TABLE 2-6.A.1 – EARTHWORK & ENVIRONMENTAL PROJECT ELEMENTS



Category	ltem	L100	L200	L300	L350	L400
Earthwork	Existing Ground	Simplified as-built topographic surface is provided. Existing ground must meet surveying requirements. Refer to IDOT's Surveying Manual.	Actual surveyed and verified detailed surface modeled using Triangulation method. (3D)	Actual surveyed and verified detailed surface modeled using Triangulation method. Higher level of precision of the surveyed and verified surface elevations.	Areas where roadway and structural items are to be designed will contain geotechnical strata model within 30 feet of the influence area.	
	Grading (Final Surface)	General areas where existing elevations will be affected on the existing ground. Identify key elevation points of proposed work in coordination with applicable categories.	Key elevation points confirmed. Priority is on identifying vertical depths at the elevation points (i.e. high points and low points) and general slope directions. (3D)	Key elevation points and the vertical depths and slope directions confirmed and coordinated with drainage. Priority is on model surface precision.	Smoothing of model surface elements (i.e. ramp gores, bridge abutments, etc.)	Proposed grading for contractors to use for automated machine guidance.
	Grading (Construction Stages)	Proposed areas of each stage shown as a plane. Identify key elevation points of each stage in coordination with applicable categories.	Proposed areas and key elevation points of each stage confirmed. Priority is on identifying vertical depths at the elevation points (i.e. high points and low points) and general slope directions. (3D)	Key elevation points and the vertical depths and slope directions confirmed and coordinated with drainage. Priority is on model surface precision. Each stage shall be modeled separately.		Stockpile, mass hauls located and modeled. A-Forms (Tollway) & BDE-Forms (IDOT) tagged by Agency Representative Field Manager in issued model. Agency Representative Field Manager to identify destination of hauled off soils.
	Topsoil	General areas where existing elevations will be affected on the existing ground. Identify key elevation points of proposed work in coordination with applicable categories.	Key elevation points confirmed. Priority is on identifying vertical depths at the elevation points (i.e. high points and low points) and general slope directions. Earthwork quantities available. (3D)			Stockpile, mass hauls located and modeled. Proposed grading for contractors to use for automated machine guidance.
	Select Backfill	Proposed areas of select backfill shown as a plane.	Proposed areas confirmed. Priority is on approximate depth range of proposed select backfill. (3D)	Proposed areas and approximate depth range confirmed. Priority is on precision of select backfill volume.		
	Cut/Fill & Embankment *Tollway Specific requires Zone A & Zone B	Proposed Areas of cut/fill & embankment shown as a plane.	Proposed areas confirmed. Priority is on approximate depth range of cut/fill & embankment. (3D)	Depict zones of Embankment on the overall Earthwork model only if embankments of each side of the roadway/substructure require different embankment data. If embankment data on both sides are the same, Zone A and B depiction will not apply.		Stockpile, mass hauls located and modeled.
Environmental	Landscaping & Reforestation	2D layout of approximate locations of existing and proposed tree/shrubs.	2D layout of tree/shrub locations confirmed. Priority on general heights.	2D / 3D layout of tree/shrub locations. Tree type(s) identified. Priority on stem diameter and approximate canopy diameter.		
	Erosion Control (blankets, fiber rolls, rip- rap, buffer strips, silt fence, etc.)	Area/perimeter of erosional control identified on plan. <u>EC Blankets, Fiber Rolls, Buffer Strips</u> are sufficient for L100.	Silt Fence: generic model along perimeter of area of work. (3D) <u>Riprap:</u> Confirmed Location. Priority is on approximate depth range. (3D)	Riprap: Location and approximate depth range confirmed. Priority is on the precision of volume of riprap and rock size to be used. Show location of wetlands and prairie areas and related protection measures.		
	Environmental Soil Classification (disposal, reuse and construction worker precaution) *Tollway Specific	Identify areas of excavation on the plan. Identify initial boring locations within the excavation areas.	2D proposed plan of classifying non-special soil wastes to be hauled off and / or treated. Soil borings actually taken in field.	Actual surveyed and verified detailed surface modeled using Triangulation method. Higher level of precision of the surveyed and verified surface elevations. Extents of modeled depth based on soil boring logs.	Proposed grading; areas where proposed grading overlaps with existing or excavated areas. 3D modeled box of each type of terrain modeled with the associated combination of disposal (Hazardous Waste, Type 1, 2, 3, 4) and reuse (A, B, C) types and construction worker precaution areas.	A-Forms (A-51 & A-53) tagged by Agency Representative Field Manager in issued model. Agency Representative Field Manager to identify destination of hauled off soils.
	Environmental "Regulated" Soil Waste Classification *IDOT Specific	Identify areas of excavation on the plan. Identify initial boring locations within the excavation areas.	2D proposed plan of individual properties. Indicate those identified as Recognized Environmental Conditions (REC) sites. Indicate soil borings taken in the field.	Actual surveyed and verified detailed surface modeled using Triangulation method. Higher level of precision of the surveyed and verified surface elevations. Extents of modeled depth based on soil boring logs. Excavation length, width, and depth detailed for each property with ISGS site numbers.	Individual properties identified with ISGS site numbers and corresponding section of the specification or special provision that governs management of the soil due to regulated substances.	BDE Forms (BDE-2730 & BDE-2733) tagged by Agency Representative Field Manager in issued model. Agency Representative Field Manager to identify destination of hauled off soils.





