

Colors:

Roof _____

Fenestration _____

Exterior walls _____

12. **Geotechnical Data**

12.1. Soil Description

Confirm the soil description obtained from Subsurface Investigation (Geotechnical Report) that best summarizes general condition for Site:

Depth		Description of Soil Materials		
From	To	Description	USCS Classification	AASHTO Classification

Confirm

12.2. Bearing Capacity

Found Soil Bearing Pressure: _____ PSF

12.3. Percolation Rate

Found Soil Percolation Rate: _____ mpi

12.4. Water Table Depth

Ground Water Table elevation at Site found at _____ Ft. below existing ground surface [11].

12.5. Frost Line Depth

Average Frost Line depth at Site found at _____ Ft. below existing ground surface.

12.6. Recommended Foundation Types and Depths

Shallow Foundations

Recommended Not recommended

If recommended, they shall have a Max. allowable Soil Bearing Pressure of _____ PSF

Deep Foundations

Confirm deep foundation systems minimum criteria:

Pile Foundation Type	Approximate Pile Depth Below Existing Land Surface	Size (Inches)	Pile Capacity in Compression (Tons)	Pile Capacity in Tension (Tons)	Allowable Lateral Capacity (Tons)

Confirm

Retaining Walls

Confirm Soil parameters to be used for retaining wall designs:

Soil unit weight moist: _____

Angle of internal friction: _____

Cohesion (C): _____

Minimum depth of foundation (D_f): _____

Coefficient of active earth pressure (K_a): _____

Coefficient of passive earth pressure (K_P): _____

Coefficient of earth pressure at rest (K_O): _____

Angle of wall friction: _____

Confirm

13. **Environmental Data**

13.1. **Hydrology**

Confirm location, as shown on Site Rendition, for:

Wetlands

Water Streams (river, creek or brook)

Water Bodies (sea, lake)

Springs

Major Natural Drainage patterns (gullies, dry gulches or ravines)

Major Manmade Drainage structures (culverts, French drains)

Confirm

13.2. **Natural Features**

Tag on Site Rendition approximate location of:

Rock outcroppings

Caves

Bogs

13.3. **Flora**

Tag on Site Rendition those Trees / Wooden areas to remain.

For each Tree / Wooden area to remain, confirm:

Tree / Wooden Area

Tree(s) species: _____

Foliage: Deciduous Evergreen

Average Height: _____ Ft.

13.4. **Fauna**

Identify indigenous animal species whose habitat overlaps Site:

_____

_____

13.5. **Views**

Using center point in Site Rendition as reference, identify orientation of Most Desirable Views

Using center point in Site Rendition as reference, identify orientation of Most Objectionable Views

13.6. **Noise**

Tag on Site Rendition most obnoxious Noise Source.

Describe: _____

CONTEXT QUESTIONNAIRE

14. **Public Transit**

Distance from the Site to the closest Transit Stop is _____ Ft. approx.

Transit Mode is:

Subway

Elevated train

Streetcar

BRT

Bus

Circulator

Other (Specify) _____

15. **Joint Use Easement**

Found Joint Use Easement runs along

Right side lot line Left side lot line

Distance from Center Line of Joint Use Easement to Lot Line is _____ Ft.

16. **Adjacent Lots**

(Option 1: Site is a Corner Lot)

Confirm information about Principal Building at the lot adjacent to the Site, facing the Principal Front Thoroughfare or Passage of higher pedestrian importance. Provide missing information where not available.

Adjacent Building Information

Zoning District / Transect Zone: _____

Current Use: _____

Building Type: _____

Height: _____ Stories

_____ Ft.

Measured Front Setback: _____ Ft.

Does Building abut Site Lot Line? Yes No

Private Frontage Type: _____

Arcade Depth: _____ Ft. Height: _____ Ft.

Porch One Story Two Story

Awning Box awning Inverse curve

Steep angle Quarter circle

Shallow angle Retractable

Façade Composition: _____ Bays

Roof Type: _____

Fenestration:

Window Type _____

Proportions Square Vertical Horizontal

Balconies on Facade:

Existing N/A

Recessed Extended

Building Materials:

Roof _____

Fenestration _____

Exterior walls _____

Building System: _____

Colors:

Roof _____

Fenestration _____

Exterior walls _____

(Option 2: All other Lot types)

Confirm information about Principal Building at the lot adjacent to the **Site Right side Lot Line**, facing the Principal Front Thoroughfare or Passage of

higher pedestrian importance. Provide missing information where not available.

(*Repeat* **Adjacent Building Information**)

Confirm information about Principal Building at the lot adjacent to the **Site Left side Lot Line**, facing the Principal Front Thoroughfare or Passage of higher pedestrian importance. Provide missing information where not available.

(*Repeat* **Adjacent Building Information**)

FORMULAE AND TABLES

ZONING CONSTRAINTS

For Zoning District / Transect Zone identified.

2 - Variable Definitions

Lot Area

- If Net Lot Area "identified" OR "selected", then:

  [(Building Site Area within property lines)] –
  [(Thoroughfare dedication length) x (Thoroughfare dedication depth) =
  Lot Area

- If Gross Lot Area "identified" OR "selected", then:

  [(Building Site Area within property lines)] +
  [(Principal frontage length) x (Principal thoroughfare R.O.W. width/2)] +
  [(Secondary frontage length) x (Secondary thoroughfare R.O.W. width/2)]* +
  [(Open space or waterway frontage length) x (Distance prescribed)] =
  Lot Area

  * This equals zero (0) for all lots other than corner lots.

Building Floor Area

- Formula for Building Floor Area

  Building Floor Area = [Σ (All "Room" AND "Space" areas)]* – [Σ ("Not countable Room" AND "Not countable Space" areas)] – [Σ ("Countable as half Room" AND "Countable as half Space" areas) x 0.50]

  * Areas within the inside perimeter of the outside walls, measured to the exterior of the wall or space boundary.

Building Height

- Determine Bottom Reference *(example in which one is chosen out of two)*

POSSIBLE RELATION CASES BETWEEN BUILDING HEIGHT BOTTOM REFERENCES				
a	b	c	d	e

Case 1	1	0	0	0	0
Case 2	1	1	0	0	0
Case 3	1	0	1	0	0
Case 4	1	0	0	1	0
Case 5	1	0	0	0	1
Case 6	0	1	0	0	0
Case 7	0	1	1	0	0
Case 8	0	1	0	1	0
Case 9	0	1	0	0	1
Case 10	0	0	1	0	0
Case 11	0	0	1	1	0
Case 12	0	0	1	0	1
Case 13	0	0	0	1	0
Case 14	0	0	0	1	1
Case 15	0	0	0	0	1

Where:

a. Flood Level (FEMA Base Flood Elevation).
b. Curb Level.
c. Average Sidewalk Elevation.
d. Average Elevation of the Crown of the Road (Street) abutting Home Site.
e. Average Elevation of Finished Building (Home) Site.

RELATION CASE SELECTION					
	a	**b**	**c**	**d**	**e**
A	1	1	1	1	1
B					
Relation Case (A ∧B)					

Where:

A. Default condition in which all bottom references are possible.
B. Specific condition entailed by specific Zoning Ordinance, in which any given reference (height benchmark) is either included or not.

BUILDING HEIGHT BOTTOM REFERENCE SELECTION			
Reflexive Relation		**Site Value Input**	**Bottom Reference Output**
Case 1	a ≥ a	1	a
Case 2	a ≥ b	1	a
		0	b
Case 3	a ≥ c	1	a
		0	c
Case 4	a ≥ d	1	a
		0	d
Case 5	a ≥ e	1	a
		0	e
Case 6	b ≥ b	1	b
Case 7	b ≥ c	1	b
		0	c
Case 8	b ≥ d	1	b
		0	d
Case 9	b ≥ e	1	b

		0	e
Case 10	c ≥ c	1	c
Case 11	c ≥ d	1	c
		0	d
Case 12	c ≥ e	1	c
		0	e
Case 13	d ≥ d	1	d
Case 14	d ≥ e	1	d
		0	e
Case 15	e ≥ e	1	e

- Determine Top Reference
  - If highest point of the Roof "identified" OR "selected", then:

BUILDING HEIGHT TOP REFERENCE SELECTION				
	A	B	C	Top Reference
FLAT ROOF				
Highest point of flat roof	1			If C = 1, then f
Highest point of flat roof coping	1			If C = 1, then f
GABLE, GAMBREL AND HIP ROOF				
Eave line	1			If C = 1, then g
Average height between eaves and ridge	1			If C = 1, then g
Top of roof	1			If C = 1, then g
MANSARD ROOF				
Deck line	1			If C = 1, then h
Highest point of coping or parapet	1			If C = 1, then h
SHED ROOF				
Average height between high and low points	1			If C = 1, then i
Highest point of coping or parapet	1			If C = 1, then i

Where:

A. Default condition in which all top references are possible.

B. Specific condition entailed by specific Zoning Ordinance, in which any given reference (roof type) is measured to one specific point in exclusivity.

C. Logical conjunction of A and B, also represented as (A ∧B).

  - If highest point of the Building "identified" OR "selected", then:

[(Height of highest point of building)] =
Top Reference

- Formula to evaluate Building Height:

[("Building Height Top Reference" elevation)] –
[("Building Height Bottom Reference" elevation)] =
Building Height

To be used with every roof type condition present in each Building Design to evaluate.

First Floor Elevation of a Principal Building

- Determine Bottom Reference

POSSIBLE RELATION CASES BETWEEN PRINCIPAL BUILDING FIRST FLOOR ELEVATION BOTTOM REFERENCES				
	a	**c**	**d**	**e**
Case 1	1	0	0	0
Case 2	1	1	0	0
Case 3	1	0	1	0
Case 4	1	0	0	1
Case 5	0	1	0	0
Case 6	0	1	1	0
Case 7	0	1	0	1
Case 8	0	0	1	0
Case 9	0	0	1	1
Case 10	O	O	O	1

Where:

a. Flood Level (FEMA Base Flood Elevation).
c. Average Sidewalk Elevation.
d. Average Elevation of the Crown of the Road (Street) abutting Home Site.
e. Average Elevation of Finished Building (Home) Site.

RELATION CASE SELECTION				
	a	**c**	**d**	**e**
A	1	1	1	1
B				
Relation Case (A ∧B)				

Where:

A. Default condition in which all bottom references are possible.
B. Specific condition entailed by specific Zoning Ordinance, in which any given reference (height benchmark) is either included or not.

PRINCIPAL BUILDING FIRST FLOOR ELEVATION BOTTOM REFERENCE SELECTION			
Reflexive Relation		**Building Site Value Input**	**Bottom Reference Output**
Case 1	a ≥ a	1	a
Case 2	a ≥ c	1	a
		0	c
Case 3	a ≥ d	1	a
		0	d
Case 4	a ≥ e	1	a
		0	e
Case 5	c ≥ c	1	c
Case 6	c ≥ d	1	c
		0	d

Case 7	c ≥ e	1	c
		0	e
Case 8	d ≥ d	1	d
Case 9	d ≥ e	1	d
		0	e
Case 10	e ≥ e	1	e

- Formula to evaluate First-Floor Elevation of Principal Building:

[(Building Height)] –
[(Building Height Top Reference) – (Principal Building Height Differential)]* +
[(Building Height Bottom Reference) – (Principal Building First Floor Elevation Bottom Reference)] =
First Floor Elevation of Principal Building

* This is the vertical distance between the benchmark identified as the "Building Height Top Reference" and the Ground Floor of the Building Designs to evaluate.

3 – Building Function and Uses

3.1 Maximum Allowed Density

	MAXIMUM ALLOWED DENSITY	
	B	**Maximum Allowed Density**
1 DU / Acre	1	1 DU / Acre
	0	
2 DU / Acre	1	2 DU / Acre
	0	
…	1	… DU / Acre
	0	
"*n*" DU / Acre	1	"*n*" DU / Acre
	0	

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum density is either the prescribed one _*for the corresponding zoning district or transect zone*_, or not.

"*n*". Maximum density possible within any given Zoning Ordinance.

- Formula to calculate Number of Units allowed in any given Site, as permitted by the corresponding Zoning District / Transect Zone.

[(Lot Area) / (43,560)] x [Maximum Allowed Density] =
Number of Units Allowed

3.2 Principal Uses

- Identify Principal Uses permitted by either right or warrant / exception within applicable zoning district / transect zone.

PRINCIPAL USES – PERMITTED BY "RIGHT"					
	A	B	C	D	E
Residential	1				
Single Family Dwelling	1				
Two-family Dwellings	1				
…	…	…	…	…	…
Mini-Storage	1				

Where:

A. Default condition in which all principal uses are possible.

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given reference (principal use) is either permitted by right *_for the corresponding zoning district or transect zone_*, or not.

C. Logical conjunction of A and B, also represented as (A ∧B).

D. Profile of Building Design to evaluate.

E. Reflexive relation between "C" AND "D" [C=D].

PRINCIPAL USES – PERMITTED BY "WARRANT" OR "EXCEPTION"					
	A	B	C	D	E
Residential	1				
Single Family Dwelling	1				
Two-family Dwellings	1				
…	…	…	…	…	…
Mini-Storage	1				

Where:

A. Default condition in which all principal uses are possible.

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given principal use is either permitted by warrant *_for the corresponding zoning district or transect zone_*, or not.

C. Logical conjunction of A and B, also represented as (A ∧B).

D. Profile of Building Design to evaluate.

E. Reflexive relation between "C" AND "D" [C=D].

3.3 Accessory Uses

- Identify Accessory Uses permitted by either right or warrant / exception within applicable zoning district / transect zone.

ACCESSORY USES – PERMITTED BY "RIGHT"					
	A	B	C	D	E
Garage	1				
Carport / Car Shelter	1				
Home Occupation	1				
…	…	…	…	…	…
Helistop	1				

Where:

A. Default condition in which all accessory uses are possible.

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given reference (accessory use) is either permitted by right *_for the corresponding zoning district or transect zone_*, or not.
C. Logical conjunction of A and B, also represented as (A ∧B).
D. Profile of Building Design to evaluate.
E. Reflexive relation between "C" AND "D" [C=D].

ACCESSORY USES – PERMITTED BY "WARRANT" OR "EXCEPTION"					
	A	**B**	**C**	**D**	**E**
Garage	1				
Carport / Car Shelter	1				
Home Occupation	1				
…	…	…	…	…	…
Helistop	1				

Where:
A. Default condition in which all accessory uses are possible.
B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given reference (accessory use) is either permitted by warrant *_for the corresponding zoning district or transect zone_*, or not.
C. Logical conjunction of A and B, also represented as (A ∧B).
D. Profile of Building Design to evaluate.
E. Reflexive relation between "C" AND "D" [C=D].

4 – Building Disposition on Lot

4.1 Lot Occupation

Lot Size

LOT SIZE					
Lot Size	**B**		**E_1**	**E_2**	**Lot Size Check**
	Minimum	**Maximum**			
1,000 SF					If "E_1 = 1" AND "E_2 = 1", then Include
1,100 SF					If "E_1 = 1" AND "E_2 = 1", then Include
1,200 SF					If "E_1 = 1" AND "E_2 = 1", then Include
…	…	…	…	…	…
"*n*"					If "E_1 = 1" AND "E_2 = 1", then Include

Where:
B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum or maximum lot size is either the prescribed one *_for the corresponding zoning district or transect zone_*, or not.
E_1. Reflexive relation between Building Site Size value input and Minimum Lot Size value corresponding to zoning district or transect zone identified [Building Site Size ≥ Minimum Lot Size] when B = 1.

E_2. Reflexive relation between Site Size value input and Maximum Lot Size value corresponding to zoning district or transect zone identified [Site Size ≤ Maximum Lot Size] when B = 1.

"*n*". Largest Lot Size possible within any given Zoning Ordinance.

Lot Width

LOT WIDTH					
Lot Width	**B**		**E_1**	**E_2**	**Lot Width Check**
	Minimum	**Maximum**			
12 Ft					If "E_1 = 1" AND "E_2 = 1", then Include
18 Ft					If "E_1 = 1" AND "E_2 = 1", then Include
24 Ft					If "E_1 = 1" AND "E_2 = 1", then Include
…	…	…	…	…	…
"*n*"					If "E_1 = 1" AND "E_2 = 1", then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum or maximum lot width is either the prescribed one *_for the corresponding zoning district or transect zone_*, or not.

E_1. Reflexive relation between Building Site Width value input and Minimum Lot Width value corresponding to zoning district or transect zone identified [Building Site Width ≥ Minimum Lot Width] when B = 1.

E_2. Reflexive relation between Site Width value input and Maximum Lot Width value corresponding to zoning district or transect zone identified [Site Size ≤ Maximum Lot Width] when B = 1.

"*n*". Largest Lot Width possible within any given Zoning Ordinance.

- Street Frontage

STREET FRONTAGE			
Minimum Street Frontage	**B**	**E**	**Lot Street Frontage Check**
0 Ft			If E = 1, then Include
1 Ft			If E = 1, then Include
2 Ft			If E = 1, then Include
3 Ft			If E = 1, then Include
…	…	…	…
100 Ft			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum street frontage percent is either the required one *_for the corresponding zoning district or transect zone_*, or not.

E. Reflexive relation between Building Site Street Frontage value input and Minimum Street Frontage value corresponding to zoning district or transect zone identified [Building Site Street Frontage ≥ Minimum Street Frontage] when B = 1.

Lot Coverage

LOT COVERAGE			
Maximum Lot Coverage Percent	**B**	**E**	**Building Design Lot Coverage Check**
0			If E = 1, then Include
1			If E = 1, then Include
2			If E = 1, then Include
3			If E = 1, then Include
…	…	…	…
100			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum lot coverage percent is either the required one *_for the corresponding zoning district or transect zone_*, or not.

E. Reflexive relation between Building Design Footprint value input and Maximum Lot Coverage value corresponding to zoning district or transect zone identified [Building Design Lot Coverage ≤ Maximum Lot Coverage] when B = 1.

- Formula to calculate Maximum Lot Coverage:

[(Maximum Lot Coverage Percent) / (100)] x [(Lot Area)] =
Maximum Lot Coverage

- Formula to calculate Building Design Lot Coverage:

[(Building Design Footprint)] +
[Σ (Other countable spaces Footprints)]* =
Building Design Lot Coverage

Floor Lot Ratio (FLR) or Floor Area Ratio (FAR)

FLR OR FAR			
FLR or FAR	**B**	**E**	**Building Design FLR or FAR Check**
0			If E = 1, then Include
1			If E = 1, then Include
2			If E = 1, then Include
3			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given FLR or FAR is either the required one *_for the corresponding zoning district or transect zone_*, or not.

E. Reflexive relation between Building Design Floor Area value input and FLR or FAR value corresponding to zoning district or transect zone identified [Building Design Floor Area ≤ Maximum Buildable Floor Area] when B = 1.

"n". Highest FLR or FAR possible within any given Zoning Ordinance

- Formula to calculate Maximum Buildable Floor Area:

[("FLR" OR "FAR") x (Lot Area)] +

[(Bonus Percent) / (100)] x [(Lot Area)] * =
Maximum Buildable Floor Area

* When allowed for by the given Zoning Ordinance, and provided all prerequisites are complied with. A verification checklist would be provided tailored to any given Zoning Ordinance to gauge whether the Bonus is applicable, to be confirmed by the user.

Open Space

OPEN SPACE			
Minimum Open Space Percent	**B**	**E**	**Building Design Open Space Check**
0			If E = 1, then Include
1			If E = 1, then Include
2			If E = 1, then Include
3			If E = 1, then Include
…	…	…	…
100			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum open space percent is either the required one *_for the corresponding zoning district or transect zone_*, or not.

E. Reflexive relation between Building Design Open Space Area value input and Minimum Open Space Area value corresponding to zoning district or transect zone identified [Building Design Open Space Area ≥ Minimum Open Space Area] when B = 1.

- Formula to calculate Minimum Open Space Area:

[(Minimum Open Space Percent) / (100)] x [(Lot Area)] =
Minimum Open Space Area

- Formula to calculate Building Design Open Space Area:

[(Lot Area)] – [(Building Design Footprint)] =
Building Design Open Space Area

4.2 Building Setbacks

SETBACK ARRANGEMENTS					
Minimum:	S_1	S_2	S_3	S_4	**ST**
Maximum:	S_5	S_6	S_7	S_8	

Case 1	Principal Front	Secondary Front	Side	Side
Case 2	Principal Front	Side	Principal Front	Side
Case 3	Principal Front	Side	Secondary Front	Side
Case 4	Principal Front	Side	Rear	Side
Case 5	Principal Front	Side	Waterway	Side
Case 6	Principal Front	Side	Waterway	Waterway
Case 7	Principal Front	Side	Rear	Waterway
Case 8	Principal Front	Waterway	Rear	Waterway
Case 9	Waterway*	Side	Rear	Side
Case 10	Waterway*	Waterway	Rear	Side

S_1 through S_4. Minimum Setback values required by Zoning Ordinance for given zoning district or transect zone, corresponding to the sides of a quadrilateral lot arranged clockwise from the side facing principal thoroughfare.

S_5 through S_8. Maximum Setback values required by Zoning Ordinance for given zoning district or transect zone, corresponding to the sides of a quadrilateral lot arranged clockwise from the side facing principal thoroughfare.

ST. Specific condition entailed by specific Building Site, in which any given setback arrangement case is either the appropriate one or not, as dictated by its location.

