



Plan Content and Design Guidance

Oldham County Engineer

Purpose: This guidance was developed by the Oldham County Engineering Department to assist owners, land developers, and design engineers in submitting construction plans that are complete and in compliance with accepted engineering design principles and standards required by Oldham County ordinances or other legislative/regulatory agencies. This guidance is not a comprehensive list of plan content or design principles and will not guarantee plan approval when used. It represents the minimum level of plan content and design principles requested by the Oldham County Engineering Department and should be used by owners, land developers, and design engineers in locating and applying accepted and/or recommended engineering design principles and regulatory standards to design and plan submissions. It is the sole responsibility of owners, land developers, and design engineers to ensure that construction plans comply with all laws, codes, ordinances, regulations, and accepted engineering design principles.

- Ref:**
- a) Control of Construction Site Runoff of Pollutants and Sediment to the Streams and Waterways of Oldham County, Ordinance 05-830-326
 - b) Control of Post-Construction Stormwater, Pollutants, and Sediment to the Streams and Waterways of Oldham County, Ordinance No. 16-830-348
 - c) Detection and Elimination of Illicit Discharges To the Streams and Waterways of Oldham County, Ordinance No. 04-830-217
 - d) Best Management Practices (BMP) Manual for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites, (Current Version)
 - e) Oldham County Subdivision Regulations
 - f) Oldham County Comprehensive Zoning Ordinance
 - g) TR-55, Urban Hydrology for Small Watersheds, USDA, NRCS
 - h) Metropolitan Sewer District (MSD) Design Manual (Current Version)
 - i) Kentucky Transportation Cabinet Drainage Guidance Manual
 - j) FHWA Urban Drainage Design Manual, HEC-22
 - k) A Policy on Geometric Design of Highways and Street, AASHTO, (Current Edition)
 - l) Guidelines for Geometric Design of Very Low-Volume Local Roads, AASHTO (Current Edition)

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***Note:** Oldham County Fiscal Court (OCFC) has yet to develop its own standards for engineering design and construction. As such, the Oldham County Engineer may accept, on a case-by-case basis, engineering design and construction standards adopted by other legislative/regulatory agencies. An example of an engineering design and construction standard that may be considered acceptable is the Metropolitan Sewer District (MSD) Design Manual, promulgated in 2009. Some of the acceptable design standards are referenced in this guidance and are denoted with a “*” following the standard.



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GENERAL PLAN CONTENT GUIDANCE

(The below content shall be included on all sheets/drawings)

| | |
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| | Title Block has been provided. |
| | <p>Title Block includes the following information:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Project Title has been provided. (Ref f – Div 390-020) <input type="checkbox"/> Sheet Title has been provided. <input type="checkbox"/> Sheet Number has been provided. <input type="checkbox"/> Address of Property has been provided. (Ref f – Div 390-020) <input type="checkbox"/> Owner Name, Address, and Telephone Number have been provided. (Ref f – Div 390-020) <input type="checkbox"/> Developer Name, Address, and Telephone Number have been provided. <input type="checkbox"/> Professional Engineer Stamp, Signature, and Date have been provided. (Ref f – Div 390-020) <input type="checkbox"/> Professional Engineering Company Name, Address, and Telephone Number have been provided. <input type="checkbox"/> Plan Date has been provided. (Ref f – Div 390-020) <input type="checkbox"/> Revision Block with Revision Information (if any) has been provided. |
| | North Arrow has been provided. (Ref f – Div 390-020) |
| | Scale has been provided. |
| | Match Lines (Where Applicable) have been provided. |
| | Notes have been provided. |
| | <p>Legend: (Where Applicable)</p> <ul style="list-style-type: none"> <input type="checkbox"/> All symbols used on the individual sheet have been annotated in the legend. <input type="checkbox"/> All abbreviations used on the individual sheet have been annotated in the legend. |