	TABLE 2	2-6.A.2 – STORMWATER D	RAINAGE PROJECT ELEN	MENTS	Illinois Department of Transportation	11linois Tollway
Category	ltem	L100	L200	L300	L350	L400
	Drainage Structures (Manholes, catch basins, headwalls, junction chambers)	Priority is on the location of drainage structures.	Model of the drainage structure assembly as a generic element. Structure type, shape, orientation, dimensions, and wall thicknesses are modeled. Drainage Profile Alignments identified. (3D)	Modeled as specific structure. Bedding material and base course aggregate and thicknesses are identified. Openings for drains and other services modeled. Frames and grates modeled. Rim elevations and inverts are accurately located and modeled.	Reinforcements, safety grates, restrictor plates, energy dissipaters, check valves, etc. are identified and modeled.	Element modeling to include reinforcements, lifting loops, anchor bars, slots for grate, etc.
	Roadway Curb and Gutter (including concrete flumes)	Priority is on the location of the curb & gutters.	Model of the curb and gutter type being used. (3D)	Full extents of curb and gutters (bedding and base course aggregate materials and thicknesses) modeled. Distinguish between the elements.	Transitions between different type of curbs (regular to depressed curb transitions) modeled.	Reinforcements, pour stops, and expansion joints modeled.
	Culvert (between x>4' but 20'>x in width)		L	See culvert category for LOD requirements		
Stormwater Drainage	Storm Sewer (including trench drains, slotted drains, slope drains)	Priority is on the location of the storm sewer and associated pipelines and drains.	Model of the drainage structure assembly as a generic element. Pipe shape, vertical & horizontal alignment, dimensions, and wall thicknesses are modeled. Drainage Profile Alignments identified. (3D)	Modeled as specific structure. Bedding material and base course aggregate and thicknesses are identified. Pipe inverts are accurately located and modeled. Trench backfill modeled.		Reinforcements, pour stops, and expansion joints modeled.
	Pipe Underdrain	Priority is on the location of the pipe underdrain(s).	Model of the drainage structure assembly as a generic element. Pipe size and vertical & horizontal alignment are modeled. Drainage Profile Alignments identified. (3D)	Modeled as specific structure. Pipe underdrain headwalls to be modeled. Pipe underdrain inverts are accurately located and modeled.	Fabric lined trench identified and modeled.	
	Bathymetry (non- manmade bodies of water)	Priority is on the location and top-surface area of the bodies of water. Extents of depiction to be established.	Modeling of body of water grading. Drainage Profile Alignments and freeboard requirements identified. Stage volume relationship identified with the grading. (3D)	Proposed Surface: Complete and accurate surface definition based on defined fine grading, grade breaks, swales, surface shoreline materials, etc.		
	Detention Ponds	Priority is on the location and top-surface area of the detention pond(s).	Modeling of body of water grading. Drainage Profile Alignments and freeboard requirements identified. Stage volume relationship identified with the grading. (3D)	Proposed Surface: Complete and accurate surface definition based on defined fine grading, grade breaks, swales, surface shoreline materials, overflow weir, BMPs, etc.		
	Water Surface (bridges, culverts, curb and gutter, storm sewers, detention ponds, ditches)	Preliminary modeling of design WSE and HWL for bridges, culverts, and detention ponds.	Accurate modeling of design WSE and HWL for bridges, culverts, and detention ponds. (3D) Preliminary modeling of HGL for storm sewers and design WSE ditches. Preliminary modeling of spread. (3D)	Accurate modeling of HGL for storm sewers and design WSE for ditches. Accurate modeling of spread.		