* Waterway as a principal frontage (Venetian condition).

Minimum Setbacks

BUILDING								
Minimum Setback Values			**B**			**E_1**	**E_2**	**Setbacks Check**
	P. Front	**S. Front**	**Side**	**Rear**	**Waterway**			
0 Ft 0 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 3 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 6 In								If "E_1 = 1" AND "E_2 = 1", then Include
…	…	…	…	…	…	…	…	…
"*n*"								If "E_1 = 1" AND "E_2 = 1", then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum setback distance is either the prescribed one *_for the corresponding zoning district or transect zone_*, or not for each one of the five possible setback types.

E_1. Reflexive relation between Building Design Length value input and Buildable Envelope Length value corresponding to the lot length and zoning district or transect zone identified [Building Design Length ≤ Buildable Envelope Length] when B = 1.

E_2. Reflexive relation between Building Design Width value input and Buildable Envelope Width value corresponding to the lot width and zoning district or transect zone identified [Building Design Width ≤ Buildable Envelope Width] when B = 1.

"*n*". Largest Setback distance possible within any given Zoning Ordinance.

OUTBUILDING			
Minimum Setback Values	**B**	**E_1**	**E_2**	**Setbacks Check**

	P. Front	S. Front	Side	Rear	Waterway			
0 Ft 0 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 3 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 6 In								If "E_1 = 1" AND "E_2 = 1", then Include
…	…	…	…	…	…	…	…	…
"*n*"								If "E_1 = 1" AND "E_2 = 1", then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given setback distance is either the prescribed one *_for the corresponding zoning district or transect zone_*, or not for each one of the five possible setback types.

E_1. Reflexive relation between Building Design Length value input and Buildable Envelope Length value corresponding to the lot length and zoning district or transect zone identified [Building Design Length ≤ Buildable Envelope Length] when B = 1.

E_2. Reflexive relation between Building Design Width value input and Buildable Envelope Width value corresponding to the lot width and zoning district or transect zone identified [Building Design Width ≤ Buildable Envelope Width] when B = 1.

"*n*". Largest Minimum Setback distance possible within any given Zoning Ordinance.

- Formula to calculate Buildable Envelope Length using identified Case:

$$\underline{[(\text{Building Site Length})] - [(S_1 + S_3)] - [\Sigma\ (\text{Thoroughfare dedication depths})]} = \text{Buildable Envelope Length}$$

- Formula to calculate Buildable Envelope Width using identified Case:

$$\underline{[(\text{Building Site Width})] - [(S_2 + S_4)] - [\Sigma\ (\text{Thoroughfare dedication depths})]^*} = \text{Buildable Envelope Width}$$

* Only applicable along Secondary Front (Case 1) when there is a dedication.

Maximum Setbacks

			BUILDING					
Maximum Setback Values			**B**			**E_1**	**E_2**	**Setbacks Check**
	P. Front	**S. Front**	**Side**	**Rear**	**Waterway**			
0 Ft 0 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 3 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 6 In								If "E_1 = 1" AND "E_2 = 1", then Include

…	…	…	…	…	…	…	…	…
"*n*"								If "E_1 = 1" AND "E_2 = 1", then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum setback distance is either the prescribed one for each of the five possible setback types *_given the corresponding zoning district or transect zone_*, or not.

E_1. Reflexive relation between Building Site Length value input and Maximum Overall Length value corresponding to the lot length, building design being checked, and zoning district or transect zone identified [Building Site Length ≤ Maximum Overall Length] when B = 1.

E_2. Reflexive relation between Building Site Width value input and Maximum Overall Width value corresponding to the lot width, building design being checked, and zoning district or transect zone identified [Building Site Width ≤ Maximum Overall Width] when B = 1.

"*n*". Largest Maximum Setback distance possible within any given Zoning Ordinance.

OUTBUILDING

Maximum Setback Values	**B**					**E_1**	**E_2**	**Setbacks Check**
	P. Front	**S. Front**	**Side**	**Rear**	**Waterway**			
0 Ft 0 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 3 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 6 In								If "E_1 = 1" AND "E_2 = 1", then Include
…	…	…	…	…	…	…	…	…
"*n*"								If "E_1 = 1" AND "E_2 = 1", then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum setback distance is either the prescribed one for each of the five possible setback types *_given the corresponding zoning district or transect zone_*, or not.

E_1. Reflexive relation between Building Site Length value input and Maximum Overall Length value corresponding to the lot length, building design being checked, and zoning district or transect zone identified [Building Site Length ≤ Maximum Overall Length] when B = 1.

E_2. Reflexive relation between Building Site Width value input and Maximum Overall Width value corresponding to the lot width, building design being checked, and zoning district or transect zone identified [Building Site Width ≤ Maximum Overall Width] when B = 1.

"*n*". Largest Maximum Setback distance possible within any given Zoning Ordinance.

- Formula to calculate Maximum Overall Length:

$$\underline{[(\text{Building Design Length})] + [(S_5 + S_7)] + [\Sigma\ (\text{Thoroughfare dedication depths})]} = \text{Maximum Overall Length}$$

- Formula to calculate Maximum Overall Width:

$$\underline{[(\text{Building Design Width})] + [(S_6 + S_8)] + [\Sigma\ (\text{Thoroughfare dedication depths})]^*} = \text{Maximum Overall Width}$$

* Only applicable along Secondary Front (Case 1) when there is a dedication.

Building Frontage at Front Setback

BUILDING FRONTAGE AT FRONT SETBACK			
Minimum Frontage Percent	**B**	**E**	**Building Design Frontage Check**
0			If E = 1, then Include
1			If E = 1, then Include
2			If E = 1, then Include
3			If E = 1, then Include
…	…	…	…
100			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum street frontage percent is either the required one *_for the corresponding zoning district or transect zone_*, or not.

E. Reflexive relation between Building Design Frontage value input and Minimum Building Frontage at Front Setback required value corresponding to zoning district or transect zone identified [Building Design Street Frontage ≥ Minimum Building Frontage at Front Setback required] when B = 1.

- Formula to calculate Minimum Building Frontage at Secondary Road Required:

[(Minimum Frontage Percent) / (100)] x [(Lot Width) – (S_2 + S_4 + Thoroughfare dedication depth)*] =
Minimum Building Frontage at Front Setback

* Only applicable along Secondary Front (Case 1) when there is a dedication.

4.3 Minimum Distance Between Building and Outbuilding

MINIMUM DISTANCE BETWEEN BUILDING AND OUTBUILDING			
Minimum Distance Between Building and Outbuilding	**B**	**E**	**Minimum Distance Check**
0 Ft 0 In			If E = 1, then Include
0 Ft 3 In			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum distance between building and outbuilding is either the prescribed one or not.

E. Reflexive relation between calculated Building Design Distance Between Building and Outbuilding on one hand, and the Minimum Distance Between Building and Outbuilding identified as required by the Zoning Ordinance [Building Design Distance Between Building and Outbuilding ≥ Minimum Distance Between Building and Outbuilding], when B = 1.

"*n*". Largest Minimum Distance Between Building and Outbuilding possible within any given Zoning Ordinance.

- Formula to calculate Building Design Distance Between Building and Outbuilding:

[(Building Site Length)] – [(Building Design Length) + (S_1)* + (Outbuilding Design Length) + (S_3)**] =
Building Design Distance Between Building and Outbuilding

* For Building.
** For Outbuilding.

4.4 Back-building

BACK-BUILDING WIDTH			
Maximum Back-building Width	**B**	**E**	**Maximum Width Check**
1 Ft 0 In			If E = 1, then Include
1 Ft 3 In			If E = 1, then Include
1 Ft 6 In			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum back-building width is either the prescribed one or not.

E. Reflexive relation between Back-building Width value input for the Building Design being tested on one hand, and the Maximum Back-building Width identified as required by the Zoning Ordinance [Back-building Design Width ≤ Maximum Back-building], when B = 1.

"*n*". Largest Maximum Back-building Width possible within any given Zoning Ordinance.

4.5 Building Disposition

BUILDING DISPOSITION PERMITTED				
	A	**B**	**C**	**Building Disposition Check**
Edgeyard	1			If C = 1, then Include
Sideyard	1			If C = 1, then Include
Rear yard	1			If C = 1, then Include
Courtyard	1			If C = 1, then Include

Where:

A. Default condition in which all top references are possible.

B. Specific condition entailed by specific Zoning Ordinance, in which any given building disposition is permitted or not.

C. Logical conjunction of A and B, also represented as (A ∧B).

5 – Building Configuration

5.1 Private Frontages

PRIVATE FRONTAGES PERMITTED				
Private Frontages	**A**	**B**	**C**	**Private Frontage Check**
Common Yard	1			
Porch & Fence	1			
Terrace or Dooryard	1			
Forecourt	1			
Stoop	1			
Shopfront and Awning	1			

Gallery	1
Arcade	1

Where:

A. Default condition in which all top references are possible.

B. Specific condition entailed by specific Zoning Ordinance, in which any given building disposition is permitted or not.

C. Logical conjunction of A and B, also represented as (A ∧B).

5.2 Building Configuration / Height

Allowed Overall Building Height

ALLOWED OVERALL BUILDING HEIGHT - FEET			
Maximum Height Allowed	**B**	**E**	**Building Height Check**
10 Ft			If E = 1, then Include
11 Ft			If E = 1, then Include
12 Ft			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum height is either the prescribed one *_given the corresponding zoning district or transect zone_*, or not.

E. Reflexive Relation between Building Height and Maximum Height Allowed, as identified required by the Zoning Ordinance [Building Height ≤ Maximum Height Allowed + Height Benefit], when B = 1. Building Height is calculated using formula in 2-Variable Definitions (Building Height), with applicable Bottom and Top reference value inputs for given Building Site and Building Design to check.

"*n*". Highest value of Maximum Height Allowed possible within any given Zoning Ordinance.

ALLOWED OVERALL BUILDING HEIGHT - STORIES			
Maximum Height Allowed	**B**	**E**	**Building Height Check**
1 Story			If E = 1, then Include
2 Stories			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum height is either the prescribed one *_given the corresponding zoning district or transect zone_*, or not.

E. Reflexive Relation between Height in Stories for Building Design to check and Maximum Height Allowed, as identified required by the Zoning Ordinance [Height in Stories ≤ Maximum Height Allowed + Height Benefit], when B = 1.

"*n*". Highest value of Maximum Height Allowed possible within any given Zoning Ordinance.

ALLOWED OVERALL OUTBUILDING HEIGHT - FEET			
Maximum Height Allowed	**B**	**E**	**Building Height Check**
10 Ft			If E = 1, then Include
11 Ft			If E = 1, then Include
12 Ft			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum height is either the prescribed one *_given the corresponding zoning district or transect zone_*, or not.

E. Reflexive Relation between Outbuilding Height and Maximum Height Allowed, as identified required by the Zoning Ordinance [Outbuilding Height ≤ Maximum Height Allowed], when B = 1. Outbuilding Height is calculated using formula in 2-Variable Definitions (Building Height), with applicable Bottom and Top reference value inputs for given Building Site and Building Design to check.

"*n*". Highest value of Maximum Height Allowed possible within any given Zoning Ordinance.

ALLOWED OVERALL OUTBUILDING HEIGHT - STORIES			
Maximum Height Allowed	**B**	**E**	**Building Height Check**
1 Story			If E = 1, then Include
2 Stories			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum height is either the prescribed one *_given the corresponding zoning district or transect zone_*, or not.

E. Reflexive Relation between Height in Stories for Building Design (Outbuilding) to check and Maximum Height Allowed, as identified required by the Zoning Ordinance [Height in Stories ≤ Maximum Height Allowed], when B = 1.

"*n*". Highest value of Maximum Height Allowed possible within any given Zoning Ordinance.

Story Height

STORY HEIGHT			
Maximum Height Allowed	**B**	**E**	**Story Height Check**
10 Ft			If E = 1, then Include
11 Ft			If E = 1, then Include
12 Ft			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum story height is either the prescribed one *_given the corresponding zoning district or transect zone_*, or not.

E. Reflexive Relation between Building Design Story Height value input and Maximum Height Allowed, as identified required by the Zoning Ordinance [Building Design Story Height ≤ Maximum Height Allowed], when B = 1.

"*n*". Highest value of Maximum Height Allowed possible within any given Zoning Ordinance.

GROUND FLOOR LEVEL RETAIL STORY HEIGHT			
Maximum Height Allowed	**B**	**E**	**Story Height Check**
10 Ft			If E = 1, then Include
11 Ft			If E = 1, then Include
12 Ft			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum story height is either the prescribed one *_given the corresponding zoning district or transect zone_*, or not.

E. Reflexive Relation between Building Design Ground Floor Level Retail Story Height value input and Maximum Height Allowed, as identified required by the Zoning Ordinance [Building Design Ground Floor Level Retail Story Height ≤ Maximum Height Allowed], when B = 1.

"*n*". Highest value of Maximum Height Allowed possible within any given Zoning Ordinance.

Stepbacks

- Select applicable Stepback Case formula, given the Zoning Ordinance:

MINIMUM STEPBACK CASE FORMULAE	
Case 1	If Overall Building Height > Podium Height prescribed by Zoning Ordinance, then Stepback = Distance required by Zoning Ordinance. If Portion of Overall Building Height after Stepback > Maximum Stepback Height prescribed by Zoning Ordinance, then Stepback 2 = Distance required by Zoning Ordinance.
Case 2	If Overall Building Height > Podium Height prescribed by Zoning Ordinance, then Stepback = [(Overall Building Height) – (Podium Height)] x [(Vertical Coefficient / Horizontal Coefficient)]. Vertical and Horizontal Coefficients as prescribed by Zoning Ordinance.
Case 3	If Overall Building Height > Podium Height prescribed by Zoning Ordinance, then Stepback = [(Overall Building Height) – (Podium Height)] / [(tan α°)]

- Select Podium Height Benchmark, given the Zoning Ordinance:

PODIUM HEIGHT BENCHMARK		
	B	**Podium Height Benchmark Output**
Building Height in Stories	1	Building Height in Stories
	0	Building Height in Feet

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which the Podium Height is considered in stories, or not.

STEPBACKS - FRONT			
Podium Height - Stories	**B**	**E_1**	**Stepback Check**
1 Story			If E_1 = 1, then Include
2 Stories			If E_1 = 1, then Include
3 Stories			If E_1 = 1, then Include
…	…	…	…
"*n*"			If E_1 = 1, then Include
	or		
Podium Height - Feet	**B**	**E_2**	**Stepback Check**
10 Ft			If E_2 = 1, then Include
11 Ft			If E_2 = 1, then Include
12 Ft			If E_2 = 1, then Include
…	…	…	…
"*n*"			If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given podium height is either the prescribed one or not.
E_1. Reflexive relation between Building Design Stepback value input and Minimum Stepback calculated according to the corresponding formula, given the case [Building Design Stepback ≥ Minimum Stepback], when podium height is measured in stories and B = 1.
E_2. Reflexive relation between Building Design Stepback to check and Minimum Stepback calculated according to the corresponding formula, given the case [Building Design Stepback ≥ Minimum Stepback], when podium height is measured in feet and B = 1.
"*n*". Maximum podium height possible within any given Zoning Ordinance.

STEPBACKS – SIDE AND REAR ABUTTING LOWER DENSITY			
Podium Height - Stories	**B**	**E_1**	**Stepback Check**
1 Story			If E_1 = 1, then Include
2 Stories			If E_1 = 1, then Include
3 Stories			If E_1 = 1, then Include
…	…	…	…
"*n*"			If E_1 = 1, then Include
	or		
Podium Height - Feet	**B**	**E_2**	**Stepback Check**
10 Ft			If E_2 = 1, then Include
11 Ft			If E_2 = 1, then Include
12 Ft			If E_2 = 1, then Include
…	…	…	…
"*n*"			If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given podium height is either the prescribed one or not.
E_1. Reflexive relation between Building Design Stepback value input and Minimum Stepback calculated according to the corresponding formula, given the case [Building Design Stepback ≥ Minimum Stepback], when podium height is measured in stories and B = 1.
E_2. Reflexive relation between Building Design Stepback to check and Minimum Stepback calculated according to the corresponding formula, given the case [Building Design Stepback ≥ Minimum Stepback], when podium height is measured in feet and B = 1.
"*n*". Maximum podium height possible within any given Zoning Ordinance.

Arcade and Cornice Height

ARCADE			
Maximum Height Allowed	**B**	**E**	**Arcade Height Check**
10 Ft			If E = 1, then Include
11 Ft			If E = 1, then Include
12 Ft			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given arcade maximum height is either the prescribed one or not.
E. Reflexive relation between Building Design Arcade Height input value and Maximum Height Allowed [Building Design Arcade Height ≤ Maximum Height Allowed], when B = 1.
"*n*". Highest maximum arcade height allowed possible within any given Zoning Ordinance.

CORNICE

Maximum Height Allowed	B	E	Cornice Height Check
10 Ft			If E = 1, then Include
11 Ft			If E = 1, then Include
12 Ft			If E = 1, then Include
…	…	…	…
"*n*"			If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given cornice maximum height is either the prescribed one or not.

E. Reflexive relation between Building Design Cornice Height input value and Maximum Height Allowed [Building Design Arcade Height ≤ Maximum Height Allowed], when B = 1.

"*n*". Highest maximum cornice height allowed possible within any given Zoning Ordinance.

Height Benefit

HEIGHT BENEFIT			
Height Benefit - Stories	**B**	**Height Benefit Use**	
1 Story		1	Use Height Benefit for Overall Height Calculations
		0	Disregard Height Benefit
2 Stories		1	Use Height Benefit for Overall Height Calculations
		0	Disregard Height Benefit
…	…	…	
"*n*"		1	Use Height Benefit for Overall Height Calculations
		0	
		or	
Height Benefit - Feet	**B**	**Height Benefit Use**	
10 Ft		1	Use Height Benefit for Overall Height Calculations
		0	Disregard Height Benefit
11 Ft		1	Use Height Benefit for Overall Height Calculations
		0	Disregard Height Benefit
…	…	…	…
		…	
"*n*"		1	Use Height Benefit for Overall Height Calculations
		0	Disregard Height Benefit

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given Benefit Height is either permitted or not for the particular Building Site, as determined by requirements checklist tailored to given Zoning Ordinance and Building Site.

"*n*". Maximum height benefit possible within any given Zoning Ordinance.

Allowed Height Extensions above Overall Building Height

- Rooms or Enclosed Spaces above Roof.

ROOMS OR ENCLOSED SPACES			
Maximum Percent of Roof	**B**	**E_1**	**Max. Area for Height Extension Check**
0			If E = 1, then Include up to allowed height
1			If E = 1, then Include up to allowed height
2			If E = 1, then Include up to allowed height
…	…	…	…

100			If E = 1, then Include up to allowed height
		or	
Maximum Area	**B**	**E_2**	**Max. Area for Height Extension Check**
100 SF			If E = 1, then Include up to allowed height
110 SF			If E = 1, then Include up to allowed height
120 SF			If E = 1, then Include up to allowed height
…	…	…	…
"*n*"			If E = 1, then Include up to allowed height

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which the options for maximum percent of the roof area or actual area to be covered by any given room or enclosed space above roof are either the allowed ones or not.

E_1. Reflexive relation between Building Design Room or Enclosed Space Area Percent calculated, and the Maximum Percent of Roof allowed to be covered by such structures [Building Design Room or Enclosed Space Area Percent ≤ Maximum Percent of Roof], when B = 1.

E_2. Reflexive relation between Building Design Rooms or Enclosed Spaces Area above Roof value input, and the Maximum Area allowed to be covered by such structures [Building Design Room or Enclosed Space Area above Roof ≤ Maximum Area], when B = 1.

"*n*". Maximum Area possible within any given Zoning Ordinance.

- Formula to calculate Building Design Room or Enclosed Space Area Percent:

[Σ ("Building Design Rooms" AND "Building Design Enclosed Spaces" areas)* / (100)] x [(Building Design Total Roof Area)] =
Building Design Room or Enclosed Space Area Percent *

* Building Design Room or Enclosed Space areas refer exclusively to such spaces above roof.

ALLOWED HEIGHT EXTENSIONS				
	Maximum Height	**B**	**E**	**Height Extension Check**
Rooms or enclosed spaces	0 Ft			If E = 1, then Include
	1 Ft			If E = 1, then Include
	2 Ft			If E = 1, then Include
	4 Ft			If E = 1, then Include
	5 Ft			If E = 1, then Include
	6 Ft			If E = 1, then Include
	7 Ft			If E = 1, then Include
	8 Ft			If E = 1, then Include
	9 Ft			If E = 1, then Include
	…	…	…	…
	"*n*"			If E = 1, then Include
Fire walls or parapets	0 Ft			If E = 1, then Include
	1 Ft			If E = 1, then Include
	2 Ft			If E = 1, then Include
	4 Ft			If E = 1, then Include
	5 Ft			If E = 1, then Include
	6 Ft			If E = 1, then Include
	7 Ft			If E = 1, then Include

	8 Ft	If E = 1, then Include
	9 Ft	If E = 1, then Include
	… … …	…
	"*n*"	If E = 1, then Include
Trellises	0 Ft	If E = 1, then Include
	1 Ft	If E = 1, then Include
	2 Ft	If E = 1, then Include
	4 Ft	If E = 1, then Include
	5 Ft	If E = 1, then Include
	6 Ft	If E = 1, then Include
	7 Ft	If E = 1, then Include
	8 Ft	If E = 1, then Include
	9 Ft	If E = 1, then Include
	… … …	…
	"*n*"	If E = 1, then Include
Other ornamental features	0 Ft	If E = 1, then Include
	1 Ft	If E = 1, then Include
	2 Ft	If E = 1, then Include
	4 Ft	If E = 1, then Include
	5 Ft	If E = 1, then Include
	6 Ft	If E = 1, then Include
	7 Ft	If E = 1, then Include
	8 Ft	If E = 1, then Include
	9 Ft	If E = 1, then Include
	… … …	…
	"*n*"	If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum height extension is either the prescribed one or not.