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| COVER SHEET GUIDANCE | |
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| | Location Map with North Arrow has been provided. (Ref a – Section 10, Ref f – Div 390-020) |
| | Legal Description (i.e., Lot Number, Tract, Plat ID) has been provided. (Ref f – Div 390-020) |
| | Index of Sheets has been provided. |
| | Land Zoning Information has been provided. (Ref a – Section 10, Ref f – Div 390-020) |
| | Utility Contacts and Notes have been provided. |
| | Benchmark Data and Datum have been provided. (Ref a – Section 10) |
| | Total Project Acreage has been provided. (Ref a – Section 10) |
| | Land-Disturbance Acreage has been provided. (Ref a – Section 10) |
| | Right-of-Way Acreage has been provided. |
| | Impervious Acreage has been provided. (Ref f – Div 390-020) |
| | “Open Space” Acreage has been provided. (Ref e – Section 5.12) |
| | Number of Lots within Subdivision has been provided. |
| | Listing of all Waivers and Variances approved by Oldham County. |
| | <p>Listing of applicable permits including, but not limited to, the following has been provided:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Oldham County Permit: <ul style="list-style-type: none"> <input type="checkbox"/> Stormwater Quality Management and Erosion Control Permit. <input type="checkbox"/> Oldham County Flood Plain Permit. <input type="checkbox"/> KY Department of Water Permits: (KRS 151.320) <ul style="list-style-type: none"> <input type="checkbox"/> KPDES Construction General Permit (KYR10). <input type="checkbox"/> KPDES Individual Permit. <input type="checkbox"/> Water Quality Certification (Section 401) Permit. <input type="checkbox"/> Flood Plain Construction Permit. <input type="checkbox"/> Stream Construction Permit. <input type="checkbox"/> Army Corps of Engineers Permit (Section 404): <ul style="list-style-type: none"> <input type="checkbox"/> Nationwide Permit (NWP). <input type="checkbox"/> Individual Permit. |
| | <p>Note: All required permits issued by entities other than the Oldham County Engineer (i.e., US Army Corps of Engineers, Kentucky Division of Water, etc.) should be provided to the Oldham County Engineering Office for final plan approval (KRS 151.320)</p> |



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| SITE (LAYOUT) PLAN GUIDANCE | |
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| | Land Zoning Boundaries have been included and labeled. (If Applicable) (Ref f – Div 390-020) |
| | Property Boundary Limits (Including Bearings and Distances) have been included and labeled. (Ref f – Div 390-020, Ref d – Section 3.5) |
| | Lot Layout (i.e., Number, Boundary, Acreage, Bearings and Dimensions, etc.) has been included and labeled. (Ref e – Section 5.7, Ref d – Section 3.5) |
| | Adjacent Property Owners have been included and labeled. (Ref f – Div 390-020) |
| | Wetland Information (Or a statement that none are present on the site) has been provided. |
| | Rivers, Streams, etc. (Ref f – Div 390-020): <ul style="list-style-type: none"> <input type="checkbox"/> Waters have been included and labeled as Perennial, Intermittent, and/or Ephemeral. <input type="checkbox"/> Classification of river, stream, etc. (if any) (i.e., high quality water, exceptional water, etc.). <input type="checkbox"/> Or a statement has been provided that no rivers, streams, etc. are present on the site. |
| | Karst Features: (Ref d – Section 3.5) <ul style="list-style-type: none"> <input type="checkbox"/> Features have been included and labeled as caves, sink holes, etc. <input type="checkbox"/> Or a statement has been provided that no karst features are present. |
| | Flood Plain Boundaries: (Ref f – Div 390-020) <ul style="list-style-type: none"> <input type="checkbox"/> Flood Plain Information (FEMA Panel #, Effective Date) has been provided. <input type="checkbox"/> Boundaries have been included and labeled. <input type="checkbox"/> No land disturbance or structures have been placed in flood plain without required permits. <input type="checkbox"/> Or a statement has been provided that the flood plain is not present on the site. |
| | Tree Canopy has been included and labeled. (Ref f – Div 390-020) |
| | Borings and Soundings have been included and labeled. |
| | Street Names have been included and labeled. (Ref e – Section 5.10) |
| | Centerline Stationing has been included and labeled. |
| | Existing Contours have been included and labeled. (Ref f – Div 390-020) |
| | Building Line Setback has been included and labeled. (Ref e – Section 5.7, Ref f – Div 390-020) |
| | Existing / Proposed Buildings and Structures have been included and labeled. (Ref f – Div 390-020) |
| | Existing / Proposed Impervious Areas have been included and labeled (Ref d – Section 3.5). |
| | Existing / Proposed Utilities have been included and labeled. (Ref f – Div 390-020) |
| | Existing / Proposed Stormwater Drainage Facilities / Piping have been included and labeled. |
| | Existing / Proposed Easements: (Ref f – Div 390-020) <ul style="list-style-type: none"> <input type="checkbox"/> All public utilities (sanitary, storm, etc.) have been located in an easement or public right-of-way. <input type="checkbox"/> Easement widths and type have been included and labeled. <input type="checkbox"/> For residential subdivisions, easements have been provided for all public stormwater structures and piping. <input type="checkbox"/> For commercial or industrial properties, stormwater detention or retention features have been located in an easement. <input type="checkbox"/> Stormwater easement widths have been based on pipe diameter. (Ref h – Section 7.4*) |
| | Existing / Proposed Rights-of-Way and Access Easements have been included and labeled. |
| | Right-of-Way Widths have been included and labeled. (Ref e – Section 6.3, Section 7.1) |
| | Street Requirements: (Ref e – Section 5.3, Ref f – Div 390-020, Ref k, Ref l) |