TABLE 2-6.A.3 – UTILITIES, ITS, & ELECTRICAL PROJECT ELEMENTS



Category	ltem	L100	L200	L300	L350
Electrical	Underground Utilities (sanitary, water main, gas, fiber, electric)	Indication of approximate locations, lengths, and extents of the existing and proposed underground utilities. Existing utilities modeled as QL-C	Locations, lengths, and extents confirmed. Modeled elements to include: -approximate size, shape, and location of the pipes/conduits -approximate access/code clearance requirements modeled -Approximate elevations -Existing utilities modeled at QL-B -(3D)	Modeled elements to include: -Design-specified size of the pipes/conduits -Identification of pipe material -Schematic diagram showing the pipe network -Existing utilities modeled at QL-A	Element modeling to inclue -Pipe hanger and Clamp ar -Exact sloping of pipes -Pipe connection and bend -Expansion reducer and Co -Finishes i.e. painting, galve -Splash block
	Above Ground Utilities (water main, gas, fiber, electric, temporary lines)	Indication of approximate locations, lengths, and extents of the existing and proposed above ground utilities. Existing utilities modeled as QL-C	Locations, lengths, and extents confirmed. Modeled elements to include: -approximate size, shape, and location of the pipe/conduits -approximate access/code clearance requirements modeled -Approximate elevations -Existing utilities modeled at QL-B -(3D)	Element 3D modeling to include: -Design-specified size of the pipes/conduits -Identification of pipe material -Schematic diagram showing the pipe network -Existing utilities modeled at QL-A	Element modeling to inclue -Pipe hanger and Clamp ar -Exact sloping of pipes -Pipe connection and bend -Expansion reducer and Co -Finishes i.e. painting, galve -Splash block
	Distribution Systems and Above Ground Cabinetries (electrical services, cabinets for controlling ITS & Tolling Devices, IPDC Building)	Priority is on the location of the existing and proposed distribution systems and the above ground cabinetries.	Locations confirmed. Generic mass of each element to include information about depth, length and width. (3D)	Modeled elements to include: -length width and height of the elements -associated foundations	
ties/ITS/	Roadway Lighting	Priority is on the location of the existing and proposed roadway lighting.	Locations confirmed. Generic mass of each element to include information about width and height and associated foundation. (3D)	Modeled elements to include: -exact shape of the light poles -associated foundations -Anchor rods and bolts -Conduit	
Utiliti	Traffic Signals	Priority is on the location of existing and proposed traffic signals.	Locations of traffic signals and control cabinet confirmed. Generic mass of each element to include information about width and height and associated foundation. (3D)	Modeled elements to include: -exact shape of the signal supports -associated foundations, traffic signal control cabinet pad -Anchor rods and bolts -Conduit	
	Tolling Equipment & Devices (payment sensor loops, cameras, conduits that feed CAT-5 cables & devices) *Tollway Specific	Priority is on the location of the existing and proposed tolling equipment & associated devices. Included is also the length and extents of associated cables. Existing utilities modeled as QL-C	Locations confirmed. Generic mass of each element to include information about depth, length and width. Indicate approximate elevations of the associated cables. Existing utilities modeled at QL-B (3D)	Modeled elements to include: -length width and height and overall geometries of the tolling equipment and devices -Existing utilities modeled at QL-A	
	Intelligent Transportation Systems (ITS)	Indication of approximate locations, lengths, and extents of the existing and proposed ITS.	Locations, lengths, and extents confirmed. Modeled elements to include: -approximate size, shape, and location of the pipes/conduits -approximate access/code clearance requirements modeled -Approximate elevations -(3D)	Modeled elements to include: -Design-specified size of the pipes/conduits -Identification of pipe material and any foundation or concrete pads -Schematic diagram showing the pipe network -Anchor rods and bolts -Conduit	Element modeling to inclue -Pipe hanger and Clamp ar -Exact sloping of pipes -Pipe connection and bend -Expansion reducer and Co -Finishes i.e. painting, galve -Splash block

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TABLE 2-6.A.4 – SIGNAGE PROJECT ELEMENTS

Category	ltem	L100	L200	L300	L35
Signage	Signage (Overhead)	Priority is on the type of signs and horizontal location of the overhead signs. Existing with action to be taken and proposed signs identified.	The sign panel layout/legend format and size to be provided Identify if foundation is needed. If so, show depth/volume of foundation. Identify number of posts of the sign. Model of the sign support as a generic element: Model of the sign structure as a generic element: -Butterfly Type -Cantilever Type -Span Truss Type -Monotube Type -(3D)	Modeled as specific sign structure, length, substructure, bedding material and base course aggregate and thicknesses identified. -Actual elevations and location of member connections where applicable -Correct width, height and diameter of steel end supports. -Correct size of all truss members and chords. -Correct foundation type and size with grade beam and drilled shaft. -Signage materials identified.	Element modeling to inc -Welds -Coping of members -Cap plates -Washers, nuts, etc. -All assembly elements -Anchor bolts -Base plates -Main elements of typica applied if applicable -Any miscellaneous men size, shape, orientation,
	Signage (Roadside)	Priority is on the type of signs and horizontal location of the roadside signs. Existing with action to be taken and proposed signs identified.	The sign panel layout/legend format and size to be provided Identify if foundation is needed. If so, show depth/volume of foundation. Identify number of posts of the sign. Model of the sign support as a generic element: -Bridge Mounted -Barrier Assembly Mounted -Barrier Assembly Mounted -Breakaway Steel Mounted -Canopy Mounted -Canopy Mounted -Canopy Mounted -Light Pole Mounted -Noisewall Mounted -Structure Mounted -Truss column Mounted -Telescoping Steel Mounted -Wood Post Mounted -(3D)	 Full extent of sign support used. Support size, support height, foundations (for breakaway steel supports). Actual elevations of mounting support members. Main elements of mounting supports. Signage materials identified. 	Modeled element to incl -Mounting brackets -Anchor bolts -Base plates -Any miscellaneous men size, shape, orientation,

Illinois Department of Transportation	
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clude: al connections nbers with correct , and material.	Element modeling to include: -Joints
lude: nbers with correct , and material.	Element modeling to include: -Joints