E. Reflexive relation between Building Design Height Extensions and the Maximum Height allowed [Building Design Height Extensions ≤ Maximum Height], when B = 1.

"*n*". Maximum Area possible within any given Zoning Ordinance.

5.3 Minimum Building Size

MINIMUM BUILDING SIZE BENCHMARK		
	B	**Minimum Building Size Benchmark**
Minimum Building Area	1	Minimum Building Area
	0	Not Applicable
Minimum Building Volume	1	Minimum Building Volume
	0	Not Applicable

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given benchmark used for purposes of measuring minimum building size is either the prescribed one or not. There may be no benchmark as well.

MINIMUM BUILDING SIZE			
Minimum Building Area	**B**	**E_1**	**Minimum Building Size Check**
0 SF			If E_1 = 1, then Include

1 SF			If E_1 = 1, then Include
2 SF			If E_1 = 1, then Include
…	…	…	…
"*n*"			If E_1 = 1, then Include
		or	
Minimum Building Volume	**B**	**E_2**	**Minimum Building Size Check**
0 CF			If E_2 = 1, then Include
1 CF			If E_2 = 1, then Include
2 CF			If E_2 = 1, then Include
…	…	…	…
"*n*"			If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum building area or volume is either the prescribed one or not.

E_1. Reflexive relation between Building Design Floor Area value input, and the Minimum Building Area required [Building Design Floor Area ≥ Minimum Building Area], when B = 1.

E_2. Reflexive relation between Building Design Volume value input, and the Minimum Building Volume required [Building Design Volume ≥ Minimum Building Volume], when B = 1.

"*n*". Highest value of Minimum Building Area or Volume possible within any given Zoning Ordinance.

- Formula to calculate Building Design Volume:

[Σ ("Building Design Room $_n$" Area) x ("Building Design Room $_n$" Headroom)] * = Building Design Volume

* n: Number of rooms contained with each Building Design

5.4 Maximum Ancillary Unit or Guest House Area

MAXIMUM ANCILLARY UNIT OR GUEST HOUSE AREA BENCHMARK			
Square Footage Limit	**B**	**Maximum Ancillary Unit or Guest House Size Benchmark**	
400 SF		1	Use as Maximum Area "MA_1"
		0	Not Applicable
410 SF		1	Use as Maximum Area "MA_1"
		0	Not Applicable
420 SF		1	Use as Maximum Area "MA_1"
		0	Not Applicable
…	…	…	
		…	
"*n*"		1	Use as Maximum Area "MA_1"
		0	Not Applicable
	or		
Percent Limit	**B**	**Maximum Ancillary Unit or Guest House Size Benchmark**	
0		1	Use to determine Maximum Area "MA_2"
		0	Not Applicable
1		1	Use to determine Maximum Area "MA_2"
		0	Not Applicable
2		1	Use to determine Maximum Area "MA_2"
		0	Not Applicable

…	…	…	
		…	
100		1	Use to determine Maximum Area "MA_2"
		0	Not Applicable

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given square footage limit or percent of Building Design main building floor area are either the prescribed ones or not.

"*n*". Highest value of Minimum Building Area or Volume possible within any given Zoning Ordinance.

- Formula to calculate Maximum Area "MA_2" based on prescribed Percent of Building Design Main Building's Floor Area:

[(Building Design Main Building's Floor Area)] x [(Percent Limit)] = Maximum Area "MA_2"

MAXIMUM ANCILLARY UNIT OR GUEST HOUSE AREA CASES			
Reflexive Relations		**Maximum Area Benchmark Output**	
Case 1*	$MA_1 = MA_2$	1	Use MA_1 to check Building Design, regardless of rule
		0	Not Applicable
Case 2	$MA_1 \geq MA_2$	1	Use MA_1 to check Building Design if GREATER required
		0	Use MA_2 to check Building Design if GREATER required
Case 3	$MA_1 \geq MA_2$	1	Use MA_2 to check Building Design if SMALLER required
		0	Use MA_1 to check Building Design if SMALLER required

* $MA_1 = MA_2 \neq 0$

MAXIMUM ANCILLARY UNIT OR GUEST HOUSE AREA			
Maximum Area Benchmark "MA_1" OR "MA_2" *	**D**	**E**	**Maximum Area Check**
			If E = 1, then Include

Where:

D. Profile of Building Design to evaluate.

E. Reflexive relation between "Maximum Area Benchmark" AND "D" [Maximum Area Benchmark ≥ D].

* According to the applicable Case output from the "MAXIMUM ANCILLARY UNIT OR GUEST HOUSE AREA CASES" table.

5.5 Openings

Spacing

FIRST FLOOR OPENING SPACING					
	Maximum Spacing	**B**	**D**	**E_1**	**Maximum Spacing Check**
Pedestrian	0 Ft				If E_1 = 1, then Include
	1 Ft				If E_1 = 1, then Include
	2 Ft				If E_1 = 1, then Include
	3 Ft				If E_1 = 1, then Include
	4 Ft				If E_1 = 1, then Include
	5 Ft				If E_1 = 1, then Include

	...	...	...	...	...
	"*n*"				If E_1 = 1, then Include

	Minimum Spacing	B	D	E_2	Minimum Spacing Check
Vehicular Entrances	0 Ft				If E_2 = 1, then Include
	1 Ft				If E_2 = 1, then Include
	2 Ft				If E_2 = 1, then Include
	3 Ft				If E_2 = 1, then Include
	4 Ft				If E_2 = 1, then Include
	5 Ft				If E_2 = 1, then Include
	...	...	...	...	...
	"*n*"				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum or minimum spacing is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between the Building Design Pedestrian Entrances Spacing on the front façade and the Maximum Spacing required [Building Design Pedestrian Entrances Spacing ≤ Maximum Spacing], when B = 1.

E_2. Reflexive relation between the Building Design Vehicular Entrances Spacing on the front façade and the Minimum Spacing required [Building Design Vehicular Entrances Spacing ≥ Minimum Spacing], when B = 1.

"*n*". Highest spacing possible within any given Zoning Ordinance.

Area

OPENING AREA AT FRONTAGE FACADE			
Minimum Opening Area	**B**	**E_1**	**Minimum Opening Area Check**
0 SF			If E_1 = 1, then Include
1 SF			If E_1 = 1, then Include
2 SF			If E_1 = 1, then Include
...	...	...	...
"*n*"			If E_1 = 1, then Include

Maximum Opening Area	**B**	**E_2**	**Maximum Opening Area Check**
0 SF			If E_2 = 1, then Include
1 SF			If E_2 = 1, then Include
2 SF			If E_2 = 1, then Include
...	...	...	...
"*n*"			If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum or maximum opening area is either the prescribed one or not.

E_1. Reflexive relation between Building Design Opening Area at Frontage Facade value input, and the Minimum Opening Area required [Building Design Opening Area at Frontage Facade ≥ Minimum Opening Area], when B = 1.

E_2. Reflexive relation between Building Design Opening Area at Frontage Facade value input, and the Maximum Opening Area required [Building Design Opening Area at Frontage Facade ≤ Maximum Opening Area], when B = 1.

"*n*". Highest value of opening area possible within any given Zoning Ordinance.

Proportions

OPENING PROPORTIONS ALLOWED				
	B	**D**	**C**	**Opening Proportions Check**
Square				If C = 1, then Include
Vertical				If C = 1, then Include
Horizontal				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given opening proportion is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

Door and Window Operation

DOOR AND WINDOW OPERATION				
	B	**D**	**C**	**Door and Window Operation Check**
Swinging				If C = 1, then Include
Sliders				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given opening proportion is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

5.6 Encroachments

MAXIMUM ENCROACHMENT BENCHMARK																				
Distance Limit	**A**	**BE**									**Maximum Encroachment Distance**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	E_1	E_2	E_3	E_4	E_5	E_6	E_7	E_8	E_9
0 Ft 0 In	1																		
0 Ft 3 In	1																		
0 Ft 6 In	1																		
…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
"S"	1																		

Percent Limit	**A**	**BP**									**Maximum Encroachment Percent**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9
0	1																		
1	1																		
2	1																		
…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
100	1																		

Where:

A. Default condition in which all distance or percent limits are possible.

BE. Specific condition entailed by profile of specific Zoning Ordinance, in which any given distance limit is either the prescribed maximum encroachment or not for:

1. Stoops
2. Open Porches
3. Canopies and Awnings
4. Balconies

5. Bay Windows
6. Chimneys
7. Pilasters and the like
8. Cornices
9. Roofs (Eaves)

BP. Specific condition entailed by profile of specific Zoning Ordinance, in which any given percent limit is either the prescribed one used to calculate maximum encroachment or not for:

1. Stoops
2. Open Porches
3. Canopies and Awnings
4. Balconies
5. Bay Windows
6. Chimneys
7. Pilasters and the like
8. Cornices
9. Roofs (Eaves)

E_n. Logical conjunction of A and BE_n, also represented as $(A \wedge BE_n)$. If $E_n = 1$ then use corresponding Distance Limit as Maximum Encroachment from Distance Limit "$MEDL_n$".

P_n. Logical conjunction of A and BP_n, also represented as $(A \wedge BP_n)$. If $P_n = 1$ then use corresponding Percent Limit to calculate Maximum Encroachment from Percent Limit "$MEPL_n$".

S. Required minimum setback condition corresponding to any given facade or elevation, as the maximum distance limit possible.

n. Number of encroaching element categories, from 1 through 9, as listed above at BE and BP.

- Formula to calculate Maximum Encroachment from Percent Limit "MEPL" based on prescribed maximum percent of required setback allowed to be encroached (aka "Percent Limit"):

[(Percent Limit "P_n") / (100)] x [(Minimum Setback)] =
Maximum Encroachment from Percent Limit "MEPL"

MAXIMUM ENCROACHMENT CASES			
Reflexive Relations		**Maximum Encroachment Benchmark Output**	
Case 1*	$MEDL_n = MEPL_n$	1	Use MEDL to check Building Design, regardless of rule
		0	Not Applicable
Case 2	$MEDL_n \geq MEPL_n$	1	Use MEDL to check Building Design if GREATER allowed
		0	Use MEPL to check Building Design if GREATER allowed
Case 3	$MEDL_n \geq MEPL_n$	1	Use MEPL to check Building Design if SMALLER allowed
		0	Use MEDL to check Building Design if SMALLER allowed

* $MEDL_n = MEPL_n \neq 0$

MAXIMUM ENCROACHMENT			
Maximum Encroachment Benchmark "$MEDL_n$" OR "$MEPL_n$"	**BDE**	**E**	**Maximum Encroachment Check**
1			If E = 1, then Include
2			If E = 1, then Include
3			If E = 1, then Include

4	If E = 1, then Include
5	If E = 1, then Include
6	If E = 1, then Include
7	If E = 1, then Include
8	If E = 1, then Include
9	If E = 1, then Include

Where:

BDE. Building Design Encroachment value input.

1. Stoops
2. Open Porches
3. Canopies and Awnings
4. Balconies
5. Bay Windows
6. Chimneys
7. Pilasters and the like
8. Cornices
9. Roofs (Eaves)

E. Reflexive relation between Building Design Encroachment and Maximum Encroachment Benchmark for any given encroaching element category [Building Design Encroachment ≤ Maximum Encroachment Benchmark].

5.7 Street Screens

STREET SCREENS				
Minimum Height	**B**	**D**	**E_1**	**Street Screen Height Check**
0 Ft 0 In				If E_1 = 1, then Include
0 Ft 3 In				If E_1 = 1, then Include
0 Ft 6 In				If E_1 = 1, then Include
…	…	…	…	…
"*n*"				If E_1 = 1, then Include

Maximum Height	**B**	**D**	**E_2**	**Street Screen Height Check**
0 Ft 0 In				If E_2 = 1, then Include
0 Ft 3 In				If E_2 = 1, then Include
0 Ft 6 In				If E_2 = 1, then Include
…	…	…	…	…
"*n*"				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum or maximum street screen height is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between Building Design Street Screen Height and Minimum Height allowed for a street screen [Building Design Street Screen Height ≥ Minimum Height].

E_2. Reflexive relation between Building Design Street Screen Height and Minimum Height allowed for a street screen [Building Design Street Screen Height ≤ Maximum Height].

"*n*". Highest street screen height possible within any given Zoning Ordinance.

5.8 First-Floor Elevation

FIRST-FLOOR ELEVATION

Minimum Elevation	B	F-FE	E_1	First-Floor Elevation Check
0 Ft 0 In				If E_1 = 1, then Include
0 Ft 3 In				If E_1 = 1, then Include
0 Ft 6 In				If E_1 = 1, then Include
…	…	…	…	…
"*n*"				If E_1 = 1, then Include

Maximum Elevation	B	F-FE	E_2	First-Floor Elevation Check
0 Ft 0 In				If E_2 = 1, then Include
0 Ft 3 In				If E_2 = 1, then Include
0 Ft 6 In				If E_2 = 1, then Include
…	…	…	…	…
"*n*"				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum or maximum elevation height is either the prescribed one or not.

F-FE. Finished-Floor Elevation for Building Design to evaluate, as calculated according to formula in 2-Variable Definitions (First Floor Elevation for a Principal Building)

E_1. Reflexive relation between Finished-Floor Elevation and Minimum Elevation required [Finished-Floor Elevation ≥ Minimum Elevation], when B = 1.

E_2. Reflexive relation between Finished-Floor Elevation and Maximum Elevation required [Finished-Floor Elevation ≤ Maximum Elevation], when B = 1.

"*n*". Highest street screen height possible within any given Zoning Ordinance.

6 – Architectural Standards

6.1 Roof

Roof Type

ROOF TYPE				
	B	D	C	Roof Type Check
Flat Roofs				If C = 1, then go to FLAT ROOFS table
Sloping Roofs				If C = 1, then go to SLOPING ROOFS table

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given roof type is either permitted or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

Flat Roof Requirements

FLAT ROOFS				
Configuration	B	D	C	Configuration Check
Flat Roofs w/o Parapet				If C = 1, then Include
Flat Roofs with Parapet				If C = 1, then Include

Maximum Area Percent	B	D	E_1	Maximum Area Check
Flat Roofs w/o Parapet				
1				If E_1 = 1, then Include

2				If E_1 = 1, then Include
…	…	…	…	…
100				If E_1 = 1, then Include

Flat Roofs with Parapet				
1				If E_1 = 1, then Include
2				If E_1 = 1, then Include
…	…	…	…	…
100				If E_1 = 1, then Include

Visibility from Street	**B**	**D**	**C**	**Visibility from Street Check**
Flat Roofs w/o Parapet				If C = 1, then Include
Flat Roofs with Parapet				If C = 1, then Include

Roof Parapet Minimum Height	**B**	**D**	**E_2**	**Roof Parapet Minimum Height Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 3 In				If E = 1, then Include
0 Ft 6 In				If E = 1, then Include
…	…	…	…	…
"*n*"				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given flat roof configuration (with or without parapet) is either permitted or not, has a maximum area percent that is either the prescribed one or not, may or may not be visible from the street, and whose parapet minimum height above roof is the prescribed one or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

E_1. Reflexive relation between Building Design Flat Roof Area and Maximum Ground Floor Area under Flat Roof [Building Design Flat Roof Area ≤ Maximum Ground Floor Area under Flat Roof], when B = 1.

E_2. Reflexive relation between Building Design Flat Roof Parapet Height and Roof Parapet Minimum Height [Building Design Flat Roof Parapet Height ≥ Roof Parapet Minimum Height], when B = 1.

"*n*". Highest value of flat roof parapet height possible within any given Zoning Ordinance.

Sloping Roof Pitch

SLOPING ROOFS				
Minimum Pitch	**B**	**D**	**E_1**	**Minimum Pitch Check**
3.0:12 OR 25%				If E_1 = 1, then Include
3.5:12 OR 29%				If E_1 = 1, then Include
4.0:12 OR 33%				If E_1 = 1, then Include
…	…	…	…	…
12:12 OR 100%				If E_1 = 1, then Include

Maximum Pitch	**B**	**D**	**E_2**	**Maximum Pitch Check**
3.0:12 OR 25%				If E_2 = 1, then Include
3.5:12 OR 29%				If E_2 = 1, then Include
4.0:12 OR 33%				If E_2 = 1, then Include
…	…	…	…	…
12:12 OR 100%				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum or maximum sloped roof pitch is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between Building Design Roof Pitch and the Minimum Pitch [Building Design Roof Pitch ≥ Minimum Pitch], when B=1.

E_2. Reflexive relation between Building Design Roof Pitch and the Maximum Pitch [Building Design Roof Pitch ≤ Maximum Pitch], when B=1.

Permitted Roof Cover Materials

ROOF COVER MATERIALS				
	B	**D**	**C**	**Roof Cover Materials Check**
Clay Tile				If C = 1, then Include
Concrete Tile				If C = 1, then Include
Shingle				If C = 1, then Include
Galvanized Aluminum				If C = 1, then Include
Galvanized Steel				If C = 1, then Include
Copper				If C = 1, then Include
Bituminous single or multiple-ply system				If C = 1, then Include
Planted Surface				If C = 1, then Include
Other				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given roof cover material is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

6.2 Building Wall Materials

BUILDING WALL MATERIALS				
	B	**D**	**C**	**Roof Cover Materials Check**
Concrete (cast-in-place)				If C = 1, then Include
Concrete (precast)				If C = 1, then Include
Concrete masonry				If C = 1, then Include
Brick masonry				If C = 1, then Include
Stone masonry				If C = 1, then Include
Wood stud framing				If C = 1, then Include
Logs				If C = 1, then Include
Modular construction				If C = 1, then Include
Other				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given roof cover material is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

6.3 Arcade, Porches and Balconies

Arcades

ARCADES				
Minimum Depth	**B**	**D**	**E_1**	**Minimum Depth Check**
8 Ft 0 In				If E_1 = 1, then Include
8 Ft 6 In				If E_1 = 1, then Include
9 Ft 0 In				If E_1 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_1 = 1, then Include

Minimum Distance from Curb	**B**	**D**	**E_2**	**Minimum Distance from Curb Check**
1 Ft 0 In				If E_2 = 1, then Include
1 Ft 6 In				If E_2 = 1, then Include
2 Ft 0 In				If E_2 = 1, then Include
…	…	…	…	…
8 Ft 0 In				If E_2 = 1, then Include

Minimum Vertical Clearance above Sidewalk	**B**	**D**	**E_3**	**Minimum Vertical Clearance Check**
8 Ft 0 In				If E_3 = 1, then Include
8 Ft 6 In				If E_3 = 1, then Include
9 Ft 0 In				If E_3 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_3 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given arcade has either a certain minimum depth, distance from the curb, and vertical clearance above sidewalk or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between the Building Design Arcade Depth and the Minimum Depth required [Building Design Arcade Depth ≥ Minimum Depth], when B = 1.

E_2. Reflexive relation between the Building Design Arcade Distance from Curb and the Minimum Distance from Curb required [Building Design Arcade Distance from Curb ≥ Minimum Distance from Curb], when B = 1.

E_3. Reflexive relation between the Building Design Arcade Vertical Clearance and the Minimum Vertical Clearance above Sidewalk required [Building Design Arcade Distance from Curb ≥ Minimum Distance from Curb], when B = 1.

Porches

PORCH DEPTH				
Minimum Depth	**B**	**D**	**E_1**	**Minimum Depth Check**
8 Ft 0 In				If E_1 = 1, then Include
8 Ft 6 In				If E_1 = 1, then Include
9 Ft 0 In				If E_1 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_1 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given porch has either a certain minimum depth or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between the Building Design Porch Depth and the Minimum Depth required [Building Design Porch Depth ≥ Minimum Depth], when B = 1.

PORCH WIDTH BENCHMARKS			
Reflexive Relations		**Maximum Porch Width Benchmark Output**	
Case 1	MWD = MWPF	1	Use MWD to check Building Design, regardless of rule
		0	Not Applicable
Case 2	MWD ≥ MWPF	1	Use MWD to check Building Design if GREATER allowed
		0	Use MWPF to check Building Design if GREATER allowed
Case 3	MWD ≥ MWPF	1	Use MWPF to check Building Design if SMALLER allowed
		0	Use MWD to check Building Design if SMALLER allowed

Where:

MWD. Maximum Width Distance

MWPF. Maximum Width as Percent of Frontage

- Formula to calculate Porch Width as Percent of Frontage based on Maximum Width Percent "MWP":

[(Maximum Width Percent) / (100)] x [(Building Design Frontage length)] = Porch Width as Percent of Frontage "MWPF"

PORCH WIDTH				
Maximum Width Distance	**B**	**D**	**E_1**	**Maximum Width Check**
8 Ft 0 In				If E_1 = 1, then Include
8 Ft 6 In				If E_1 = 1, then Include
9 Ft 0 In				If E_1 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_1 = 1, then Include
		or		
Maximum Width as Percent of Frontage	**B**	**D**	**E_2**	**Maximum Width Check**
1				If E_2 = 1, then Include
2				If E_1 = 1, then Include
3				If E_1 = 1, then Include
…	…	…	…	…
100				If E_1 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given porch maximum width or percent of frontage is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between the Building Design Porch Width and the Maximum Width Distance required [Building Design Porch Width ≤ Maximum Width Distance], when B = 1.