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| | <ul style="list-style-type: none"> <input type="checkbox"/> Street classification has been provided for all streets. <input type="checkbox"/> Intersection standards have been addressed (Angle, Curb Radii, Spacing, Sight Triangle, etc.). <input type="checkbox"/> Street requirements have been included (Alignment, Elevation, Turning Lanes, etc.). |
| | <p>Road requirements (Streets, Cul-De-Sacs, intersections, etc.): (Ref f – Div 390-020, Ref k, Ref l)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pavement Width has been addressed. (Ref e – Section 7.1) <input type="checkbox"/> Length has been addressed. (Ref e – Section 5.3) <input type="checkbox"/> Intersection Curb Radii have been addressed. (Ref e – Section 5.3) <input type="checkbox"/> Cul De Sac Length has been addressed. (Ref e – Section 5.3) <input type="checkbox"/> Cul De Sac Radii have been addressed. (Ref e – Section 7.1) <input type="checkbox"/> Shoulder Width has been addressed. (Ref e – Section 7.1) <input type="checkbox"/> Street/Road/Cul-de-sac Bulb Grades have been addressed. (Ref e – Section 7.1) |
| | Horizontal Curve Information has been provided for each horizontal curve. |
| | <p>Sidewalk requirements: (Ref e - Section 5.5, Section 6.3, Ref f – Div 390-020)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Location, Width, Offset from back of curb have been addressed. <input type="checkbox"/> Cross Slope has been addressed. <input type="checkbox"/> ADA standards have been addressed. |
| | Curb and Gutter requirements have been addressed. (Ref e – Section 6.3, Section 7.1) |
| | <p>Existing / Proposed Retaining Walls:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Retaining walls have not been constructed within utility and drainage easements. <input type="checkbox"/> Retaining wall foundation has been defined. <input type="checkbox"/> Top and bottom elevations have been indicated. <input type="checkbox"/> Retaining wall design has been included in plan set (or will be included with building permit application). |



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| GRADING PLAN GUIDANCE | |
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| | Grading Limits: <ul style="list-style-type: none"> <input type="checkbox"/> Limits of Disturbance has been included and labeled. <input type="checkbox"/> Tree Protection Area/Fencing has been included and labeled. |
| | Protection / Buffer Areas for waters have been provided based on the following: <ul style="list-style-type: none"> <input type="checkbox"/> A 25-foot buffer zone for waters classified as High Quality Waters or Impaired Waters. <input type="checkbox"/> A 50-foot buffer zone for waters classified as Coldwater Aquatic Habitat Outstanding State Resource Water, Outstanding National Resource Water, Exceptional Water, or listed as an Impaired Water for which an approved TMDL has not been developed. |
| | Existing / Proposed Contours: (Ref f – Div 390-020) <ul style="list-style-type: none"> <input type="checkbox"/> Appropriate contour intervals have been used. <input type="checkbox"/> Contours are shown for the entire drainage area. <input type="checkbox"/> Different line weights have been used for existing and proposed contours. |
| | Off-site Grading: <ul style="list-style-type: none"> <input type="checkbox"/> The property owner and/or developer are responsible for coordinating and obtaining proper approval for grading and/or construction on areas outside the project’s property limits. |
| | Lot-to-Lot Drainage: <ul style="list-style-type: none"> <input type="checkbox"/> No Lot-to-Lot drainage has been included for residential developments. <input type="checkbox"/> If lot-to-lot drainage is being implemented, justification has been provided. |
| | Drainage has been indicated by the following: (Ref d – Section 3.5) <ul style="list-style-type: none"> <input type="checkbox"/> Flow arrows <input type="checkbox"/> High points. <input type="checkbox"/> Sags. |