TABLE 2-6.A.5 – ROADWAY PAVEMENT DESIGN & GEOMETRICS PROJECT ELEMENTS



Category	ltem	L100	L200	L300	L35
	Roadway Pavement (cross section templates - includes typical cross- sections, temporary pavement sections, and permanent pavement sections)	Indicate lengths, widths, and extents of the pavement. Identify existing and proposed right-of-way (ROW)	Horizontal dimensions confirmed. Model of the pavement type assembly as an element. Typical sections applied as cross- section templates in 3D model. (3D)	Modeled as specific layer of each pavement (i.e. thickness, bedding material and base course aggregate). All cross-slopes modeled.	
	Pavement Markings (includes temporary pavement markings and permanent pavement markings)	Identify existing pavement markings; proposed preliminary pavement markings indicated.	Finalized proposed pavement markings.	Overlay finalized pavement markings on 3D modeled pavement.	
trics	Geometrics	Existing horizontal alignment, proposed preliminary horizontal alignment project limits to be indicated; existing vertical alignment to be identified.	Proposed horizontal alignment(s) project extents confirmed; Preliminary proposed vertical alignment(s) to be indicated. (3D)	Finalized proposed horizontal, Finalized proposed vertical alignments.	
some	Superelevation	Existing superelevations identified; Preliminary superelevations and superelevation transitions to be indicated.	Proposed superelevations and superelevation transitions. (3D)	Finalized proposed superelevations and superelevation transitions.	
gn & Ge	Intersections & Driveways	Indicate lengths, widths, and extents of the intersections & driveways.	Horizontal dimensions confirmed. Generic of the pavement type thickness (3D)	Modeled as specific layer of each pavement (i.e. thickness, bedding material and base course aggregate). All cross-slopes modeled.	Modeled 3D connection elements and transition
nent Desi	Sidewalks	Indicate location, lengths, widths, and extents of the sidewalks.	Horizontal dimensions confirmed. Generic of the pavement type thickness. Identify locations of ADA ramps. (3D)	Modeled as specific layer of each pavement (i.e. thickness, bedding material and base course aggregate). ADA ramp and ramp transitions to be modeled. All cross-slopes modeled.	Modeled 3D connection elements and complex sidewalk and any existi features around it like s non-roadway pavement
Paver	Guardrail	2D general location of guardrail based on a Barrier Warrant Analysis. Proper location and orientation of obstacles and Area of Concerns shown. Anticipated type of barrier and terminals identified.	Foreslopes and backslopes based on 3D grading model used for guardrail analysis. Length of need for guardrail based on a Barrier Warrant Analysis confirmed. (3D) Lengths of and types of barriers correctly depicted with all connections, blockouts and general terminals located and identified. (3D)	Attenuators modeled. Grading in front of and behind terminals shown in 3D model.	
	Rigid (Concrete) Barriers	2D general location of barrier based on a Barrier Warrant Analysis. Proper location and orientation of obstacles and Area of Concerns shown. Anticipated type of barrier and terminals identified.	Coordination with structural elements. Final location of barrier(s) based on a Barrier Warrant Analysis confirmed. (3D) Lengths of and types of barriers correctly depicted with all connections and terminals located and identified. Transition(s) type identified. (3D)	Barrier elements properly located in 3D model and roadway templates. Full extents of traffic barrier material, footing, bedding material and base course aggregate and thicknesses identified and modeled based on coordination with structural design and the Barrier Warrant Analysis. When differentials on either side of barrier, identify and model applicable barrier type. Attenuators modeled.	Designed and finalized standard barriers only). the curb & gutter conne

(3D) = element's L200 requiring deliverables to be 3D modeled.

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0	L400
	Proposed pavement for contractors to use for automated machine guidance.
is to crossing s.	
s to crossing transitions (i.e. ng or proposed idecurbs or existing s)	
	Proprietary guardrail end-terminal systems modeled to use for Construction.
reinforcement (non- Add dowel bars at ction point.	

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TABLE 2-6.A.6 – ROADWAY MOT, SITEWORK & TOLLWAY PLAZA PLANS PROJECT ELEMENTS



Category	ltem	L100	L200	L300	L35
Maintenance of Traffic (MOT)	Temporary MOT Elements (Roadway Only)	Provide overall traffic flow patterns and number of lanes for each stage. Include: Lane widths and extents	Traffic patterns confirmed. Depict traffic control delineation devices (drums or barricades) and positive protection devices (TCB, impact attenuators, TMA's), lane tapers & shifts, positive protective elements, temporary median crossovers, ramp configurations (3D)		
	Temporary MOT Elements (Typical Sections)	Provide typical roadway cross section locations of each traffic stage. Include: Lane numbers & widths, identified work area, delineation devices, positive protective devices (TCB, guard rail), pavement markings, special conditions (such as rollovers or drop-offs). Depict conditions outside of travelled way (medians, slopes, structural elements, hazards, etc.). Provide sections at bridge structures, ramps and uniquely configured areas.	Typical cross-sections applied in cross- section templates and modeled as 3D elements. (3D)		
Site & Plaza Plans	Site work Plans (Oases, Maintenance Areas, parking areas, rest areas)	Identify existing site location(s); preliminary proposed layout depicting areas and horizontal extents.	Confirm horizontal extents. 3D generic model(s) of buildings with correct geometry where applicable. Refer to AIA LOD table for building details and associated property site. (3D)		
	Toll Plaza Plans and Details *Tollway Specific	Priority is on the horizontal location of the gantries.	Identify if foundation is needed. If so, show depth/volume of foundation. Model of the structure as a generic element. Loop locations to be indicated. (3D)	Modeled as specific structure, length, substructure, bedding material and base course aggregate and thicknesses identified. -Correct size of all truss members and chords. -Correct foundation type and size with grade beam and drilled shaft.	Element modeling to in -Actual elevations and lo connections where app -Correct width, height an end supports. -Main elements of typica applied if applicable -Any miscellaneous men size, shape, orientation

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clude: ocation of member icable Id diameter of steel I connections nbers with correct and material.	Element modeling to include: -Welds -Coping of members -Cap plates -Washers, nuts, etc. -All assembly elements -Anchor bolts -Base plates -Joints

TABLE 2-6.A.7 – BRIDGE DESIGN PROJECT ELEMENTS (DECK AND APPROACH SLABS)