E_2. Reflexive relation between the Building Design Porch Width as Percent of Frontage and the Maximum Width Distance required [Building Design Porch Width ≤ Maximum Width Percent], when B = 1.

POST AND COLUMN MATERIALS				
	B	**D**	**C**	**Roof Cover Materials Check**
Solid wood				If C = 1, then Include
Concrete				If C = 1, then Include
Steel				If C = 1, then Include
Other				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given post and column material is either allowed or not.
D. Profile of Building Design to evaluate.
C. Logical conjunction of B and D, also represented as (B ∧D).

POST OR COLUMN SECTION				
Minimum Diameter	**B**	**D**	**E**	**Minimum Section Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 1 In				If E = 1, then Include
0 Ft 2 In				If E = 1, then Include
…	…	…	…	…
"*n*"				If E = 1, then Include

Where:
B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given porch post or column section minimum diameter is either the prescribed one or not.
D. Profile of Building Design to evaluate.
E_1. Reflexive relation between the Building Design Post or Column Section Minimum Diameter and the Minimum Diameter required [Building Design Post or Column Section Minimum Diameter ≥ Minimum Diameter], when B = 1.
"*n*". Largest value of post or column section diameter possible within any given Zoning Ordinance.

Balconies

BALCONY DEPTH				
Minimum Depth	**B**	**D**	**E_1**	**Minimum Depth Check**
0 Ft 0 In				If E_1 = 1, then Include
0 Ft 6 In				If E_1 = 1, then Include
1 Ft 0 In				If E_1 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_1 = 1, then Include

Maximum Depth	**B**	**D**	**E_2**	**Maximum Depth Check**
0 Ft 0 In				If E_2 = 1, then Include
0 Ft 6 In				If E_2 = 1, then Include
1 Ft 0 In				If E_2 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_2 = 1, then Include

Where:
B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given balcony minimum and maximum depth are either the prescribed ones or not.
D. Profile of Building Design to evaluate.
E_1. Reflexive relation between the Building Design Shallowest Balcony Depth and the Minimum Depth required [Building Design Shallowest Balcony Depth ≥ Minimum Depth], when B = 1.
E_2. Reflexive relation between the Building Design Deepest Balcony Depth and the Minimum Depth required [Building Design Shallowest Balcony Depth ≤ Maximum Depth], when B = 1.

BALCONIES, BALUSTERS AND RAILING MATERIALS				
	B	**D**	**C**	**Materials Check**
Wood				If C = 1, then Include
Concrete				If C = 1, then Include

Wrought iron	If C = 1, then Include
Glass	If C = 1, then Include
Other	If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given balcony, baluster and railing material is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

6.4 Fences, Walls and Hedges

Height

- Formula to determine Fence, Wall or Hedge Height:

[("Top of Fence, Wall or Hedge" elevation)] – [(Bottom Reference)] = Fence, Wall or Hedge Height

FENCE, WALL OR HEDGE HEIGHT				
Maximum Height	**B**	**D**	**E**	**Maximum Height Check**
0 Ft 0 In				If E_1 = 1, then Include
0 Ft 6 In				If E_1 = 1, then Include
1 Ft 0 In				If E_1 = 1, then Include
…	…	…	…	…
"*n*"				If E_1 = 1, then Include

Maximum Height at Visibility Triangle	**B**	**D**	**E**	**Maximum Height Check**
0 Ft 0 In				If E_2 = 1, then Include
0 Ft 6 In				If E_2 = 1, then Include
1 Ft 0 In				If E_2 = 1, then Include
…	…	…	…	…
"*n*"				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given fence, wall, or hedge height is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between the Building Design Fence, Wall or Hedge Height and the Maximum Height allowed [Building Design Fence, Wall or Hedge Height ≤ Maximum Height], when B = 1.

E_2. Reflexive relation between the Building Design Fence, Wall or Hedge Height and the Maximum Height allowed [Building Design Fence, Wall or Hedge Height ≤ Maximum Height], when B = 1.

"*n*". Highest value of fence, wall, or hedge height possible within any given Zoning Ordinance.

WALL AND FENCE MATERIALS				
	B	**D**	**C**	**Materials Check**
Concrete masonry				If C = 1, then Include
Brick masonry				If C = 1, then Include
Stone				If C = 1, then Include
Wood				If C = 1, then Include
Wrought iron				If C = 1, then Include

Cast iron	If C = 1, then Include
Aluminum chain link	If C = 1, then Include
Galvanized steel chain link	If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given wall and fence material is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

6.5 Awnings, Canopies and Tents

AWNING MATERIALS				
	B	**D**	**C**	**Materials Check**
Canvass				If C = 1, then Include
Cloth				If C = 1, then Include
Other				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given awning material is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

AWNING RIGID STRUCTURE MATERIALS				
	B	**D**	**C**	**Materials Check**
Fiberglass				If C = 1, then Include
Aluminum				If C = 1, then Include
Plastic				If C = 1, then Include
Wood				If C = 1, then Include
Other				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given awning rigid structure material is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

AWNING OR CARPORT CANOPY MAXIMUM AREA				
Maximum Area	**B**	**D**	**E**	**Maximum Area Check**
0 SF				If E = 1, then Include
1 SF				If E = 1, then Include
2 SF				If E = 1, then Include
…	…	…	…	…
"*n*"				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given awning or canopy maximum area is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Awning or Carport Area and the Maximum Area [Building Design Awning or Carport Area ≤ Maximum Area], when B = 1.

AWNING OR CARPORT SHELTER ROOF SLOPE				
Minimum Pitch	**B**	**D**	**E**	**Minimum Pitch Check**
3.0:12 OR 25%				If E = 1, then Include

3.5:12 OR 29%				If E = 1, then Include
4.0:12 OR 33%				If E = 1, then Include
…	…	…	…	…
12:12 OR 100%				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given awning or canopy shelter roof minimum slope pitch is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Awning or Carport Shelter Roof Pitch and the Minimum Pitch [Building Design Awning or Carport Shelter Roof Pitch ≥ Minimum Pitch], when B = 1.

AWNING SIDES				
	B	**D**	**C**	**Materials Check**
Closed awning sides				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given awning side enclosing condition is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

VERTICAL CLEARANCE ABOVE SIDEWALK				
Minimum Clearance	**B**	**D**	**E_1**	**Vertical Clearance Check**
Rigid Frame				
0 Ft 0 In				If E_1 = 1, then Include
0 Ft 6 In				If E_1 = 1, then Include
1 Ft 0 In				If E_1 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_1 = 1, then Include

Minimum Clearance	**B**	**D**	**E_2**	**Vertical Clearance Check**
Valance				
0 Ft 0 In				If E_2 = 1, then Include
0 Ft 6 In				If E_2 = 1, then Include
1 Ft 0 In				If E_2 = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which the vertical clearance above sidewalk for any given awning, entrance or shelter is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between the Building Design Awning, Entrance or Shelter Rigid Frame Vertical Clearance above Sidewalk and the Minimum Clearance allowed [Building Design Awning, Entrance or Shelter Rigid Frame Vertical Clearance above Sidewalk ≥ Minimum Clearance], when B = 1.

E_1. Reflexive relation between the Building Design Awning, Entrance or Shelter Valance Vertical Clearance above Sidewalk and the Minimum Clearance allowed [Building Design Awning, Entrance or Shelter Valance Vertical Clearance above Sidewalk ≥ Minimum Clearance], when B = 1.

6.6 Chimneys

CHIMNEY MATERIALS				
	B	**D**	**C**	**Materials Check**
Stone				If C = 1, then Include
Brick				If C = 1, then Include
Concrete				If C = 1, then Include
Metal				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given chimney material is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

MINIMUM DIMENSIONS IN PLAN					
	Minimum Dimension	**B**	**D**	**E_1**	**Minimum Dimension Check**
Firebox Width	0 Ft				If E_1 = 1, then Include
	1 Ft				If E_1 = 1, then Include
	2 Ft				If E_1 = 1, then Include
	3 Ft				If E_1 = 1, then Include
	4 Ft				If E_1 = 1, then Include
	5 Ft				If E_1 = 1, then Include
	…	…	…	…	…
	"*n*"				If E_1 = 1, then Include

	Minimum Dimension	**B**	**D**	**E_2**	**Minimum Dimension Check**
Firebox Length	0 Ft				If E_2 = 1, then Include
	1 Ft				If E_2 = 1, then Include
	2 Ft				If E_2 = 1, then Include
	3 Ft				If E_2 = 1, then Include
	4 Ft				If E_2 = 1, then Include
	5 Ft				If E_2 = 1, then Include
	…	…	…	…	…
	"*n*"				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given chimney firebox dimension in plan is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between Building Design Chimney Firebox Width and the Minimum Dimension allowed [Building Design Chimney Firebox Width ≥ Minimum Dimension], when B = 1.

E_2. Reflexive relation between Building Design Chimney Firebox Width and the Minimum Dimension allowed [Building Design Chimney Firebox Length ≥ Minimum Dimension], when B = 1.

CHIMNEY TERMINATION				
	B	**D**	**C**	**Materials Check**
Cap				If C = 1, then Include
Chimney pot				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given chimney pot termination is either the prescribed one or not.

D. Profile of Building Design to evaluate.
C. Logical conjunction of B and D, also represented as (B ∧D).

CHIMNEY HEIGHT ABOVE BUILDING ROOFLINE				
Maximum Height	**B**	**D**	**E**	**Minimum Depth Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 6 In				If E = 1, then Include
1 Ft 0 In				If E = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E = 1, then Include

Where:
B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given chimney minimum height above roofline is either the prescribed one or not.
D. Profile of Building Design to evaluate.
E. Reflexive relation between Building Design Chimney Height and the Maximum Height allowed above roofline [Building Design Chimney Height ≤ Maximum Dimension], when B = 1.

6.7 Gutters and Downspouts

GUTTERS				
Section	**B**	**D**	**C**	**Section Check**
Rectangular				If C = 1, then Include
Beveled				If C = 1, then Include
Half round				If C = 1, then Include
Quarter round				If C = 1, then Include
Cove mold				If C = 1, then Include
Ogee (K)				If C = 1, then Include

Where:
B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given gutter section is either the prescribed one or not.
D. Profile of Building Design to evaluate.
C. Logical conjunction of B and D, also represented as (B ∧D).

DOWNSPOUTS				
Section	**B**	**D**	**C**	**Section Check**
Round				If C = 1, then Include
Square				If C = 1, then Include
Rectangular				If C = 1, then Include

Where:
B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given downspout section is either the prescribed one or not.
D. Profile of Building Design to evaluate.
C. Logical conjunction of B and D, also represented as (B ∧D).

6.8 Swimming Pool

SETBACK ARRANGEMENTS					
Minimum:	**SPS_1**	**SPS_2**	**SPS_3**	**SPS_4**	**ST**
Case 1	Principal Front	Secondary Front	Side	Side	
Case 2	Principal Front	Side	Principal Front	Side	

Case 3	Principal Front	Side	Secondary Front	Side
Case 4	Principal Front	Side	Rear	Side
Case 5	Principal Front	Side	Waterway	Side
Case 6	Principal Front	Side	Waterway	Waterway
Case 7	Principal Front	Side	Rear	Waterway
Case 8	Principal Front	Waterway	Rear	Waterway
Case 9	Waterway*	Side	Rear	Side
Case 10	Waterway*	Waterway	Rear	Side

SPS_1 through SPS_4. Minimum Swimming Pool Setback values required by Zoning Ordinance for given zoning district or transect zone, corresponding to the sides of a quadrilateral lot arranged clockwise from the side facing principal thoroughfare.
ST. Specific condition entailed by specific Building Site, in which any given setback arrangement case is either the appropriate one or not, as dictated by its location.
* Waterway as a principal frontage (Venetian condition).

SWIMMING POOL SETBACKS								
Minimum Setback Values	**B**					**E_1**	**E_2**	**Setbacks Check**
	P. Front	**S. Front**	**Side**	**Rear**	**Waterway**			
0 Ft 0 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 3 In								If "E_1 = 1" AND "E_2 = 1", then Include
0 Ft 6 In								If "E_1 = 1" AND "E_2 = 1", then Include
…	…	…	…	…	…	…	…	…
"*n*"								If "E_1 = 1" AND "E_2 = 1", then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum setback distance is either the prescribed one _*for the corresponding zoning district or transect zone*_, or not for each one of the five possible setback types.

E_1. Reflexive relation between Building Design Swimming Pool Length value input and Swimming Pool Envelope Length value corresponding to the lot length and zoning district or transect zone identified [Building Design Swimming Pool Length ≤ Swimming Pool Envelope Length] when B = 1.

E_2. Reflexive relation between Building Design Swimming Pool Width value input and Swimming Pool Envelope Width value corresponding to the lot length and zoning district or transect zone identified [Building Design Swimming Pool Width ≤ Swimming Pool Envelope Width] when B = 1.

"*n*". Largest Setback distance possible within any given Zoning Ordinance.

- Formula to calculate Swimming Pool Envelope Length using identified Case:

$$\frac{[(\text{Building Site Length})] - [(SPS_1 + SPS_3)] - [\Sigma\ (\text{Thoroughfare dedication depth})]}{=}$$

Swimming Pool Envelope Length

- Formula to calculate Swimming Pool Envelope Width using identified Case:

[(Building Site Width)] – [(SPS_2 + SPS_4)] – [Σ (Thoroughfare dedication depth)]* = Swimming Pool Envelope Width

* Only applicable along Secondary Front (Case 1) when there is a dedication.

SWIMMING POOL PROTECTIVE FENCE HEIGHT				
Minimum Height	**B**	**D**	**E**	**Protective Fence Height Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 6 In				If E = 1, then Include
1 Ft 0 In				If E = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given swimming pool protective fence minimum height is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Swimming Pool Protective Fence Height and the Minimum Height allowed [Building Design Swimming Pool Protective Fence Height ≥ Minimum Height], when B = 1.

SWIMMING POOL PATIO OR DECK MINIMUM SETBACK				
Minimum Setback	**B**	**D**	**E**	**Minimum Setback Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 6 In				If E = 1, then Include
1 Ft 0 In				If E = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given swimming pool patio or deck minimum setback is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Swimming Pool Patio or Deck Setback and the Minimum Setback allowed [Building Design Swimming Pool Patio or Deck Setback ≥ Minimum Setback], when B = 1.

6.9 Greenhouse

GREENHOUSE CONSTRUCTION					
	Options	**B**	**D**	**C**	**Construction Check**
1	Pipe frame covered with chain link fencing material and/or dark plastic screen.				If C = 1, then Include
2	Pipe frame covered with chain link facing material and/or dark green plastic screen on top of a masonry wall, provided such masonry wall does not exceed				If C = 1, then Include

	Maximum Height above Finished Grade.		
3	Pipe frame covered with galvanized metal.		If C = 1, then Include
4	Wood frame covered with plastic.		If C = 1, then Include
5	Wood frame covered with glass.		If C = 1, then Include
6	Metal frame covered with plastic, on top of a masonry wall, provided such masonry wall does not exceed Maximum Height above Finished Grade.		If C = 1, then Include
7	Metal frame covered with glass, on to of a masonry wall, provided such masonry wall does not exceed Maximum Height above Finished Grade.		If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given greenhouse construction option is either the prescribed one or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

GREEN HOUSE MASONRY WALL HEIGHT LIMITATION FOR OPTIONS 2, 6 AND 7

	Maximum HAFG	B	D	E	Masonry Wall Height Check
Option 2	0 Ft 0 In				If E = 1, then Include
	0 Ft 6 In				If E = 1, then Include
	1 Ft 0 In				If E = 1, then Include
	…	…	…	…	…
	20 Ft 0 In				If E = 1, then Include
Option 6	0 Ft 0 In				If E = 1, then Include
	0 Ft 6 In				If E = 1, then Include
	1 Ft 0 In				If E = 1, then Include
	…	…	…	…	…
	20 Ft 0 In				If E = 1, then Include
Option 7	0 Ft 0 In				If E = 1, then Include
	0 Ft 6 In				If E = 1, then Include
	1 Ft 0 In				If E = 1, then Include
	…	…	…	…	…
	20 Ft 0 In				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given greenhouse masonry wall maximum height is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Greenhouse Masonry Wall Height and the Maximum Height above Finished Grade "HAFG" allowed [Greenhouse Masonry Wall Height ≤ Maximum Height], when B = 1.

GREENHOUSE FOOTPRINT

Maximum Footprint	**B**	**D**	**E**	**Maximum Footprint Check**
0 SF				If E = 1, then Include
1 SF				If E = 1, then Include
2 SF				If E = 1, then Include
…	…	…	…	…
"*n*"				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum footprint is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Greenhouse Footprint and the Maximum Footprint allowed [Building Design Greenhouse Footprint ≤ Maximum Footprint], when B = 1.

GREENHOUSE WALLS HEIGHT

Maximum Height	**B**	**D**	**E**	**Maximum Height Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 6 In				If E = 1, then Include
1 Ft 0 In				If E = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum greenhouse wall height is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Greenhouse Wall Height and the Maximum Height allowed [Building Design Greenhouse Wall Height ≤ Maximum Height], when B = 1.

GREENHOUSE OVERALL HEIGHT

Maximum Height	**B**	**D**	**E**	**Maximum Height Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 6 In				If E = 1, then Include
1 Ft 0 In				If E = 1, then Include
…	…	…	…	…
20 Ft 0 In				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum greenhouse overall height is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Greenhouse Overall Height and the Maximum Height allowed [Building Design Greenhouse Overall Height ≤ Maximum Height], when B = 1.

GREENHOUSE ROOF PITCH

Maximum Pitch	**B**	**D**	**E**	**Maximum Pitch Check**
3.0:12 OR 25%				If E = 1, then Include
3.5:12 OR 29%				If E = 1, then Include
4.0:12 OR 33%				If E = 1, then Include
…	…	…	…	…
12:12 OR 100%				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given maximum greenhouse roof pitch is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Greenhouse Roof Pitch and the Maximum Pitch allowed [Building Design Greenhouse Roof Pitch ≤ Maximum Pitch], when B = 1.

6.10 Colors

COLORS					
Colors		**B**	**D**	**C**	**Masonry Wall Height Check**
Roof	White				If C = 1, then Include
	Silver				If C = 1, then Include
	Orange				If C = 1, then Include
	Red				If C = 1, then Include
	…	…	…	…	…
	Black				If C = 1, then Include
Walls	White				If C = 1, then Include
	Blue				If C = 1, then Include
	Green				If C = 1, then Include
	Beige				If C = 1, then Include
	…	…	…	…	…
	Black				If C = 1, then Include
Shades	White				If C = 1, then Include
	Gray				If C = 1, then Include
	Beige				If C = 1, then Include
	Brown				If C = 1, then Include
	…	…	…	…	…
	Black				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given color is either the prescribed one or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

7 – Parking Calculations and Standards

7.1 Off-street Parking Requirements

OFF-STREET PARKING				
Parking Spaces	**MOP**	**D**	**E**	**Maximum Height Check**
0				If E = 1, then Include
1				If E = 1, then Include
2				If E = 1, then Include
…	…	…	…	…
1,000,000				If E = 1, then Include

Where:

MOP. Minimum Off-Street Parking requirement for any given Zoning Ordinance *_for the corresponding zoning district or transect zone_*, to be calculated.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Off-street Parking provided and the Parking Spaces identified as the minimum off-street parking "MOP" requirement [Building Design Off-street Parking ≥ Parking Spaces], when B = 1.

- Formula to calculate Minimum Off-street Parking requirement "MOP":

[(Building Design Floor Area)] / [(Minimum Off-street Parking Coefficient)*] = Minimum Off-street Parking "MOP"

* Minimum Off-street Parking Coefficient for selected principal use in the Program, and taken from the given Zoning Ordinance profile.

7.2 Parking Dimensions

PARKING DIMENSIONS					
Minimum Width		**B**	**D**	**E_1**	**Minimum Width Check**
Open Space	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	…	…	…	…	…
	12 Ft 0 In				If E_1 = 1, then Include
1-Car Garage	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	…	…	…	…	…
	12 Ft 0 In				If E_1 = 1, then Include
2-Car Garage	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	…	…	…	…	…
	24 Ft 0 In				If E_1 = 1, then Include
1-Car Carport	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	…	…	…	…	…
	12 Ft 0 In				If E_1 = 1, then Include
2-Car Carport	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	…	…	…	…	…
	24 Ft 0 In				If E_1 = 1, then Include
Minimum Length		**B**	**D**	**E_2**	**Minimum Length Check**
Open Space	0 Ft 0 In				If E_2 = 1, then Include

	0 Ft 6 In	If E_2 = 1, then Include
	1 Ft 0 In	If E_2 = 1, then Include
	1 Ft 6 In	If E_2 = 1, then Include
	… … … …	…
	24 Ft 0 In	If E_2 = 1, then Include
1-Car Compact	0 Ft 0 In	If E_2 = 1, then Include
	0 Ft 6 In	If E_2 = 1, then Include
	1 Ft 0 In	If E_2 = 1, then Include
	1 Ft 6 In	If E_2 = 1, then Include
	… … … …	…
	24 Ft 0 In	If E_2 = 1, then Include
2-Car Compact	0 Ft 0 In	If E_2 = 1, then Include
	0 Ft 6 In	If E_2 = 1, then Include
	1 Ft 0 In	If E_2 = 1, then Include
	1 Ft 6 In	If E_2 = 1, then Include
	… … … …	…
	24 Ft 0 In	If E_2 = 1, then Include
1-Car Compact	0 Ft 0 In	If E_2 = 1, then Include
	0 Ft 6 In	If E_2 = 1, then Include
	1 Ft 0 In	If E_2 = 1, then Include
	1 Ft 6 In	If E_2 = 1, then Include
	… … … …	…
	24 Ft 0 In	If E_2 = 1, then Include
2-Car Compact	0 Ft 0 In	If E_2 = 1, then Include
	0 Ft 6 In	If E_2 = 1, then Include
	1 Ft 0 In	If E_2 = 1, then Include
	1 Ft 6 In	If E_2 = 1, then Include
	… … … …	…
	24 Ft 0 In	If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum parking dimension is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between Building Design Parking Width and the Minimum Width required [Building Design Parking Width ≥ Minimum Width], when B = 1.