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| | Tree Canopy has been included and labeled. |
| | Clearing Limits: (Ref a – Section 10) <ul style="list-style-type: none"> <input type="checkbox"/> Limits of Disturbance has been included and labeled. <input type="checkbox"/> Tree Protection Area/Fencing has been included and labeled. |
| | Slopes greater than 25% (4:1) have been labeled. |
| | Standard Notes for Erosion Prevention and Sediment Control have been annotated on the plan (Ref d – Section 3.6). Typical notes are provided below: <ul style="list-style-type: none"> <input type="checkbox"/> The SWPPP must be developed and implemented before any land-disturbing activities. Sediment controls such as rock site exit pads, traps, and silt fences must be installed before land clearing, excavation, or placement of fill material. <input type="checkbox"/> Detention basins, if used, must be constructed first and must perform as sediment basins until the contributing drainage area is seeded and stabilized. Outlets must be modified, if necessary, to maximize detention and sediment removal during construction. <input type="checkbox"/> Soil stockpiles must be located away from streams, ponds, swales and catch basins. Stockpiles must be seeded, mulched, and adequately contained through the use of silt fence. <input type="checkbox"/> Minimize the tracking of mud, soil, and rock from construction areas onto roadways. Mud, soil, and rock tracked onto the roadway must be removed daily. <input type="checkbox"/> All stream crossings must use properly designed low-water crossing structures authorized under a USACE Clean Water Act section 404 permit. <input type="checkbox"/> All bare soil areas not subject to active clearing, excavation, grading, or fill activities must be stabilized with temporary or permanent seeding or mulching within 14 days. <input type="checkbox"/> All areas within 25 to 50 ft. of streams, rivers, lakes, wetlands, and sinkholes must be flagged as off-limits to vehicles, equipment, and soil disturbance activities. |
| | Standard Oldham County EPSC Notes have been included. (Ref d - 3.6) <ul style="list-style-type: none"> <input type="checkbox"/> A Qualified Professional shall be used to conduct all permittee-conducted erosion prevention and sediment control (EPSC) inspections. <input type="checkbox"/> Permittee-Conducted Inspections shall be conducted every seven calendar (7) days and within 24 hours of a 0.5 inch of rain. <input type="checkbox"/> All Permittee-conducted inspections shall be documented on the form provided by the Oldham County Engineer’s Office. <input type="checkbox"/> All inspection documentation shall be readily available to the Oldham County Engineering Office on-site, at all times. <input type="checkbox"/> The Stormwater Quality Management and Erosion Control Permit holder is responsible for having a concrete washout area provided in a suitable location with appropriate signage. This concrete washout shall be maintained until the “Stormwater Quality Management and Erosion Control” Permit is terminated, in writing, by the Oldham County Engineer. Once terminated, the concrete washout may be removed. |
| | Construction Phasing / Sequencing (Ref d – 4.3) including, but not limited to, the following: <ul style="list-style-type: none"> <input type="checkbox"/> Conduct a pre-construction meeting with the Oldham County Site Inspector. <input type="checkbox"/> Install Stabilized Construction Entrance(s) (SCE). |