Category	ltem	L100	L200	L300	L35
Bridge Design (Deck and Approach Slab)	Deck, Approach, Transition, and Sleeper Slabs	Priority is on the location, rough length and width, extents of each slab type.	Horizontals confirmed. Approximate slab thickness to be determined. (3D)	Element modeling to include: -Accurate size and shape of decks and parapets where applicable -Expansion joint with priority on location -Drip notch and corner chamfers -Exact sloping of concrete surfaces -Fillets over girders -Deck notches at abutments -Openings for Deck drainage -Reinforcement bars, Reinforcement bars (Epoxy coated)	Element modeling to inc -Pour joints -Expansion, construction construction joints -Bar splicers
	Parapets, Sidewalk and Median	Priority is on the location, rough length and width, extents of the parapets, sidewalk, and median.	Horizontal dimensions confirmed. Generic mass of members including information about depth, length, and width. (3D)	Element modeling to include: -Accurate size and shape of decks and parapets -Expansion joint with priority on location -Drip notch and corner chamfers -Exact sloping of concrete surfaces -Reinforcements bars and lap splices	Element modeling to inc -Expansion and construc -Cork Joint Filler, Polyure Aluminum sheet at joints
	Bridge Railing and Traffic Barrier	Basic mass w/o form or identification of material. Priority is on the horizontal extents of the railing and barriers.	Horizontal dimensions confirmed. Generic mass of members including information about depth, length, and width. (3D)	Element modeling to include: -Railing structural members -Base / Connection plate locations -Slotted holes in railing member elements	Element modeling to inc -Anchor bolts and studs -Locknuts and bolts. -Fabric reinforced elasto -Rail splice -Welds -Coping of members -Washers, nuts, etc.
	Light Pole Foundation and Parapet Conduit	Indication of approximate locations of Light Poles.	Locations confirmed. Generic mass of light pole base support including information about depth, length, and width. (3D)	Light pole foundation sized and formed to be constructed. Also included in model are: -Rebar -Conduit -Anchor rods and bolts	Element modeling to inc -Schematic of light pole t -Schematic of Vibration i -Junction box blockout(s -Washers, nuts, etc.
	Bridge Mounted Sign Support	Indication of approximate locations of these itemized elements.	Horizontal dimensions confirmed. Generic mass of members including information about depth, length, and width of the support structures. (3D)	Element modeling to include: -Steel structural members -Member connection locations	Element modeling to inc -Anchor bolts, Grout, Stif Connection plate/angle holes -PVC sleeve if applicable -Welds -Coping of members -Washers, nuts, etc.
	Expansion Joints	Indicate potential locations of expansion joints.	Horizontal dimensions confirmed. Generic mass of expansion joint including information about depth, length, and width. (3D)	Element modeling to include: -Locking edge rails with bends -Parapet / Sidewalk sliding plate -Neoprene glands	Element modeling to inc -Studs and embedment -Expansion anchors if ap -Welds, Joints and bends -Studs
	Deck Drains and Drainage Scuppers	Indication of approximate locations of the drains and scuppers.	Horizontal dimensions confirmed. Generic model of the drains and scuppers including information about depth, length, and width. (3D)	Element modeling to include: -Precise location and actual size of the drains/scupper -Scupper frames and downspouts -Finishes i.e. painting, galvanization etc.	Element modeling to inc -Bolts, Anchor rods, nuts -Modified reinforcement concrete deck -Welds, Joints and bends
	Drain Pipes and Support	Indication of approximate locations, lengths, and extents of the pipes.	Horizontal dimensions confirmed. Generic model of the pipe with approximate diameter and locations of supports (3D)	Element modeling to include: -Size of the pipes -Identification of pipe material -Finishes i.e. painting, galvanization etc. -Schematic diagram showing the pipe network -Exact sloping of pipes	Element modeling to inc -Pipe hanger and Clamp -Pipe connection and be -Expansion reducer and -Splash block -Welds, -Washers, nuts etc.

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TABLE 2-6.A.8 – BRIDGE DESIGN PROJECT ELEMENTS (SUPERSTRUCTURE)



Category	ltem	L100	L200	L300	L350	L400
Bridge Design (Superstructure)	Bridges Prestressed Concrete Beams	Basic mass w/o specific form or identification of material. Anticipated locations of girders and beams.	Element modeling to include: -Type of structural concrete system -Approximate geometry (e.g. depth) of structural elements -(3D)	Element modeling to include: -Specific sizes and locations of main concrete structural members modeled per defined structural grid with correct orientation -Concrete defined per spec (strength, etc.) -All sloping surfaces included in model element with exception of elements affected by manufacturer selection	Element modeling to include: -Strands profile and locations -Reinforcement and Lap splices -Welded Wire Reinforcement (WWR) -Fillets -Lifting devices -Embeds and anchor rods, plate assembly -Penetration for any utility item	Contractor to provide strand cutting sequence, concrete pour dates for each beam
	Bridge Girder Steel	Basic mass w/o specific form or identification of material. Anticipated locations of girders and beams.	Generic mass of Girder including information about Girder Depth, Web Plate Length and Flange Plate Width (3D)	Element modeling to include: -Thickness of Flange and Web plate -Finishes, i.e. painted, galvanized etc. -Framing section properties data integrated with framing model -Grade of Steel identified	Element modeling to include: -Stiffeners -Welds -Sloping of members, Camber, Flange Transitions -Diaphragm connection members -Field and shop splices -Shear studs -Penetration for any utility item -Top of beam elevations	Element modeling to include fabrication level information: -Welds -Coping of members -Washers, nuts, etc. -Field and shop splices
	Steel Diaphragms / Cross- frames	Basic mass w/o specific form or identification of material. Anticipated locations of diaphragms and other cross- frames.	Generic mass of members including information about depth, length and flange plate width (3D)	Element modeling to include: -Complete size of diaphragm steel members -Finishes, i.e. painted, galvanized etc <u>.</u> -Grade of steel identified	Element modeling to include: -Connection Plates, bolt holes -Welds -Sloping of members -Penetration for any utility item	Element modeling to include fabrication level information: -Welds -Coping of members -Washers, nuts, etc.
	Bearings	Approximate horizontal locations of the bearings.	Horizontal locations confirmed. Generic mass of the bearings including information about depth, length, and width. (3D)	Element modeling to include: -Bearing plates, elastomers, anchor bolts etc <u>.</u> -Finishes, i.e. painted, galvanized etc <u>.</u> -Grade of steel identified	Element modeling to include: -Bolts and anchor bolts -Sloping of members -Side Retainers -Elastomer reinforcement -Pintles -Neoprene pads -Shims	Element modeling to include fabrication level information: -Welds -Coping of members -Washers, nuts, etc.