E_2. Reflexive relation between Building Design Parking Length and the Minimum Length required [Building Design Parking Length ≥ Minimum Length], when B = 1.

7.3 Driveway Dimensions

DRIVEWAY DIMENSIONS

	Maximum Dimension	B	D	E_1	Maximum Dimension Check
Vehicular entrance width	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	2 Ft 0 In				If E_1 = 1, then Include
	2 Ft 6 In				If E_1 = 1, then Include
	3 Ft 0 In				If E_1 = 1, then Include
	3 Ft 6 In				If E_1 = 1, then Include
	4 Ft 0 In				If E_1 = 1, then Include
	4 Ft 6 In				If E_1 = 1, then Include
	5 Ft 0 In				If E_2 = 1, then Include
	…	…	…	…	…
	100 Ft 0 In				If E_1 = 1, then Include
	Minimum Dimension	**B**	**D**	**E_2**	**Minimum Dimension Check**
Vehicular entrances separation	0 Ft 0 In				If E_2 = 1, then Include
	0 Ft 6 In				If E_2 = 1, then Include
	1 Ft 0 In				If E_2 = 1, then Include
	1 Ft 6 In				If E_2 = 1, then Include
	2 Ft 0 In				If E_2 = 1, then Include
	2 Ft 6 In				If E_2 = 1, then Include
	3 Ft 0 In				If E_2 = 1, then Include
	3 Ft 6 In				If E_2 = 1, then Include
	4 Ft 0 In				If E_2 = 1, then Include
	4 Ft 6 In				If E_2 = 1, then Include
	5 Ft 0 In				If E_2 = 1, then Include
	…	…	…	…	…
	100 Ft 0 In				If E_2 = 1, then Include
	Maximum Dimension	**B**	**D**	**E_3**	**Maximum Dimension Check**
Shared driveway width	0 Ft 0 In				If E_3 = 1, then Include
	0 Ft 6 In				If E_3 = 1, then Include
	1 Ft 0 In				If E_3 = 1, then Include
	1 Ft 6 In				If E_3 = 1, then Include
	2 Ft 0 In				If E_3 = 1, then Include
	2 Ft 6 In				If E_3 = 1, then Include
	3 Ft 0 In				If E_3 = 1, then Include
	3 Ft 6 In				If E_3 = 1, then Include
	4 Ft 0 In				If E_3 = 1, then Include
	4 Ft 6 In				If E_3 = 1, then Include
	5 Ft 0 In				If E_2 = 1, then Include
	…	…	…	…	…
	100 Ft 0 In				If E_3 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum driveway dimension is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between Building Design Vehicular Entrance Width and the Maximum (Width) Dimension required [Building Design Vehicular Entrance Width ≤ Maximum Dimension], when B = 1.

E_2. Reflexive relation between Building Design Vehicular Entrances Separation and the Minimum (Separation) Dimension required [Building Design Parking Length ≥ Minimum Dimension], when B = 1.

E_3. Reflexive relation between Building Design Shared Driveway Width and the Maximum (Width) Dimension required [Building Design Shared Driveway Width ≤ Maximum Dimension], when B = 1.

7.4 Parking and Driveway Setbacks

PARKING SETBACKS					
	Minimum Setback	**B**	**D**	**E**	**Minimum Setback Check**
Parallel to Property Line	0 Ft 0 In				If E = 1, then Include
	0 Ft 6 In				If E = 1, then Include
	1 Ft 0 In				If E = 1, then Include
	1 Ft 6 In				If E = 1, then Include
	2 Ft 0 In				If E = 1, then Include
	2 Ft 6 In				If E = 1, then Include
	3 Ft 0 In				If E = 1, then Include
	3 Ft 6 In				If E = 1, then Include
	4 Ft 0 In				If E = 1, then Include
	4 Ft 6 In				If E = 1, then Include
	...	...	...	...	...
	20 Ft 0 In				If E = 1, then Include
Perpendicular to Property Line	0 Ft 0 In				If E = 1, then Include
	0 Ft 6 In				If E = 1, then Include
	1 Ft 0 In				If E = 1, then Include
	1 Ft 6 In				If E = 1, then Include
	2 Ft 0 In				If E = 1, then Include
	2 Ft 6 In				If E = 1, then Include
	3 Ft 0 In				If E = 1, then Include
	3 Ft 6 In				If E = 1, then Include
	4 Ft 0 In				If E = 1, then Include
	4 Ft 6 In				If E = 1, then Include
	...	...	...	...	...
	20 Ft 0 In				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum parking setback is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Parking Setback and the Minimum Setback required [Building Design Parking Setback ≥ Minimum Setback], when B = 1.

DRIVEWAY SEPARATION FROM SIDE PROPERTY LINE				
Minimum Separation	**B**	**D**	**E**	**Minimum Separation Check**
0 Ft 0 In				If E = 1, then Include
0 Ft 6 In				If E = 1, then Include
1 Ft 0 In				If E = 1, then Include
1 Ft 6 In				If E = 1, then Include
...	...	...	...	...
20 Ft 0 In				If E = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum driveway separation from a side property line is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E. Reflexive relation between Building Design Driveway Separation and Minimum Separation required [Building Design Driveway Separation ≥ Minimum Separation], when B = 1.

7.5 Vision Clearance at Intersections

VISIBILITY TRIANGLE DIMENSIONS					
	Minimum Side Length	**B**	**D**	**E_1**	**Minimum Side Length Check**
Street – Street intersection	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	2 Ft 0 In				If E_1 = 1, then Include
	2 Ft 6 In				If E_1 = 1, then Include
	3 Ft 0 In				If E_1 = 1, then Include
	3 Ft 6 In				If E_1 = 1, then Include
	4 Ft 0 In				If E_1 = 1, then Include
	4 Ft 6 In				If E_1 = 1, then Include
	…	…	…	…	…
	25 Ft 0 In				If E_1 = 1, then Include
		B	**D**	**E_2**	
Street – Driveway intersection	0 Ft 0 In				If E_2 = 1, then Include
	0 Ft 6 In				If E_2 = 1, then Include
	1 Ft 0 In				If E_2 = 1, then Include
	1 Ft 6 In				If E_2 = 1, then Include
	2 Ft 0 In				If E_2 = 1, then Include
	2 Ft 6 In				If E_2 = 1, then Include
	3 Ft 0 In				If E_2 = 1, then Include
	3 Ft 6 In				If E_2 = 1, then Include
	4 Ft 0 In				If E_2 = 1, then Include
	4 Ft 6 In				If E_2 = 1, then Include
	…	…	…	…	…
	25 Ft 0 In				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum visibility triangle side length is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between Building Design Street-Street Visibility Triangle Side Length within Profile and the Minimum Side Length required [Building Design Street-Street Visibility Triangle Side Length ≥ Minimum Side Length], when B = 1.

E_2. Reflexive relation between Building Design Street-Driveway Visibility Triangle Side Length within Profile and the Minimum Side Length required [Building Design Street-Driveway Visibility Triangle Side Length ≥ Minimum Side Length], when B = 1.

7.6 Parking and Garage Location within Building Site

PARKING AND GARAGE LOCATION WITHIN BUILDING SITE					
Location		**B**	**D**	**C**	**Minimum Width Check**
Open parking spaces	First Layer				If C = 1, then Include
	Second Layer				If C = 1, then Include

	Third Layer	If C = 1, then Include
Garages	First Layer	If C = 1, then Include
	Second Layer	If C = 1, then Include
	Third Layer	If C = 1, then Include
Parking structures	First Layer	If C = 1, then Include
	Second Layer	If C = 1, then Include
	Third Layer	If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given location is either the prescribed one or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

OFF-STREET PARKING BACKING INTO STREET				
	B	**D**	**C**	**Materials Check**
Permitted				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which off-street parking backing into a Street is either allowed or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

BICYCLE RACKS				
Minimum Count	**B**	**D**	**C**	**Materials Check**
1				If C = 1, then Include
2				If C = 1, then Include
…	…	…	…	…
100				If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which minimum bicycle rack count is either the prescribed one or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

7.7 Parking Area Pavement Materials

PARKING AND DRIVEWAY PAVEMENT MATERIALS				
	B	**D**	**C**	**Materials Check**
Asphaltic concrete				If C = 1, then Include
Reinforced concrete				If C = 1, then Include
Concrete pavers				If C = 1, then Include
Grass-crete or similar				If C = 1, then Include
Clay or cement bricks				If C = 1, then Include

Wood blocks	If C = 1, then Include
Gravel laid on asphalt	If C = 1, then Include
Loose gravel	If C = 1, then Include
Other	If C = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which minimum bicycle rack count is either the prescribed one or not.

D. Profile of Building Design to evaluate.

C. Logical conjunction of B and D, also represented as (B ∧D).

8 – Loading Standards

8.1 Loading Berth Dimensions

LOADING BERTH DIMENSIONS					
Minimum Dimension		**B**	**D**	**E_1**	**Minimum Dimension Check**
Width	0 Ft 0 In				If E_1 = 1, then Include
	0 Ft 6 In				If E_1 = 1, then Include
	1 Ft 0 In				If E_1 = 1, then Include
	1 Ft 6 In				If E_1 = 1, then Include
	…	…	…	…	…
	12 Ft 0 In				If E_1 = 1, then Include
Minimum Dimension		**B**	**D**	**E_2**	**Minimum Dimension Check**
Length	0 Ft 0 In				If E_2 = 1, then Include
	0 Ft 6 In				If E_2 = 1, then Include
	1 Ft 0 In				If E_2 = 1, then Include
	1 Ft 6 In				If E_2 = 1, then Include
	…	…	…	…	…
	12 Ft 0 In				If E_2 = 1, then Include

Where:

B. Specific condition entailed by profile of specific Zoning Ordinance, in which any given minimum loading berth dimension is either the prescribed one or not.

D. Profile of Building Design to evaluate.

E_1. Reflexive relation between Building Design Loading Berth Width within Profile and the Minimum (Width) Dimension required [Building Design Loading Berth Width ≥ Minimum Dimension], when B = 1.

E_2. Reflexive relation between Building Design Loading Berth Length within Profile and the Minimum (Length) Dimension required [Building Design Loading Berth Length ≥ Minimum Dimension], when B = 1.

8.2 Required Number of Loading Berths

LOADING BERTH NUMBER				
Loading Berths	**MLB**	**D**	**E**	**Minimum Loading Berth Count Check**
0				If E = 1, then Include
1				If E = 1, then Include
2				If E = 1, then Include
…	…	…	…	…
100				If E = 1, then Include

Where:

MLB. Minimum Loading Berth count requirement for any given Zoning Ordinance *_for the corresponding zoning district or transect zone_*, to be calculated.
D. Profile of Building Design to evaluate.
E. Reflexive relation between Building Design Off-street Parking provided and the Parking Spaces identified as the minimum off-street parking "MOP" requirement [Building Design Off-street Parking ≥ Parking Spaces], when B = 1.

- Formula to calculate Minimum Loading Berth count requirement "MLB":

[(Building Design Floor Area)] / [(Minimum Loading Berth Coefficient)*] =
Minimum Off-street Parking "MOP"

* Minimum Loading Berth Coefficient for selected principal use in the Program, and taken from the given Zoning Ordinance profile.

WHAT IS CLAIMED:

1. A computer-implemented method for generating building designs, comprising:

collecting by a computer building design data including building specific data and site specific data;

generating by the computer at least one building design candidate compatible with the collected building design data; and

upon approval of one of said at least one building design candidates, generating by the computer a final set of construction documents for it.

2. The method of claim 1, wherein the building specific data comprises one or more of a building type, an architecture type and/or style, a construction system, a construction budget range, and an environmental response standard.

3. The method of claim 1, wherein the site specific data comprises one or more of a site address, zoning description, legal description, and a physical description of the site.

4. The method of claim 1, wherein collecting the building design data comprises:

gathering by the computer the site specific data;

presenting by the computer a selection of building types compatible with the site specific data;

upon receipt of a selection of a building type by the computer, presenting a selections of spaces to be included in the building; and

determining by the computer a construction system based on the site specific data and the selecting building type.

presenting by the computer a selection of architectural styles compatible with the building and site specific data;

5. The method of claim 4, further comprising, presenting a selection of environmental standards.

6. The method of claim 1, wherein generating at least one building design candidate comprises:

generating an array of variables that define a building design based on the building design data.

7. The method of claim 1, wherein the at least one building design candidate comprises one or more of diagrams, pictures, video, and written narrative, the building design candidate describing characteristics of the building and a preliminary cost estimate.

8. The method of claim 1, wherein the final construction documents set comprises working drawings, specifications, and a final cost estimate.

9. The method of claim 1, wherein collecting the building design data comprises retrieving data from one or more internal or external databases.

10. The method of claim 1, further comprising:

presenting a graphical rendering of the at least one building design candidate.

11. The method of claim 10, wherein the graphical rendering comprises a virtual tour of the at least one building design.

12. The method of claim 10, wherein the graphical rendering illustrates the at least one design candidate within in the context of the surrounding neighborhood.

13. The method of claim 1, wherein the site specific data comprises zoning data, and wherein collecting the site specific data comprises searching a database for a zoning ordinance applicable to the site,

wherein when a zoning ordinance cannot be located, a zoning questionnaire is presented to a user to obtain zoning information.

14. The method of claim1, wherein generating the at least one building design candidate comprises:

searching at least one database of building designs for one or more building design candidates compatible with the building design data.

15. The method of claim 14, further comprising, for each building design candidate, computing an estimated construction cost.

16. The method of claim 10, further comprising:

receiving a request to edit at least one component of the design after presenting the graphical rendering; and

generating a new graphical rendering reflecting the requested edit.

17. The method of claim 10, wherein the graphical rendering illustrates the at least one design candidate within the context of the surrounding neighborhood.

18. A building design system for generating building designs, the system comprising:

a building design data collector unit that collects building design data including building specific data and site specific data;

a building design determiner unit that identifies at least one building design candidate compatible with the collected building design data; and

a building design generator unit that, upon approval of one of said at least one building design candidates by the building design determiner, generates a final set of construction documents for the design.

19. The system of claim 18, wherein the building design collector is configured to:

gather site specific data;

present a selection of building types compatible with the site specific data;

upon receipt of a selection of a building type, present a selections of spaces to be included in the building; and

determine a construction system based on the site specific data and the selected building type.

identify and present a selection of architectural styles among which to choose the one to be featured in the building.

20. The system of claim 18, further comprising:

an environmental standards presenter unit that presents a selection of environmental standards.

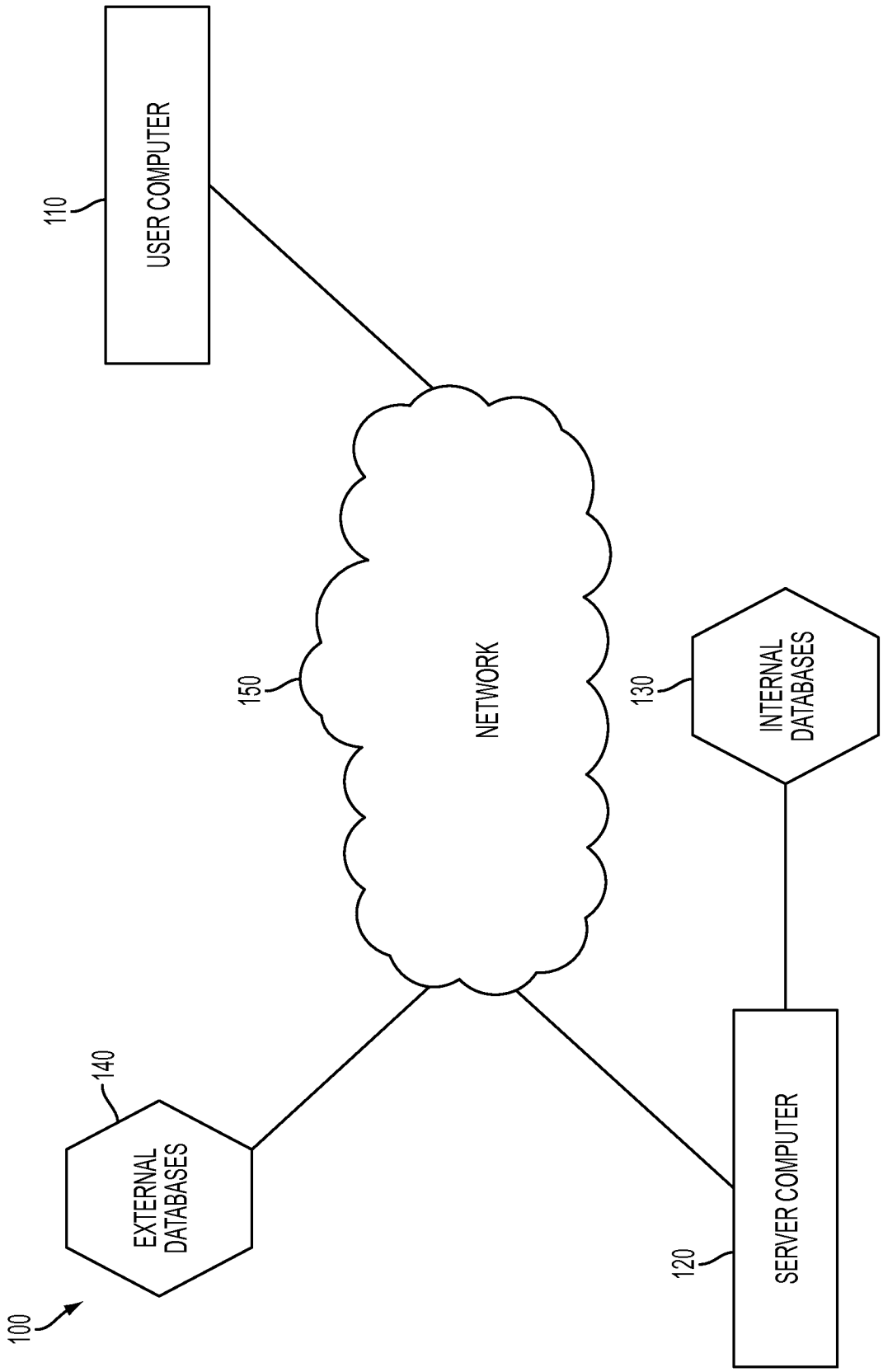
USER COMPUTER
110
NETWORK
150
INTERNAL DATABASES
130
EXTERNAL DATABASES
140
SERVER COMPUTER
120
100