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| | <ul style="list-style-type: none"> <input type="checkbox"/> Install perimeter controls (Clearing, grubbing, and grading is permitted only for the installation of perimeter controls. No mass clearing, grubbing, or grading is permitted as part of this phase). <input type="checkbox"/> Contact Oldham County Site Inspector to conduct perimeter control inspection (Ref a – Section 8). <input type="checkbox"/> Construct and stabilize the sediment basin and/or sediment traps (if applicable). (Clearing, grubbing, and grading is permitted only for the installation and stabilization of the basin or trap. No mass clearing, grubbing, or grading is permitted as part of this phase). <input type="checkbox"/> Conduct site clearing, grubbing, and grading. <input type="checkbox"/> Installation and maintenance of EPSC measures for each phase of construction. (Ref a – Section 10) <input type="checkbox"/> Temporary / Permanent stabilization plans and sequencing. (Ref a – Section 10) |
| | Drainage Control Points have been included and labeled. (i.e., Outfalls, etc.). (Ref a – Section 10, Ref d – Section 3.5) |
| | Perimeter Controls have been included and labeled (i.e., Silt Fencing, Inlet/Outlet Protection, etc.). (Ref a – Section 10) |
| | <p>Location, dimensions, details, specifications, and construction details for all temporary and permanent stormwater quality measures including, but not limited to, the below have been included and labeled. (Ref a – Section 10, Ref d – Section 3.5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Construction Entrances for Ingress / Egress Locations. (Ref d - 4.3.2) <input type="checkbox"/> Staging and Stockpiling Areas. (Ref d – 4.3.4) <input type="checkbox"/> Diverting Run-off – Berms. (Ref d – 4.3.3) <input type="checkbox"/> Protection of Storm Drains and Culvert Inlets. (Ref d - 4.6.1, 4.6.2) <input type="checkbox"/> Ditches and Channels. (Ref d - 4.6.4 - 4.6.7) <input type="checkbox"/> Protecting Slopes and Disturbed Areas. <input type="checkbox"/> Installing Sediment Barriers – Silt Fencing. (Ref d - 4.5.1) <input type="checkbox"/> Sediment Basins / Traps. (Red d - 4.7) <input type="checkbox"/> Temporary Stream Crossings (Ref d – 4.8.3). Note: This feature will require additional permits from the US ACE (Section 404 permit) and KY DOW (Section 401 permit). <input type="checkbox"/> Concrete Washout with signage. (Ref a – Section 10) (Ref d - 4.9.6) <input type="checkbox"/> Vehicle and Equipment Cleaning. (Ref a – Section 10) (Ref d - pg 46) <input type="checkbox"/> Solid Waste / Trash / Debris Management. (Ref a – Section 10) <input type="checkbox"/> Material Delivery, Storage, and Handling. (Ref a – Section 10) (Ref d – 4.9.1) <input type="checkbox"/> Sanitary / Septic Waste Management. (Ref a – Section 10) (Ref d – 4.9.7) <input type="checkbox"/> Vehicle Fueling and Maintenance. (Ref a – Section 10) (Ref d – 4.9.3) <input type="checkbox"/> Hazardous Materials and Waste Management. (Ref a – Section 10) (Ref d – 4.9.5) <input type="checkbox"/> Pesticides, Herbicides, and Fertilizers. (Ref a – Section 10) <input type="checkbox"/> Sensitive and vegetated area preservation. (Ref a – Section 10) <input type="checkbox"/> Dewatering Operations. (Ref a – Section 10) |



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| | <p>Inspection and Maintenance Requirements for BMPs have been included and labeled: (Ref d – Section 3.5 and 3.7)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Frequency of Maintenance Activities. (Ref a – Section 10) <ul style="list-style-type: none"> <input type="checkbox"/> Sediment control device cleaning schedule. <input type="checkbox"/> Water Quality Unit (WQU) cleaning schedule, if applicable. <input type="checkbox"/> Frequency of Inspection Activities. (Ref a – Section 10, Section 12) (Ref d – Section 3.7) <ul style="list-style-type: none"> <input type="checkbox"/> At least once every seven (7) calendar days, and <input type="checkbox"/> Within 24 hours after any storm event of 0.5 inches or greater <input type="checkbox"/> Inspections shall be done by a qualified person. (Ref a – Section 12) (Ref d – Section 3.7) <input type="checkbox"/> Inspections shall be completed using the Oldham County Stormwater Construction Site Inspection Report form. (Ref a – Section 12) |
| | <p>Project Engineer’s Estimate:</p> <ul style="list-style-type: none"> <input type="checkbox"/> A detailed quantity estimate for stormwater management controls and EPSC measures has been provided. (Ref a – Section 10) <input type="checkbox"/> The detailed quantity estimate is 130% of the estimated total. |