TABLE 2-6.A.9 – BRIDGE DESIGN PROJECT ELEMENTS (SUBSTRUCTURE)



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	Category	ltem	L100	L200	L300	L35
Bridge Design (Substructure)	Concrete Pier and Crashwall	Priority is on the horizontal location of the concrete pier and crashwall.	Horizontal placements confirmed. Element modeling to include: -Approximate size and shape of pier elements e.g. Column, Cap, Crashwall etc. -(3D)	Element modeling to include: -Accurate size and geometry of the element -Sloping surfaces. -Reinforcements -Opening for utilities	Element modeling to inc -Lap splices, Hooks and spacers -PJF -Expansion / constructior	
	cture)	Concrete Abutment and Wingwall	Priority is on the horizontal location of the abutment and wingwall.	Horizontal placements confirmed. Element modeling to include: -Approximate size and shape of abutment and wingwall -(3D)	Element modeling to include: -Accurate size and geometry of the element -Sloping surfaces. -Reinforcements -Opening for utilities -Limits of structural excavation and Porous Granular backfill	Element modeling to inc -Reinforcements, Lap sp Bends -Bar splicer assembly -Water seal, PJF -Expansion / constructior
	MSE Abutment and Wingwall	Priority is on the horizontal location of the abutment and wingwall.	Horizontal placements confirmed. Element modeling to include: -Approximate size and shape of abutment, -MSE panels and wingwall -(3D)	Element modeling to include: -Accurate size and geometry of each element -Sloping surfaces. -Openings for utilities -Limit of estimated (0.7) reinforced soil mass/backfill	Specialty/customized ae panel face	
	Embankment and Slopewalls	Priority is on the location, length and width of he embankment and slopewalls.	Horizontal placements confirmed. Element modeling to include: -Approximate geometry of elements and locations -Identification of slopewall material -(3D)	Element modeling to include: -Actual cross-sectional size and area of the system -Embankment cones -Accurate sloping of the elements -Stone riprap and bedding if applicable -streambed (refer to bathymetry)	Element modeling to inc -Reinforcement details -PJF if applicable -Streambed -Filter fabric -Joint details	
	Waterways (refer to Bathymetry for water data)	Priority is on the locations of these itemized elements.	Horizontal placements confirmed. Element modeling to include: -Approximate coverage area of the waterways -(3D)	Element modeling to include: -Accurate coverage area of the waterways -Vertical clearance information	Element modeling to inc -EWSE -Streambed elevation -Depth to bearing stratun -Penetration into bearing -Locations of lap splices -Rebar including hooks a	



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esthetic design of	Element Modeling to include: -MSE wall Soil Reinforcement -Abutment Soil Reinforcement -Reinforcements and Lap splices -PJF -Openings for utilities -Limits of reinforce soil mass and select backfill
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TABLE 2-6.A.10 – BRIDGE DESIGN PROJECT ELEMENTS (FOUNDATIONS)



Category	ltem	L100	L200	L300	L350
	Bridge Substructure Foundation (Shallow foundation)	Priority is on the location and horizontal extents of the foundation.	Horizontal placements confirmed. Element modeling to include: -Approximate size and shape of foundation element -(3D)	Element modeling to include: -Overall size and geometry of the foundation element -Sloping surfaces. -External dimensions of the members -Geotechnical bearing strata elevation is modeled from geotechnical report. -Reinforcements -Limits of structural excavation and Porous Granular backfill	Element modeling to inc -Lap splices, Hooks and -Construction joints
Foundations	Bridge Substructure Foundation (Drilled Shaft)	Priority is on the location and horizontal extents of the drilled shafts.	Horizontal placements confirmed. Element modeling to include: -Approximate geometry (e.g. depth) of the drilled shafts -(3D)	Element modeling to include: -Assumed bearing depth per geotechnical report -Top and Bottom of shaft -Actual top of shaft, expected bottom of shaft and estimated top of rock -Size of shaft -Permanent casing, when required -Reinforcements	Element modeling to inc -Lap splices including bu -Pipes for crosshole Soni -Depth to bearing stratun -Penetration into bearing -Locations of lap splices -Rebar including hooks a
	Bridge Substructure Foundation (Pile Foundation)	Priority is on the location and horizontal extents of the piles.	Horizontal placements confirmed. Element modeling to include: -Approximate geometry (e.g. depth) of the piles -(3D)	Element modeling to include: -Accurate Size and geometry of pile cap -Assumed bearing depth per geotechnical report -Top of Pile, Top of Pile Cap, Pile Cap Size, Expected bottom of pile -Pile size and cross-sectional geometry -Pile shoes, when required -Pre-coring requirements -Backfilling of pre-cored holes requirements -Reinforcements	Element modeling to inc -Lap splices in pilecap -Concrete encasement -Pile casing if applicable -Depth to bearing stratun -Penetration into bearing -Pile splices -Rebar including hooks a