FIG. 1

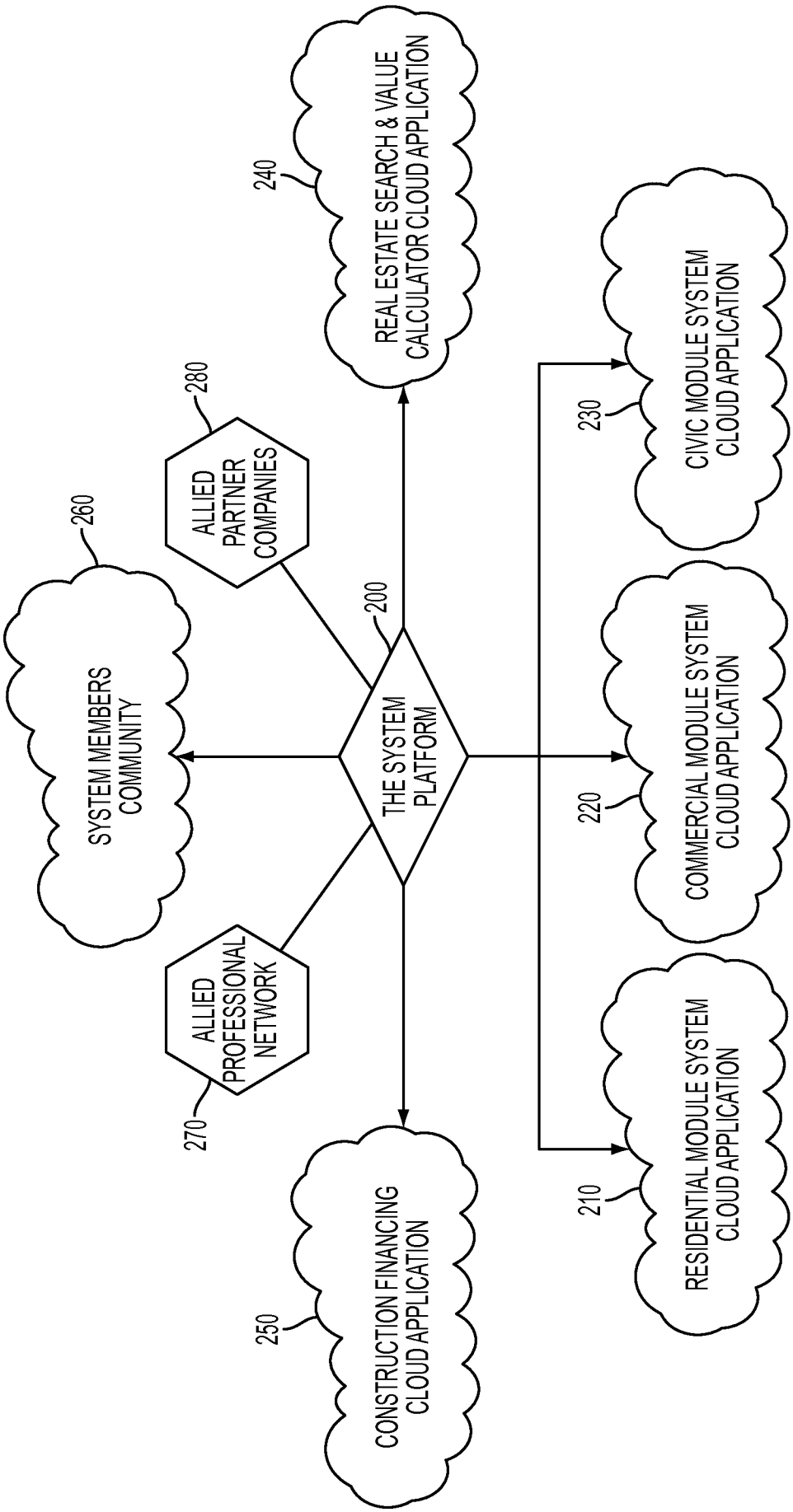
THE SYSTEM PLATFORM
200
SYSTEM MEMBERS COMMUNITY
260
ALLIED PARTNER COMPANIES
280
ALLIED PROFESSIONAL NETWORK
270
REAL ESTATE SEARCH & VALUE CALCULATOR CLOUD APPLICATION
240
CIVIC MODULE SYSTEM CLOUD APPLICATION
230
COMMERCIAL MODULE SYSTEM CLOUD APPLICATION
220
RESIDENTIAL MODULE SYSTEM CLOUD APPLICATION
210
CONSTRUCTION FINANCING CLOUD APPLICATION
250

FIG. 2

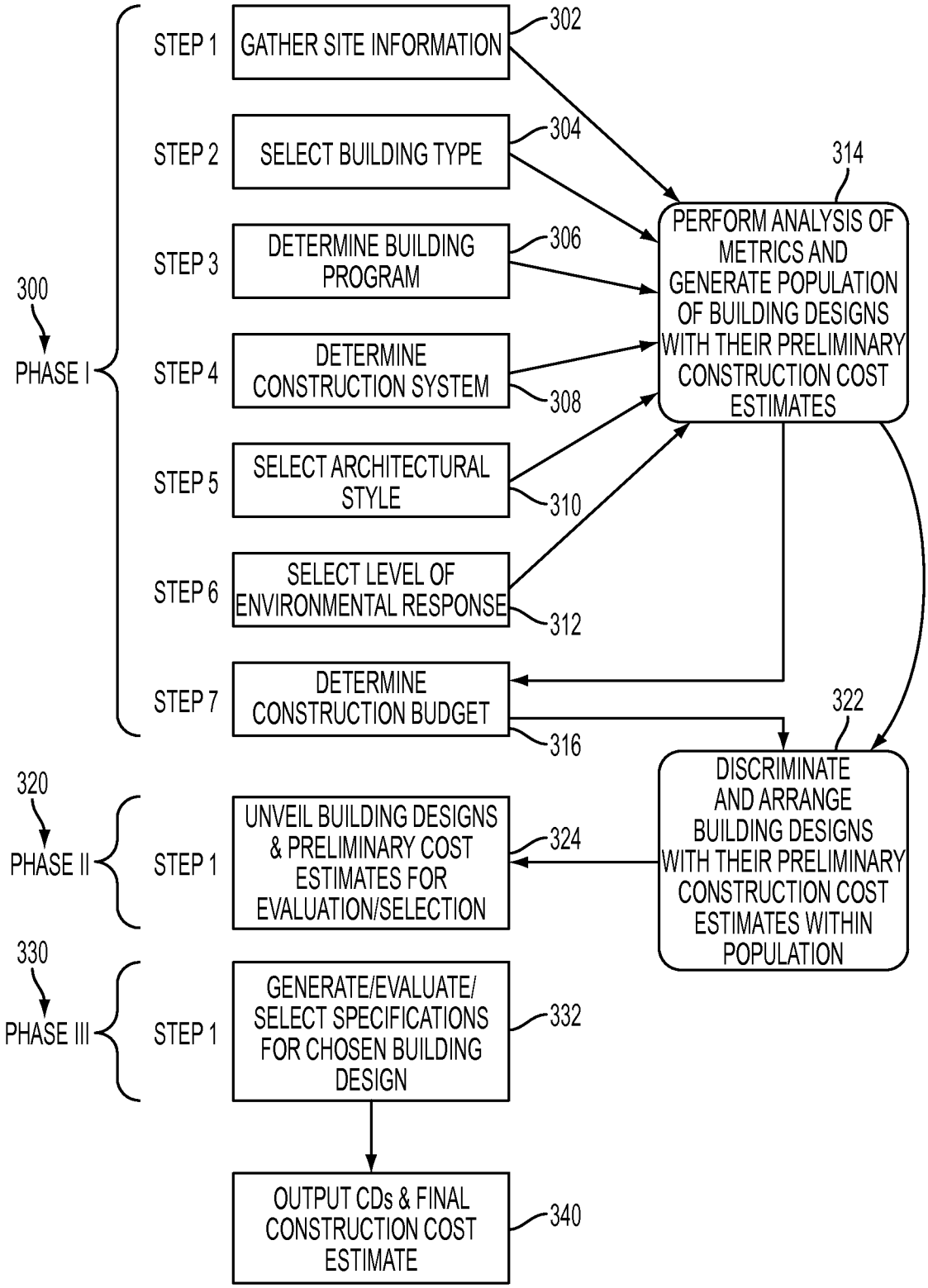
300
PHASE I
STEP 1
GATHER SITE INFORMATION
302
STEP 2
SELECT BUILDING TYPE
304
STEP 3
DETERMINE BUILDING PROGRAM
306
STEP 4
DETERMINE CONSTRUCTION SYSTEM
308
STEP 5
SELECT ARCHITECTURAL STYLE
310
STEP 6
SELECT LEVEL OF ENVIRONMENTAL RESPONSE
312
STEP 7
DETERMINE CONSTRUCTION BUDGET
316
314
PERFORM ANALYSIS OF METRICS AND GENERATE POPULATION OF BUILDING DESIGNS WITH THEIR PRELIMINARY CONSTRUCTION COST ESTIMATES
322
DISCRIMINATE AND ARRANGE BUILDING DESIGNS WITH THEIR PRELIMINARY CONSTRUCTION COST ESTIMATES WITHIN POPULATION
320
PHASE II
STEP 1
UNVEIL BUILDING DESIGNS & PRELIMINARY COST ESTIMATES FOR EVALUATION/SELECTION
324
330
PHASE III
STEP 1
GENERATE/EVALUATE/ SELECT SPECIFICATIONS FOR CHOSEN BUILDING DESIGN
332
OUTPUT CDs & FINAL CONSTRUCTION COST ESTIMATE
340

FIG. 3

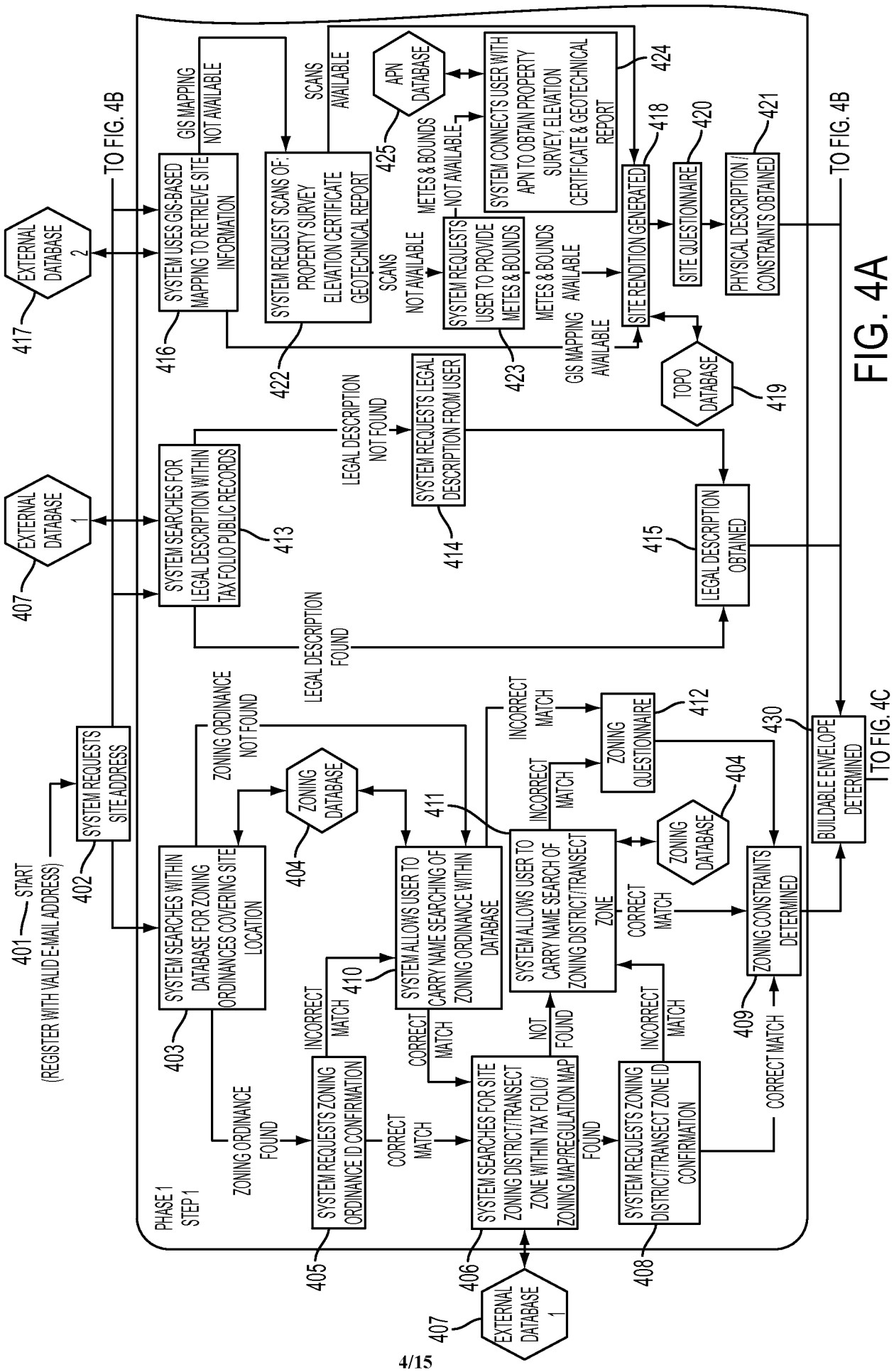
PHASE 1
STEP 1
401 START
(REGISTER WITH VALID E-MAIL ADDRESS)
SYSTEM REQUESTS SITE ADDRESS
402
SYSTEM SEARCHES WITHIN DATABASE FOR ZONING ORDINANCES COVERING SITE LOCATION
403
ZONING ORDINANCE FOUND
ZONING ORDINANCE NOT FOUND
ZONING DATABASE
404
SYSTEM REQUESTS ZONING ORDINANCE ID CONFIRMATION
405
INCORRECT MATCH
CORRECT MATCH
SYSTEM ALLOWS USER TO CARRY NAME SEARCHING OF ZONING ORDINANCE WITHIN DATABASE
410
SYSTEM SEARCHES FOR SITE ZONING DISTRICT/TRANSECT ZONE WITHIN TAX FOLIO/ ZONING MAP/REGULATION MAP
406
NOT FOUND
FOUND
EXTERNAL DATABASE 1
407
SYSTEM ALLOWS USER TO CARRY NAME SEARCH OF ZONING DISTRICT/TRANSECT ZONE
411
INCORRECT MATCH
CORRECT MATCH
ZONING QUESTIONNAIRE
412
SYSTEM REQUESTS ZONING DISTRICT/TRANSECT ZONE ID CONFIRMATION
408
INCORRECT MATCH
CORRECT MATCH
ZONING CONSTRAINTS DETERMINED
409
BUILDABLE ENVELOPE DETERMINED
430
TO FIG. 4C
SYSTEM SEARCHES FOR LEGAL DESCRIPTION WITHIN TAX FOLIO PUBLIC RECORDS
413
LEGAL DESCRIPTION FOUND
LEGAL DESCRIPTION NOT FOUND
SYSTEM REQUESTS LEGAL DESCRIPTION FROM USER
414
LEGAL DESCRIPTION OBTAINED
415
SYSTEM USES GIS-BASED MAPPING TO RETRIEVE SITE INFORMATION
416
GIS MAPPING NOT AVAILABLE
SYSTEM REQUEST SCANS OF: PROPERTY SURVEY ELEVATION CERTIFICATE GEOTECHNICAL REPORT
422
SCANS AVAILABLE
SCANS NOT AVAILABLE
SYSTEM REQUESTS USER TO PROVIDE METES & BOUNDS
423
METES & BOUNDS AVAILABLE
METES & BOUNDS NOT AVAILABLE
APN DATABASE
425
SYSTEM CONNECTS USER WITH APN TO OBTAIN PROPERTY SURVEY, ELEVATION CERTIFICATE & GEOTECHNICAL REPORT
424
SITE RENDITION GENERATED
418
GIS MAPPING AVAILABLE
TOPO DATABASE
419
SITE QUESTIONNAIRE
420
PHYSICAL DESCRIPTION / CONSTRAINTS OBTAINED
421
TO FIG. 4B
EXTERNAL DATABASE 2
417
EXTERNAL DATABASE 1
407

FIG. 4A

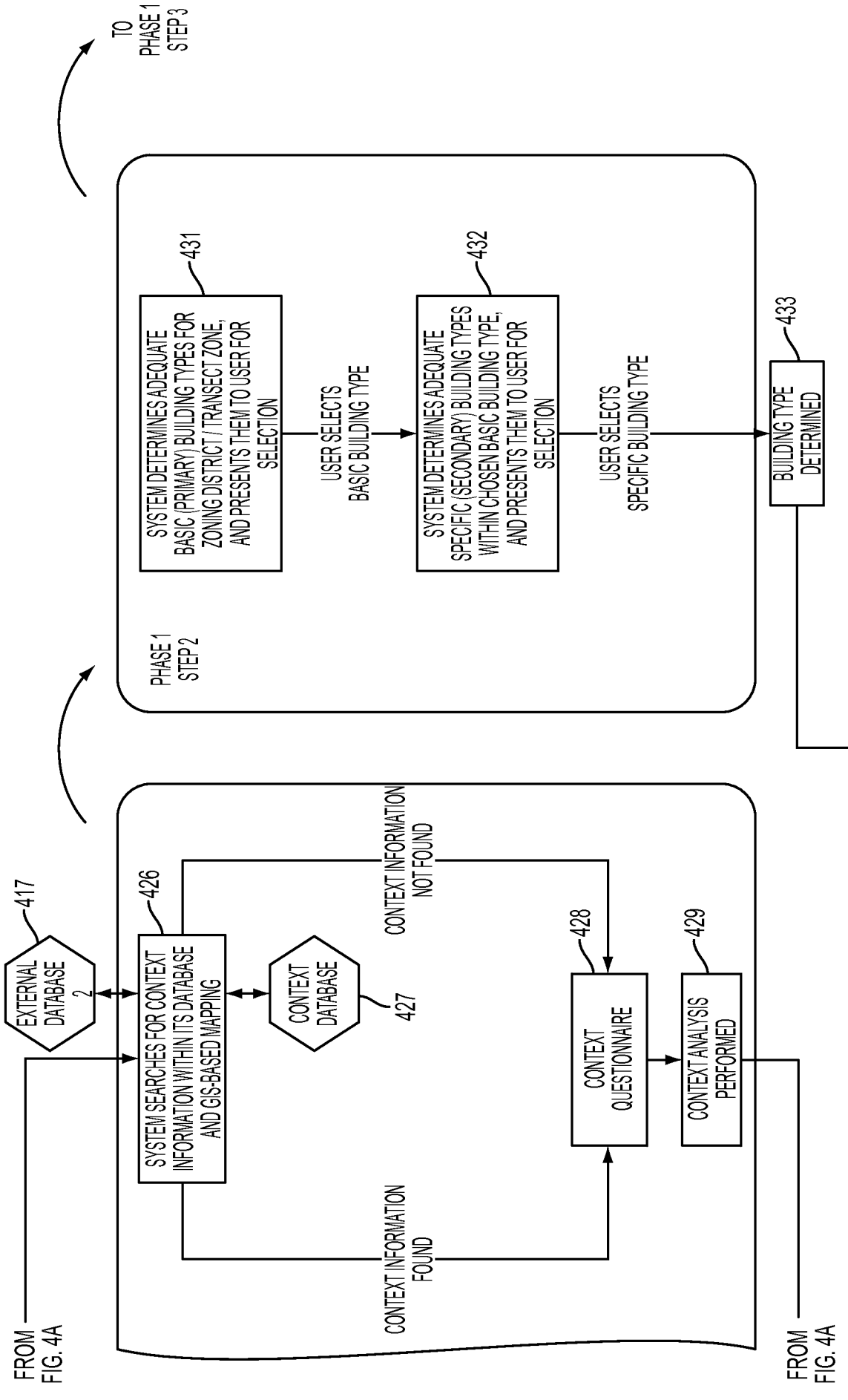
TO PHASE 1 STEP 3
PHASE 1 STEP 2
431
SYSTEM DETERMINES ADEQUATE BASIC (PRIMARY) BUILDING TYPES FOR ZONING DISTRICT / TRANSECT ZONE, AND PRESENTS THEM TO USER FOR SELECTION
USER SELECTS BASIC BUILDING TYPE
432
SYSTEM DETERMINES ADEQUATE SPECIFIC (SECONDARY) BUILDING TYPES WITHIN CHOSEN BASIC BUILDING TYPE, AND PRESENTS THEM TO USER FOR SELECTION
USER SELECTS SPECIFIC BUILDING TYPE
433
BUILDING TYPE DETERMINED
TO FIG. 4D
FROM FIG. 4A
417
EXTERNAL DATABASE 2
426
SYSTEM SEARCHES FOR CONTEXT INFORMATION WITHIN ITS DATABASE AND GIS-BASED MAPPING
CONTEXT DATABASE
427
CONTEXT INFORMATION NOT FOUND
CONTEXT INFORMATION FOUND
428
CONTEXT QUESTIONNAIRE
429
CONTEXT ANALYSIS PERFORMED
FROM FIG. 4A