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| DRAINAGE CALCULATION GUIDANCE | |
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| | <p>Drainage Calculations:</p> <ul style="list-style-type: none"> <input type="checkbox"/> For projects being constructed in phases (e.g., Sub-division A, Phase 1; Sub-division A, Phase 2, etc.), the drainage/stormwater plans and calculations for the entire subdivision have been submitted with the Phase 1 plans and calculations. <input type="checkbox"/> For subsequent phases, the calculations have been updated based on the “as-built” condition for each previous phase (e.g., Calculations submitted as part of Phase 2 has been updated for the “as-built” condition from Phase 1). |
| | <p>Calculations include an executive summary that discusses the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Description of the project site. <input type="checkbox"/> Watershed (Description and picture). <input type="checkbox"/> Predominant soil types. <input type="checkbox"/> Cover. <input type="checkbox"/> Proposed Impervious Areas. <input type="checkbox"/> Proposed Outfall Locations / Descriptions. <input type="checkbox"/> Summary of pre-development and post-development calculations. <input type="checkbox"/> Picture of Watershed Areas/Sub-Areas for the Project Site. |
| | <p>Existing and Proposed Drainage Patterns: (Ref d – Section 3.5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Off-site drainage areas entering the site have been noted. <input type="checkbox"/> Drainage leaving the site has been noted. |
| | <p>Drainage areas have been shown to all points of discharge (location, type, etc.) for: (Ref a – Section 10, Ref d – Section 3.5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pre-development. <input type="checkbox"/> Post-development. <input type="checkbox"/> An overall area map has been provided that shows sub-basins for each collection point. |
| | <p>Soil Assessment Description and Calculations for Rational Method (if used) have been provided and include the following: (Ref h – 10.2.3.1.2.d*)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Soil Description (Type). <input type="checkbox"/> Hydrologic Soil Group. <input type="checkbox"/> Land Use. <input type="checkbox"/> Runoff Coefficient (C). <input type="checkbox"/> Composite C (if applicable). |
| | <p>Soil Assessment Description and Calculations for NRCS Method (if used) have been provided and include the following: (Ref h – 10.2.3.2.3*)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Soil Description (Type). <input type="checkbox"/> Hydrologic Soil Group. <input type="checkbox"/> Cover Type Description. <input type="checkbox"/> Runoff Curve Number (CN). <input type="checkbox"/> Composite CN (if applicable). |
| | <p>Storm Sewer Inlets and Closed Pipe Systems: (Ref b – Section 5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> The 10-year, 24-hour storm has been used for all sewer inlets and closed pipe systems. <input type="checkbox"/> The 10-year flow is less than the pipe capacity. |