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m g stratum	
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TABLE 2-6.A.11 – RETAINING WALL PROJECT ELEMENTS



Category	ltem	L100	L200	L300	L350	L400
Retaining Wall	Cast-In-Place T-Type	Priority is on the location and horizontal extents of the CIP concrete T-type wall.	Element modeling to include: -Approximate limits of concrete walls indicating earth retention and approximate grade on each side -(3D)	Element modeling to include: -Accurate size and geometry of the element -Earthwork surfaces for wall -Limits of structural excavation and Porous Granular backfill -Reinforcements -Openings for utilities	Element modeling to include: -Lap splices, Hooks and Bends -Water seal, PJF -Expansion / construction joints -Weep holes if applicable	
	MSE Wall	Priority is on the location and horizontal extents of the wall.	Element modeling to include: -Approximate limits of MSE walls indicating earth retention and approximate grade on each side -(3D)	Element modeling to include: -Accurate size and geometry of each element -Earthwork surfaces for wall -Openings for utilities -Limit of estimated (0.7) reinforced soil mass/backfill	Specialty/customized aesthetic design of panel face	Element Modeling to include: -MSE wall Soil Reinforcement -Reinforcements and Lap splices -PJF -Openings for utilities -Limits of reinforce soil mass and select backfill
	Moment Slab on Retaining Wall	Priority is on the location and horizontal extents of the wall.	Element modeling to include: -Approximate size and shape of elements -(3D)	Element modeling to include: -Accurate size and geometry of the element -Earthwork surfaces for wall -Opening for utilities -Reinforcement	Element modeling to include: -Lap splices, Hooks and Bends -PJF -Expansion / construction joints	
	Pipe Railing	Basic mass w/o form or identification of material. Horizontal extents to be determined.	Horizontal location confirmed. Element modeling to include: -Approximate size and shape of elements -(3D)	Element modeling to include: -Railing structural members -Base / Connection plates -Slotted holes in railing member elements	Element modeling to include: -Anchor bolts and studs -Locknuts and bolts. -Fabric reinforced elastomeric pad -Rail splice	Element modeling to include fabrication level information: -Welds -Coping of members -Washers, nuts, etc.
	Light Pole Mounting	Indication of approximate locations of Light Poles.	Generic mass of light pole base support including information about Depth, Length and Width (3D)	Light pole foundation sized and formed to be constructed. Also included are: -Anchor rods and bolts -Conduit, Pole Foundations -Rebars	Element modeling to include: -Schematic of light pole base plate -Schematic of Vibration isolation pad -Washers, nuts, etc.	
	Soldier Pile Wall	Priority is on the location and horizontal extents of the wall.	Element modeling to include: -Approximate limits of walls indicating earth retention and approximate grade on each side -Identification of type of wall e.g. Drilled or Driven soldier pile wall -(3D)	Element modeling to include: -Accurate size and geometry of each element -Wall facing and type of facing e.g. CIP vs Precast -Earthwork surfaces for wall -Accurate geometry of the soldier pile with encasement if applicable -Estimated embedment of soldier pile from Geotechnical report	Element Modeling to include: -Reinforcements and Lap splices -Shear studs -CLSM -Schematic of Timber Lagging -Openings for utilities -Gutter at top of wall -Indication of existing ground surface -Limits of soil removal	Element modeling to include fabrication level information: -Accurate geometry of Timber lagging
	Permanent Sheet Pile Wall	Priority is on the location and horizontal extents of the wall.	Element modeling to include: -Approximate limits of walls indicating earth retention and approximate grade on each side -(3D)	Element modeling to include: -Accurate size and geometry of each element -CIP facing or CIP cap if applicable -Estimated embedment of sheet pile from Geotechnical report	Element Modeling to include: -Reinforcements and Lap splices -Shear studs if applicable -Openings for utilities -Indication of existing ground surface -Limits of soil removal	Element modeling to include fabrication level information: -Accurate size of the sheet piles and splices
	Soil Nail Wall	Priority is on the location and horizontal extents of the wall.	Element modeling to include: -Approximate limits of walls indicating earth retention and approximate grade on each side -(3D)	Element modeling to include: -Accurate size and geometry of each element -Drainage system behind the wall -Temporary and Permanent facing material	Element Modeling to include: -Reinforcements and Lap splices -Openings for utilities -Bearing plate, studs, and washers -Indication of existing ground surface -Grout	Element modeling to include fabrication level information: -Accurate size and spacing of soil nails



TABLE 2-6.A.12 – NOISE ABATEMENT WALL PROJECT ELEMENTS



Category	ltem	L100	L200	L300	L35
Noise Abatement Wall	Precast Concrete Panel	Priority is on the location and horizontal extents of the panels.	Horizontal placements confirmed. Element modeling to include: -Approximate limits of concrete walls indicating earth retention and approximate grade on each side -(3D)	Element modeling to include: -Accurate size and geometry of the element -Sloping surfaces. -Openings for utilities	Specialty/customized ae panel face
	Steel Posts and Supports	Basic mass w/o form or identification of material. Priority is on length and extents.	Length and extents confirmed. Generic mass of members including information about Depth, Length and Flange Plate Width (3D)	Element modeling to include: -Complete size of steel members. -Finishes, i.e. painted, galvanized etc. -Grade of Steel to be used	
	Ground Mounted NAW Foundation (Drilled Shaft)	Priority is on the location and horizontal extents of the drilled shafts.	Horizontal placements confirmed. Element modeling to include: -Approximate geometry (e.g. depth) of structural elements -(3D)	Element modeling to include: -Accurate size and geometry of the element -Sloping surfaces.	