FIG. 4B

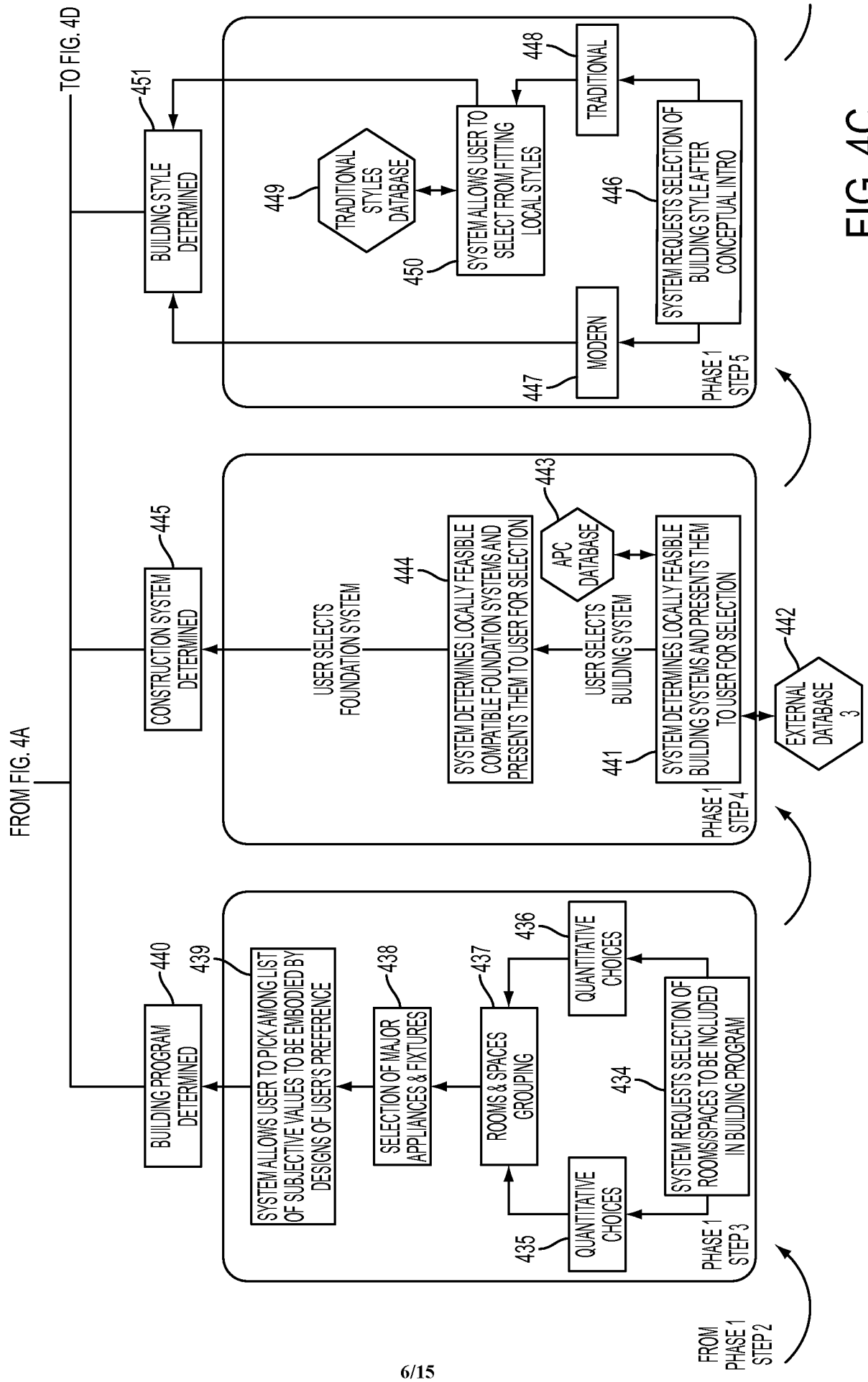
FROM FIG. 4A
TO FIG. 4D
FROM PHASE 1 STEP 2
PHASE 1 STEP 3
BUILDING PROGRAM DETERMINED
440
SYSTEM ALLOWS USER TO PICK AMONG LIST OF SUBJECTIVE VALUES TO BE EMBODIED BY DESIGNS OF USER'S PREFERENCE
439
SELECTION OF MAJOR APPLIANCES & FIXTURES
438
ROOMS & SPACES GROUPING
437
QUANTITATIVE CHOICES
436
QUANTITATIVE CHOICES
435
SYSTEM REQUESTS SELECTION OF ROOMS/SPACES TO BE INCLUDED IN BUILDING PROGRAM
434
PHASE 1 STEP 4
CONSTRUCTION SYSTEM DETERMINED
445
USER SELECTS FOUNDATION SYSTEM
SYSTEM DETERMINES LOCALLY FEASIBLE COMPATIBLE FOUNDATION SYSTEMS AND PRESENTS THEM TO USER FOR SELECTION
444
APC DATABASE
443
USER SELECTS BUILDING SYSTEM
SYSTEM DETERMINES LOCALLY FEASIBLE BUILDING SYSTEMS AND PRESENTS THEM TO USER FOR SELECTION
441
EXTERNAL DATABASE 3
442
PHASE 1 STEP 5
BUILDING STYLE DETERMINED
451
TRADITIONAL STYLES DATABASE
449
SYSTEM ALLOWS USER TO SELECT FROM FITTING LOCAL STYLES
450
TRADITIONAL
448
MODERN
447
SYSTEM REQUESTS SELECTION OF BUILDING STYLE AFTER CONCEPTUAL INTRO
446

FIG. 4C

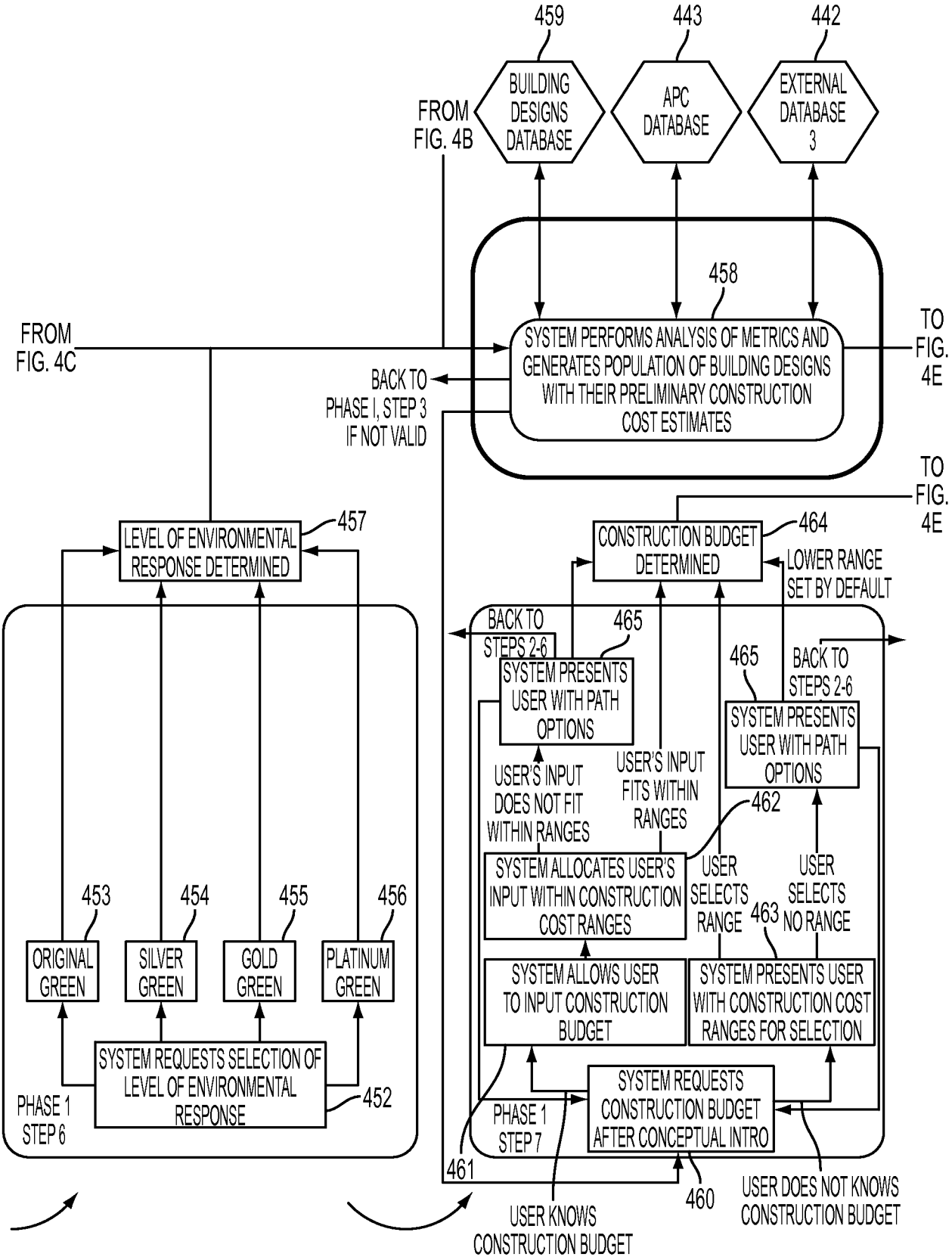
459
443
442
BUILDING DESIGNS DATABASE
APC DATABASE
EXTERNAL DATABASE 3
FROM FIG. 4B
458
FROM FIG. 4C
SYSTEM PERFORMS ANALYSIS OF METRICS AND GENERATES POPULATION OF BUILDING DESIGNS WITH THEIR PRELIMINARY CONSTRUCTION COST ESTIMATES
TO FIG. 4E
BACK TO PHASE I, STEP 3 IF NOT VALID
TO FIG. 4E
457
LEVEL OF ENVIRONMENTAL RESPONSE DETERMINED
464
CONSTRUCTION BUDGET DETERMINED
LOWER RANGE SET BY DEFAULT
BACK TO STEPS 2-6
465
SYSTEM PRESENTS USER WITH PATH OPTIONS
465
BACK TO STEPS 2-6
SYSTEM PRESENTS USER WITH PATH OPTIONS
USER'S INPUT DOES NOT FIT WITHIN RANGES
USER'S INPUT FITS WITHIN RANGES
462
SYSTEM ALLOCATES USER'S INPUT WITHIN CONSTRUCTION COST RANGES
USER SELECTS RANGE
USER SELECTS NO RANGE
463
453
454
455
456
ORIGINAL GREEN
SILVER GREEN
GOLD GREEN
PLATINUM GREEN
SYSTEM ALLOWS USER TO INPUT CONSTRUCTION BUDGET
SYSTEM PRESENTS USER WITH CONSTRUCTION COST RANGES FOR SELECTION
SYSTEM REQUESTS SELECTION OF LEVEL OF ENVIRONMENTAL RESPONSE
452
SYSTEM REQUESTS CONSTRUCTION BUDGET AFTER CONCEPTUAL INTRO
PHASE 1 STEP 6
PHASE 1 STEP 7
461
460
USER KNOWS CONSTRUCTION BUDGET
USER DOES NOT KNOWS CONSTRUCTION BUDGET

FIG. 4D

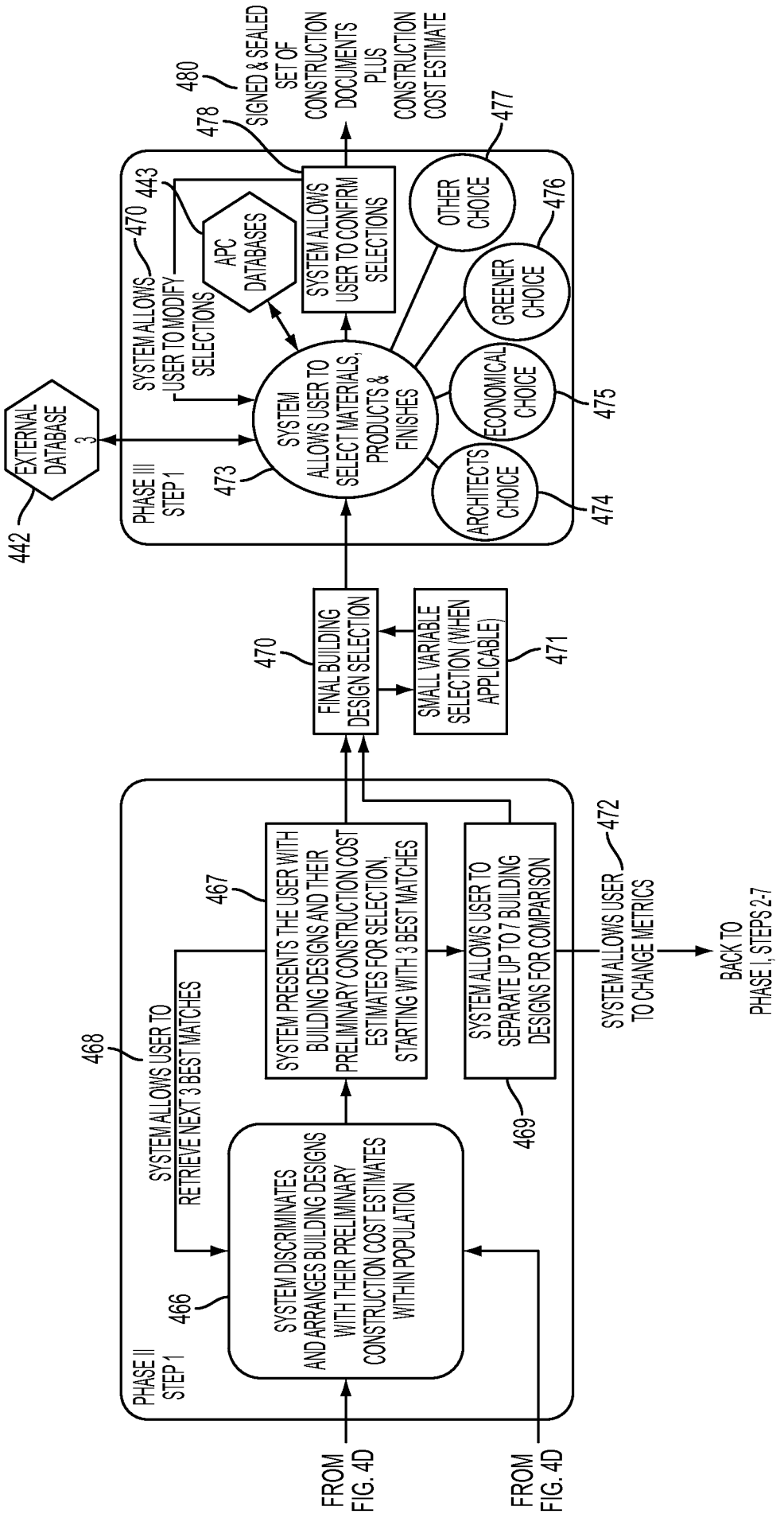
FROM FIG. 4D
FROM FIG. 4D
PHASE II STEP 1
466
SYSTEM DISCRIMINATES AND ARRANGES BUILDING DESIGNS WITH THEIR PRELIMINARY CONSTRUCTION COST ESTIMATES WITHIN POPULATION
468
SYSTEM ALLOWS USER TO RETRIEVE NEXT 3 BEST MATCHES
467
SYSTEM PRESENTS THE USER WITH BUILDING DESIGNS AND THEIR PRELIMINARY CONSTRUCTION COST ESTIMATES FOR SELECTION, STARTING WITH 3 BEST MATCHES
469
SYSTEM ALLOWS USER TO SEPARATE UP TO 7 BUILDING DESIGNS FOR COMPARISON
472
SYSTEM ALLOWS USER TO CHANGE METRICS
BACK TO PHASE I, STEPS 2-7
470
FINAL BUILDING DESIGN SELECTION
SMALL VARIABLE SELECTION (WHEN APPLICABLE)
471
442
EXTERNAL DATABASE 3
PHASE III STEP 1
473
SYSTEM ALLOWS USER TO SELECT MATERIALS, PRODUCTS & FINISHES
ARCHITECTS CHOICE
474
ECONOMICAL CHOICE
475
GREENER CHOICE
476
OTHER CHOICE
477
470
SYSTEM ALLOWS USER TO MODIFY SELECTIONS
443
APC DATABASES
478
SYSTEM ALLOWS USER TO CONFIRM SELECTIONS
480
SIGNED & SEALED SET OF CONSTRUCTION DOCUMENTS PLUS CONSTRUCTION COST ESTIMATE

FIG. 4E

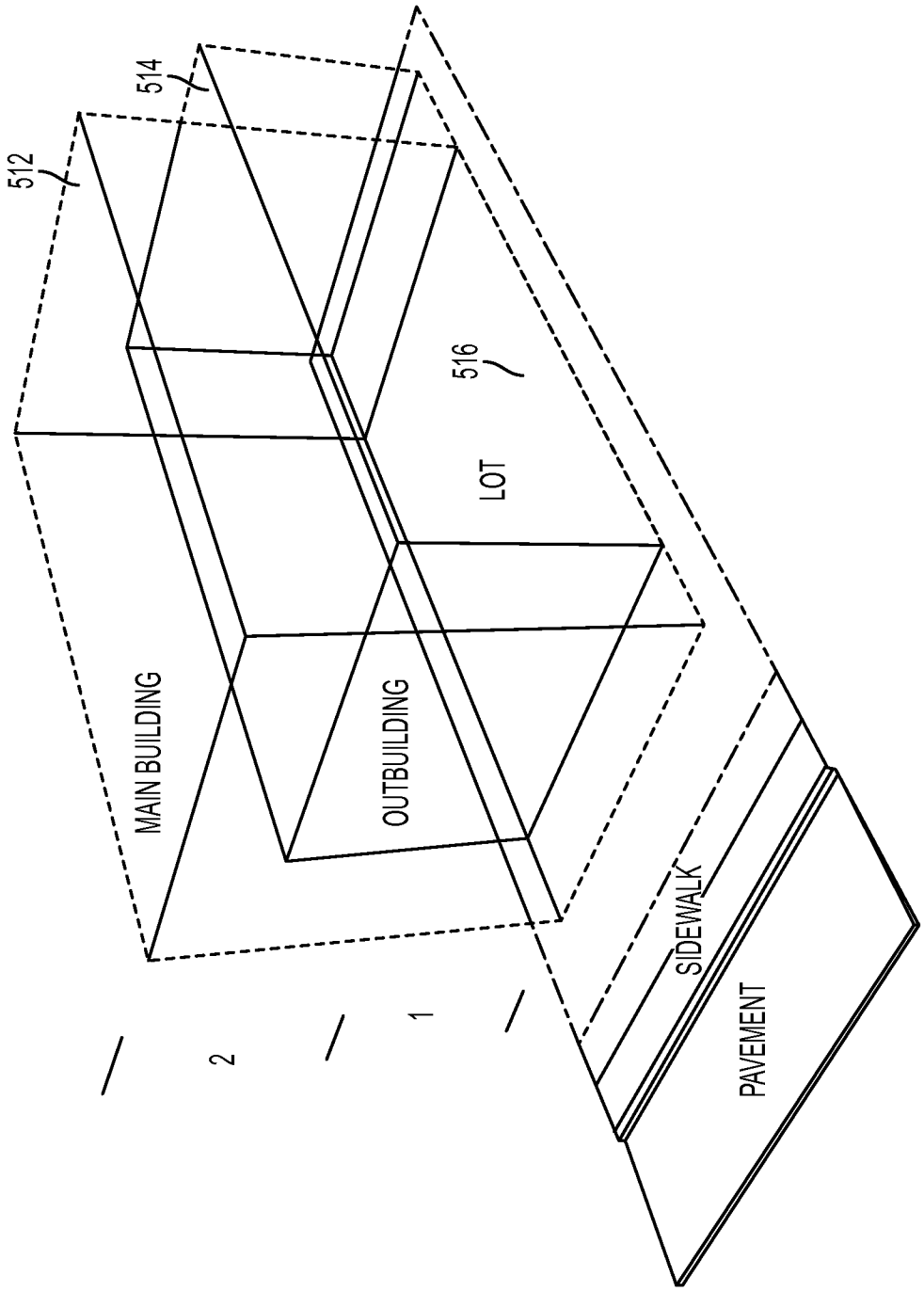
512
514
516
LOT
MAIN BUILDING
OUTBUILDING
SIDEWALK
PAVEMENT
2
1