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| | <p>Storm Sewer Channels and Ditches Sizing: (Ref b – Section 5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> The 10-year storm has been used for all channels and ditches. <input type="checkbox"/> The 100-year flow is contained within the easement (Ref h – 10. 3.5.1.a.2*). |
| | <p>Flooding or Surcharging Storm Sewer Systems: (Ref b – Section 5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> The 100-year storm has been used as a check for all storm sewer systems. <input type="checkbox"/> Storm sewer systems are able to contain the 100-year storm at levels below the rim opening to prevent surcharging when routing the storm through the system to the basin. |
| | <p>Pre-Development/Post-Development Runoff: (Ref b – Section 5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> The 10-year, and 100-year storm have been used to calculate Pre-development Runoff and Post-development runoff from a site for detention, retention, and sediment control basins. <input type="checkbox"/> The Post-development peak flow rates are less than or equal to the Pre-development peak flow rates for the 10-year, and 100-year storm. |
| | <p>Flooding or Surcharging Basins: (Ref b – Section 5)</p> <ul style="list-style-type: none"> <input type="checkbox"/> The 100-year (Type II, 24hour) storm has been routed through the system and used for all detention, retention, or sediment control basins. <input type="checkbox"/> Flooding or surcharging is not present for this design storm. |
| | <p>Runoff Calculation Method:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The runoff calculation method used in the calculations has been specified and is acceptable for use? (Ref b – Section 5.2). <input type="checkbox"/> The Rational Method and Modified Rational Method has been used for small areas (areas less than 50 acres) (Ref h – Section 10.2*). <input type="checkbox"/> The NRCS method (TR-20 or TR-55) has been used for larger areas (areas greater than 50 acres) (Ref h – Section 10.2*). <input type="checkbox"/> The NRCS method (TR-20 or TR-55) has been used with the NRCS Type II, 24-hour rainfall distribution. |
| | <p>Time to Concentration (Tc): Flow paths, variables (n, L, P, s, etc.), and supporting calculations for sheet, shallow concentrated, and open channel flow have been provided (Ref g – Ch 3, Ref h – 10.2.3.1.2.c*):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pre-development. <input type="checkbox"/> Post-development. <p>Note: The minimum Tc shall not be less than 0.1hrs to any inlet or analysis point. Minimum Tc of 10 minutes is acceptable (Ref h – Section 10.2.3.1*).</p> |
| | <p>Tc Calculations have been summarized in an “Area Table” that includes:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Area Drained (A). <input type="checkbox"/> Manning’s Roughness Coefficient (n). <input type="checkbox"/> Rainfall (P) (2-year, 24-hour rainfall). <input type="checkbox"/> Time to Concentration (Tc). |
| | <p>Peak Discharge Calculations, for each design storm, have been provided for (Ref b – Section 5 & 5.2):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pre-development. <input type="checkbox"/> Post-development. <input type="checkbox"/> Post-development – Peak Discharge Controlled. <input type="checkbox"/> Peak discharge calculations include on-site and off-site drainage entering the project site. |
| | <p>Hydrographs, for each design storm, have been provided for:</p> |



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| | <input type="checkbox"/> Pre-development. <input type="checkbox"/> Post-development. <input type="checkbox"/> Post-development – Peak Discharge Controlled. |
| | Retention/Detention Basin Details have been provided and include the following: (Ref h – 10.3.8*) <ul style="list-style-type: none"> <input type="checkbox"/> Capacity (Elevation, Volume). <input type="checkbox"/> Water Surface Elevation (WSE) for 10yr and 100yr design storms. <input type="checkbox"/> Outlet Structure, which matches calculations. <input type="checkbox"/> Emergency Spillway Calculations, which matches calculations. <input type="checkbox"/> Velocity Dissipation Calculations. <input type="checkbox"/> Inflow / Outflow Calculations. |
| | Retention/Detention Basin details match the details provided within the plan set. |
| | Water Quality Volume (WQV) Calculations have been provided. (Ref b – Section 5.3) <ul style="list-style-type: none"> <input type="checkbox"/> Calculations include project site acreage. <input type="checkbox"/> WQv equation from Section 5.3 of reference b has been used. <input type="checkbox"/> Correct rainfall depth (P) from Section 5.3 of reference b has been used. <input type="checkbox"/> 2-year storm has been used for flow rates. |
| | Water Quality Treatment Devices and/or Features: <ul style="list-style-type: none"> <input type="checkbox"/> Design features are detailed. <input type="checkbox"/> Detail Sheets and Specifications have been provided for devices (if applicable). |