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	TABLE 2-	6.A.13 – TEMPORARY STF	EMENTS	Illinois Department of Transportation	Illinois Tollway	
Category	ltem	L100	L200	L300	L350	L400
ructures	Temporary Soil Retention System	Priority is on the location and extents of the soil retention system.	Location and extents confirmed. Element modeling to include: -Approximate geometry of elements and locations -Identification of type of system (e.g. Temporary Sheet Piling, Temporary Soil Retention System or Braced Excavation) based on the recommendation in the Geotechnical report -(3D)	Element modeling to include: -Accurate geometry and locations of the elements -Geotechnical bearing strata elevation from geotechnical report.	Element modeling to include: -Sheetings, wales, deadman, piles or any other potential retention system components.	Element modeling to include: -Complete geometry of elements with precise locations
Temporary St	Temporary Geotextile Walls and Temporary MSE Systems	Priority is on the location and extents of the geotextile walls and temporary MSE Systems.	Element modeling to include: -Approximate geometry of elements and locations -Identification of type of system (e.g. Temporary Geotextile Walls, Temporary MSE Systems) based on the recommendation in the Geotechnical report -(3D)	Element modeling to include: -Accurate geometry and locations of the elements -Geotechnical bearing strata elevation from geotechnical report.		For Temporary MSE Systems: the geometry of each of the panels, reinforcement lengths, locations, and materials, any additional mesh or fabric to be used, bedding requirements, and select fill requirements
	Cofferdams and Seal Coats	Priority is on the location and extents of the cofferdams and seal coats.	Element modeling to include: -Approximate geometry of elements and locations -(3D)	Element modeling to include: -Accurate geometry and locations of the elements -Geotechnical bearing strata elevation from geotechnical report.	Element modeling to include: -EWSE -Streambed elevation -Estimated bottom of sheeting -Estimated bottom of seal coat	Element modeling to include: -Complete geometry of elements with precise locations

TABLE 2-6.A.14 – CULVERTS PROJECT ELEMENTS

Category	ltem	L100	L200	L300	L350
Culverts	Cast-in-Place Culvert	Priority is on the location and horizontal extents of the culvert and cast-in-place wingwalls (if applicable).	Location confirmed. Element modeling to include: -Approximate size and number of barrels of culvert. -Approximate limits of wingwalls indicating earth retention and approximate grade on each side. -Drainage Profile Alignments identified. -(3D)	Element modeling to include: -Overall size and geometry of the culvert barrels and cast-in-place wingwalls (if applicable) -Accurate size and geometry of culvert and cast-in-place wingwalls. -Weep holes and drains accurately represented. -Strength of concrete material identified -Reinforcement -Limits of structure excavation and porous granular backfill	Element modeling to inc -Lap splices, Hooks and I -Construction joints -Chamfers and drip notch
	Precast Concrete Culvert	Priority is on the location, rough length, width, and height of barrels.	Location confirmed. Element modeling to include: -Approximate size and number of barrels of precast concrete culvert panels. -Size and type of end section (cast-in-place or precast) -Drainage Profile Alignments identified. -(3D)	Element modeling to include: -Accurate size and geometry of the culvert barrels. -Accurate size of end sections.(cast-in-place or precast) -Weep holes and drains accurately represented. -Strength of concrete material identified -Reinforcements -Limits of structure excavation and porous granular backfill	Element modeling to inc -Lap splices in cast-in-pla
	Permanent Sheet Pile Wingwall	Priority is on the location and horizontal extents of the wingwall.	Element modeling to include: -Approximate limits of wingwalls indicating earth retention and approximate grade on each side -(3D)	Element modeling to include: -Accurate size and geometry of each element -CIP or steel cap if applicable. -Estimated embedment of sheet pile from Geotechnical report. -Grade of steel identified -Reinforcement	Element modeling to inc -Lap splices -Shear studs if applicable -Indication of existing gro -Limits of soil removal
	Soldier Pile Wingwall	Priority is on the location and horizontal extents of the wingwall.	Element modeling to include: -Approximate limits of wingwalls indicating earth retention and approximate grade on each side. -Identification of type of wall e.g. drilled or driven soldier pile wall. -(3D)	Element modeling to include: -Accurate size and geometry of each element. -Wall facing and type of facing. -Exact sloping surfaces. -Accurate geometry of the soldier pile with encasement, if applicable. -Estimated embedment of soldier pile from Geotechnical Report. -Grade of steel pile/concrete strength/minimum timber lagging strength identified -Reinforcement	Element modeling to inc -Lap splices -Shear studs -CLSM -Schematic of timber lago -Indication of existing gro -Limits of soil removal.

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include: n-place components.	Element modeling to include: -fabrication level information. -welded wire fabric layout
include: able. ground surface I	Element modeling to include fabrication level information: -Accurate size of the sheet piles and splices
include: lagging ground surface. l.	Element modeling to include fabrication level information: -Accurate geometry of timber lagging.