FIG. 5A

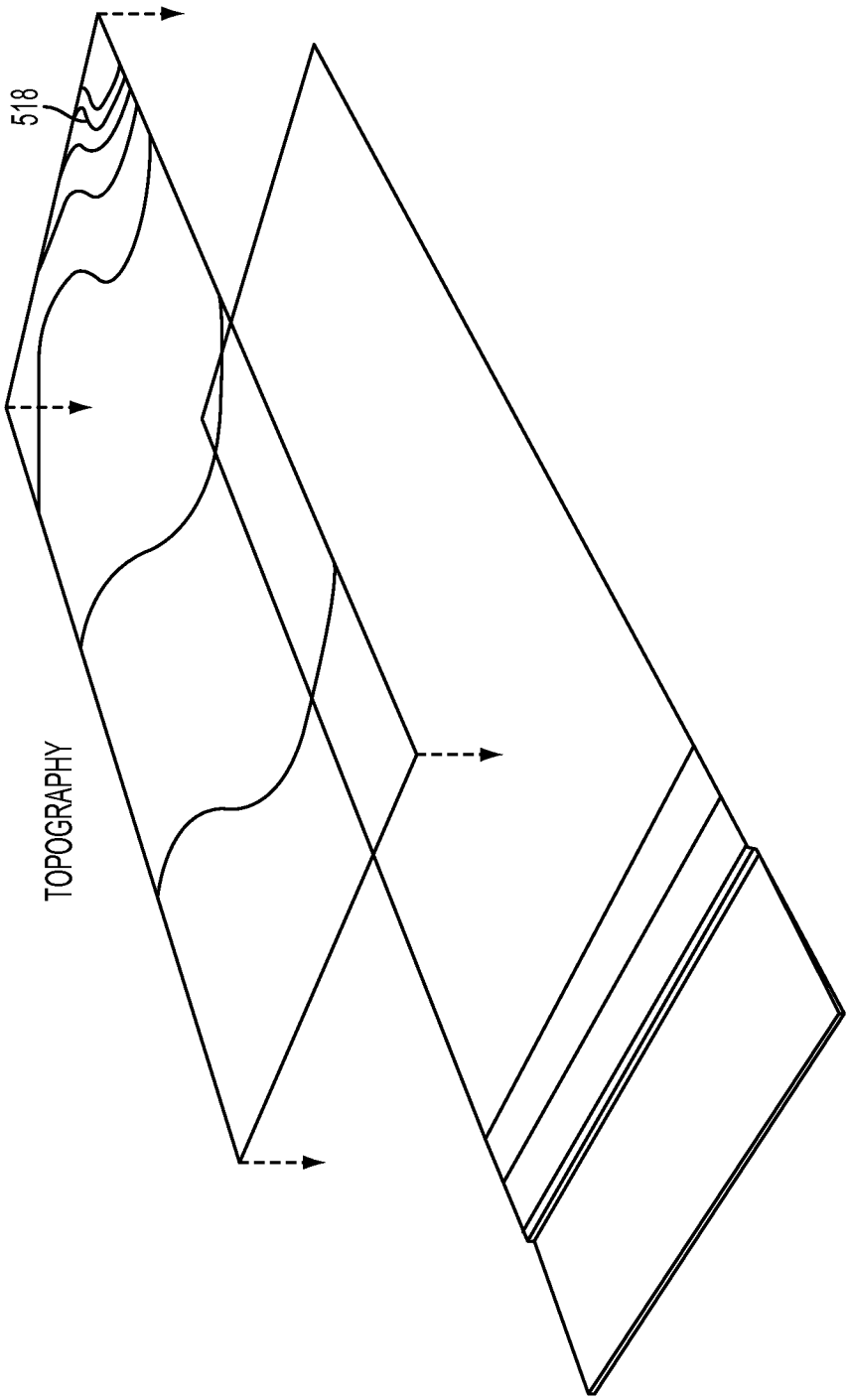

FIG. 5B

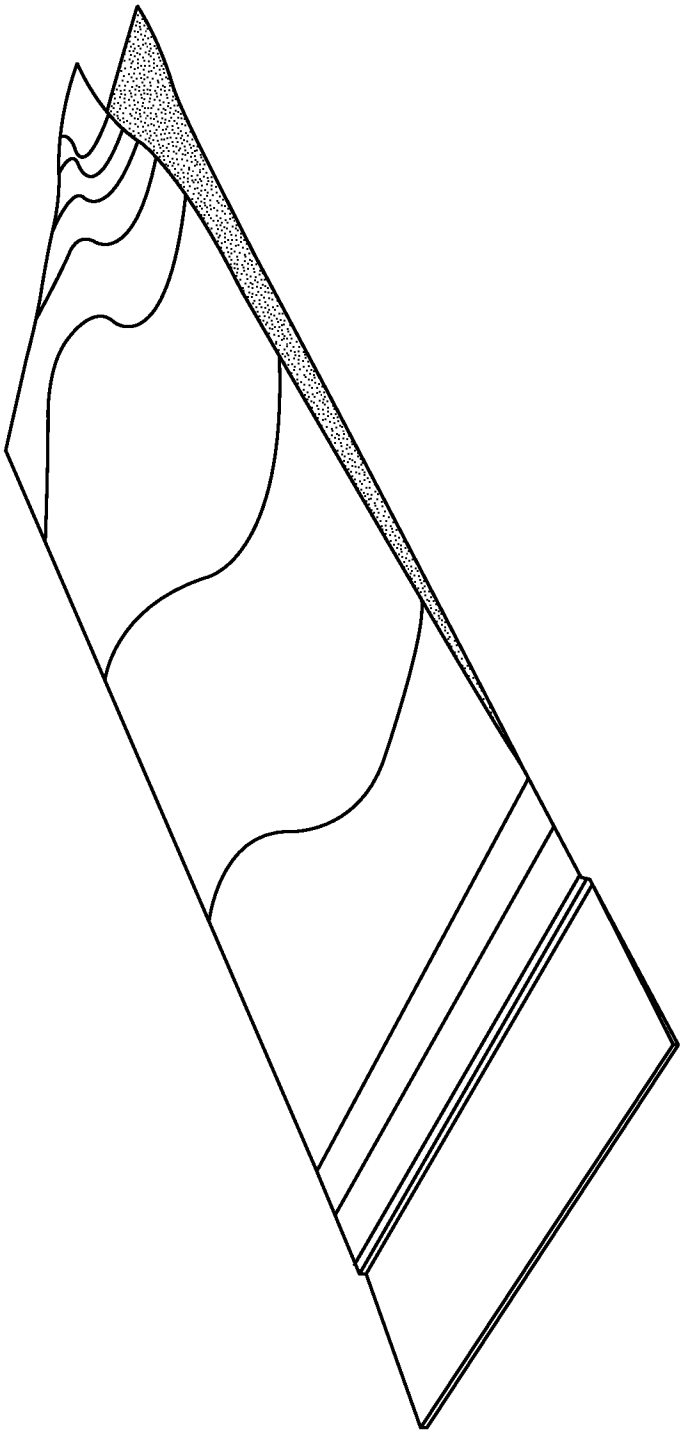

FIG. 5C

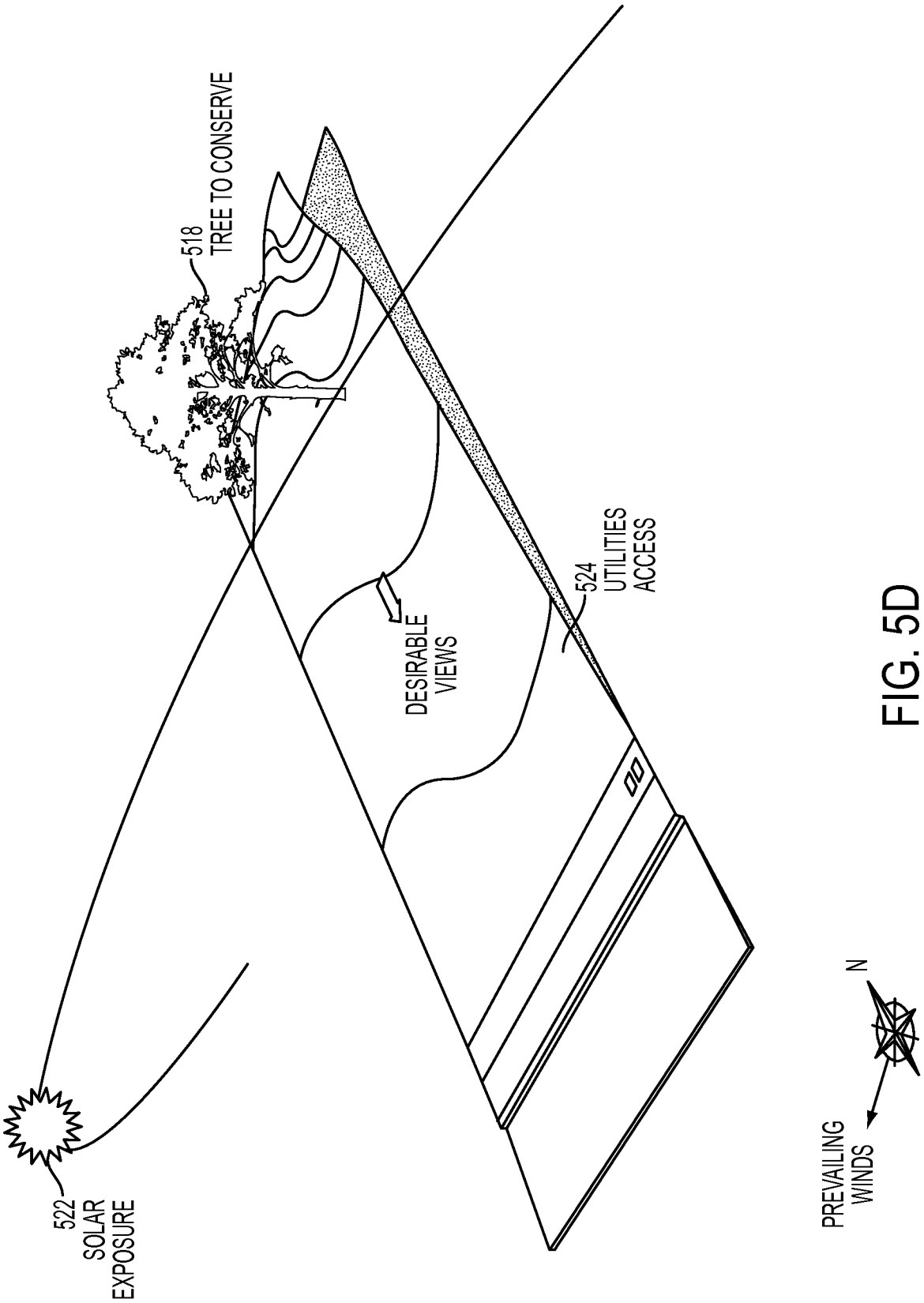
518
TREE TO CONSERVE
DESIRABLE VIEWS
524
UTILITIES ACCESS
522
SOLAR EXPOSURE
N
PREVAILING WINDS

FIG. 5D

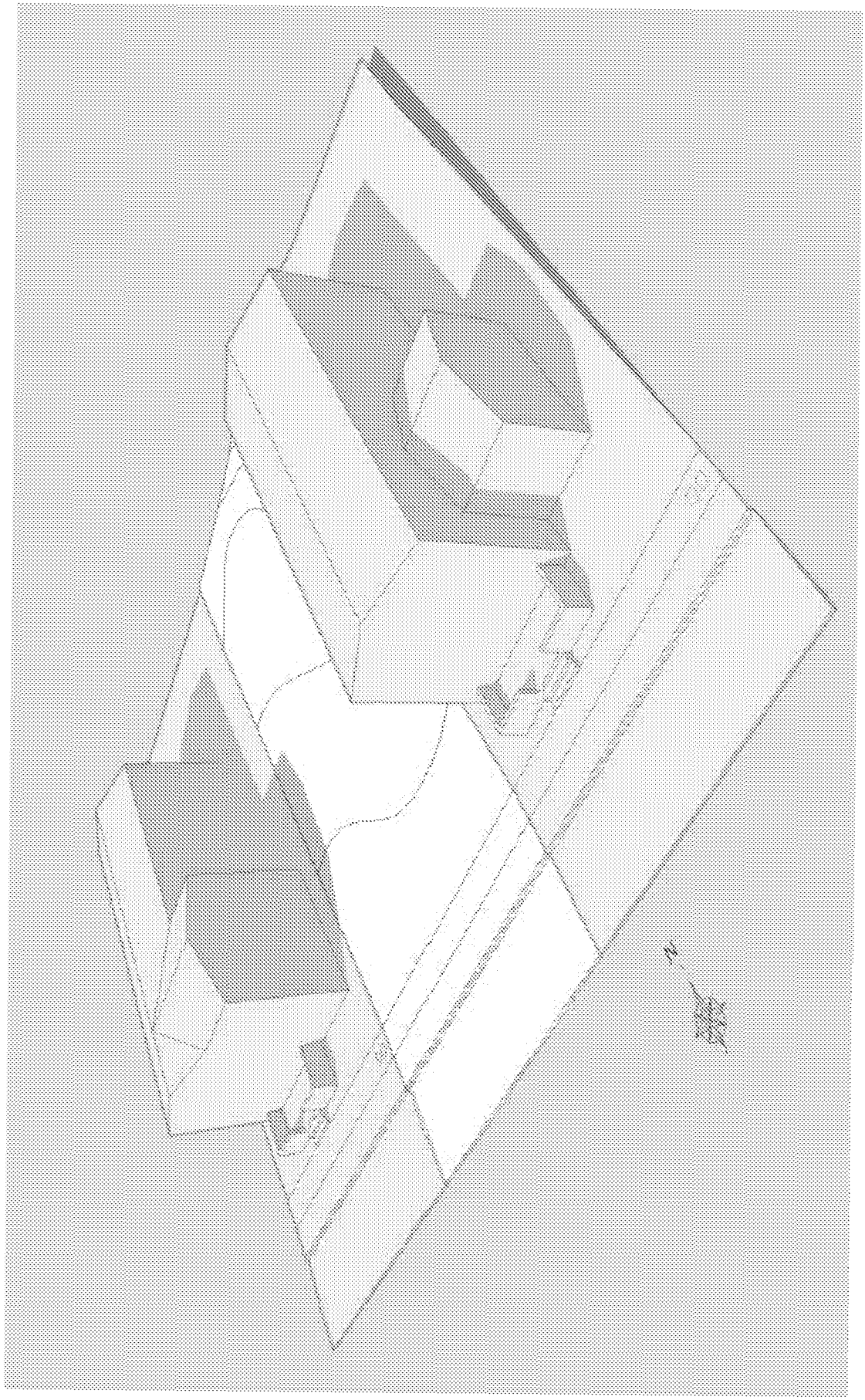

FIG. 5E

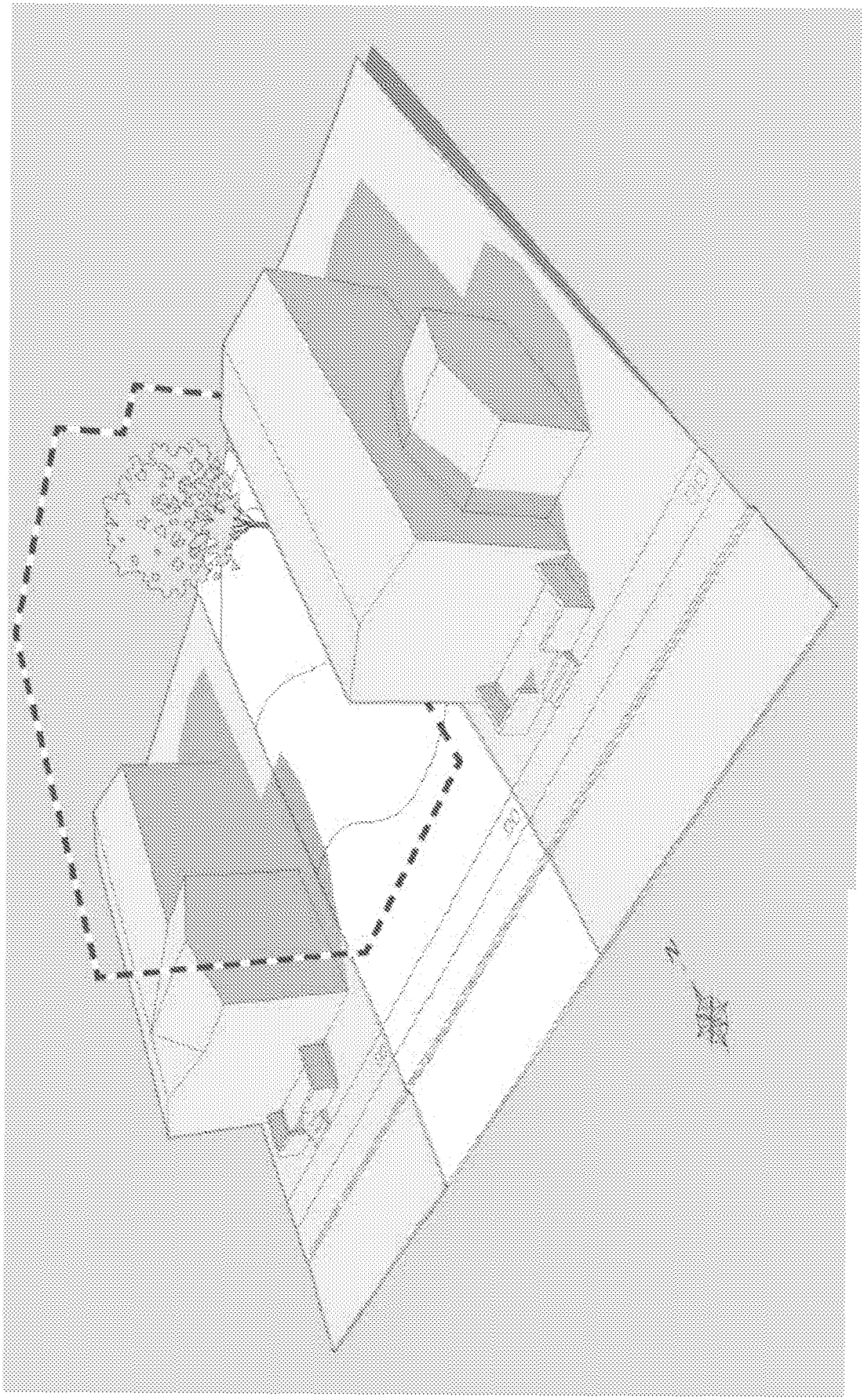

FIG. 5F

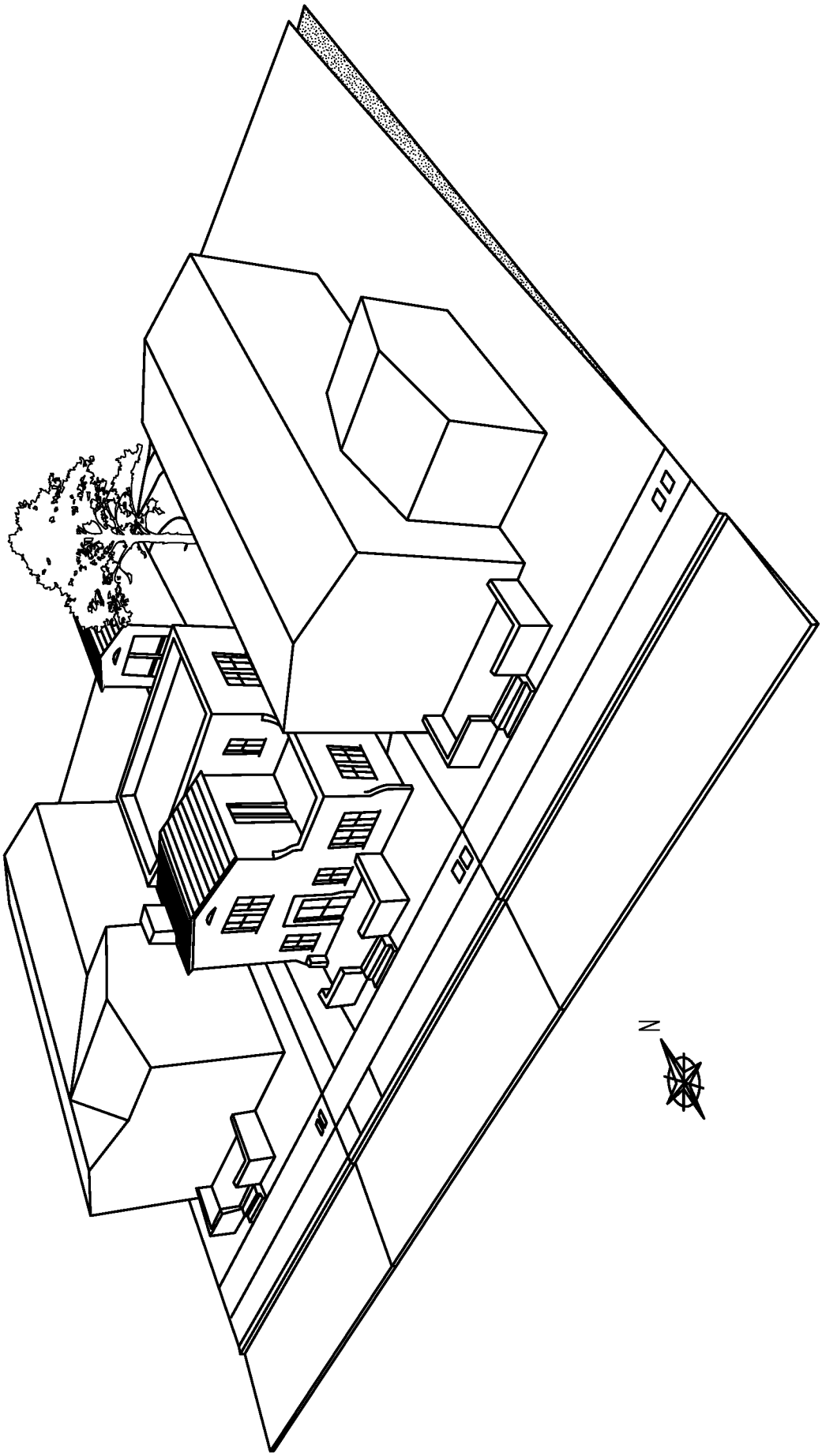

FIG. 5G

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/029262

A. CLASSIFICATION OF SUBJECT MATTER

G06F 17/50(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F 17/50; G06Q 10/06; G06Q 40/00; G06Q 50/08; G06Q 10/00; G06N 5/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: building design, collecting data, design candidate, approval, and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-0791475 B1 (EWHA UNIVERSITY-INDUSTRY COLLABORATION FOUNDATION et al.) 03 January 2008 See paragraphs [0017], [0027], and [0046]-[0047]; and figures 4a-4b.	1-20
Y	US 2010-0100405 A1 (LEPORE, GERARD et al.) 22 April 2010 See paragraphs [0022], [0027], [0075], and [0077]; claim 1; and figures 1b, 2, 3c, and 4b.	1-20
A	US 2005-0262462 A1 (JANAKIRAMAN, GOPALAKRISHNAN et al.) 24 November 2005 See paragraphs [0041]-[0043] and figures 1A-1B.	1-20
A	US 2011-0191069 A1 (MADSEN, TYGE et al.) 04 August 2011 See paragraphs [0085]-[0091] and figure 4.	1-20
A	US 8,290,801 B1 (ROACH, JR. WALTER et al.) 16 October 2012 See column 1, line 62 - column 2, line 55.	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 August 2014 (27.08.2014)	**27 August 2014 (27.08.2014)**

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/US2014/029262

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-0791475 B1	03/01/2008	None	
US 2010-0100405 A1	22/04/2010	None	
US 2005-0262462 A1	24/11/2005	US 2010-0115081 A1	06/05/2010
		US 7673027 B2	02/03/2010
		US 8145741 B2	27/03/2012
US 2011-0191069 A1	04/08/2011	AU 2009-266406 A1	07/01/2010
		CA 2729240 A1	07/01/2010
		CN 102165450 A	24/08/2011
		EP 2316084 A1	04/05/2011
		WO 2010-000017 A1	07/01/2010
US 8290801 B1	16/10/2012	None	