Plan Content and Design Guidance

Oldham County Engineer

STORMWATER LAYOUT PLAN GUIDANCE

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| | <p>Stormwater facilities:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Location of existing / proposed piping have been included and labeled. <input type="checkbox"/> Location of existing / proposed stormwater facilities (i.e., manholes, catch basins, headwalls, inlets, stubs, etc.) have been included and labeled. <input type="checkbox"/> Brief description of stormwater facilities have been included and labeled. <input type="checkbox"/> Each facility has been labeled and numbered <input type="checkbox"/> Labeling of stormwater facilities aligns with Pipe Chart. <input type="checkbox"/> Stationing for all drainage structures has been included and labeled. <input type="checkbox"/> Downspout connections have been identified and labeled. |
| | <p>All connecting stormwater system piping and culverts on adjacent properties have been identified.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Upstream stormwater connections have been identified. <input type="checkbox"/> Downstream stormwater connections have been shown to maintain the capacity needed to receive stormwater from the new development. <input type="checkbox"/> Calculations have been provided for, a minimum, of two downstream structures. |
| | <p>Direction of flow (flow arrows) has been shown for all Ditches, Swales, Open Channels, and Pipes.</p> |
| | <p>Stormwater system alignment:</p> <ul style="list-style-type: none"> <input type="checkbox"/> In addition to typically accepted design standards, sharp bends in swales and ditches have been eliminated. |
| | <p>Pipe Chart for all stormwater system pipes has been provided and includes the following (Ref j):</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pipe Number. <input type="checkbox"/> Contributing Area Drained (A). <input type="checkbox"/> Total (Composite) Area Drained. <input type="checkbox"/> Runoff Coefficient (C). <input type="checkbox"/> A x C (individual). <input type="checkbox"/> A x C (Composite). <input type="checkbox"/> Intensity (I_{10} and I_{100}). <input type="checkbox"/> Total Flow (Q_{10} and Q_{100}). <input type="checkbox"/> Pipe Diameter. <ul style="list-style-type: none"> <input type="checkbox"/> Minimum of 12 inches (Ref h – Section 10.3.1.4*). <input type="checkbox"/> Manning’s Coefficient (n). <input type="checkbox"/> Pipe Length. <input type="checkbox"/> Pipe Slope (minimum slope to satisfy minimum velocity at design flow). <input type="checkbox"/> Pipe Material. <ul style="list-style-type: none"> <input type="checkbox"/> Recommend pipe material as approved by MSD Standard Specifications (Ref h – Section 10.3.1.2*). <input type="checkbox"/> Pipe Capacity. <input type="checkbox"/> Velocity (V_{10} and V_{100}) . <ul style="list-style-type: none"> <input type="checkbox"/> Recommended minimum of 2fps (design flow) or 3fps (full flow) whichever requires the greater slope (Ref h – Section 10.3.1.4*). <input type="checkbox"/> Recommended maximum of 15fps (design flow). <input type="checkbox"/> Headwaters (HW_{10} and HW_{100}). |



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STORMWATER LAYOUT PLAN GUIDANCE

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| | <ul style="list-style-type: none"> <input type="checkbox"/> Depth (D₁₀ and D₁₀₀). <input type="checkbox"/> “Inlet” Time. <input type="checkbox"/> “System” Time. <p>Note: Rainfall intensity shall be obtained from the Rainfall Intensity-Duration-Frequency (IDF) curves developed for Metro Louisville (Ref b – Section 5).</p> |
| | <p>Manhole spacing has been addressed. (Ref h – Section 10.3.1.4*)</p> |
| | <p>Driveway Culverts have been designed to the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Minimum 20-feet long. <input type="checkbox"/> Sized for 10-year design storm. <input type="checkbox"/> Minimum pipe diameter of 15 inches provided. |
| | <p>Stubs:</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1-foot long stubs have been provided. (Ref h – Section 10.3.1.4*). |
| | <p>Detention Basin Details:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Total site area has been indicated. <input type="checkbox"/> Total area to basin (i.e., contributing drainage areas) has been indicated. <input type="checkbox"/> Basin Volume Data has been indicated. <input type="checkbox"/> Water surface elevation (WSE) for 10-year and 100-year storm has been indicated. <input type="checkbox"/> Top of berm elevation has been indicated. <input type="checkbox"/> Construction details for basin, embankment, and outlet devices (i.e., dam embankment compaction requirements, riser, barrel, perforations, trash rack, anti-seep collars, etc.) has been indicated. <input type="checkbox"/> Construction drawings align with supporting calculations for the riser, barrel, perforation, and outlet details. (Ref d - 4.7.2) has been indicated. <input type="checkbox"/> Emergency spillway has been provided and accommodates 100-year post development peak flow. <input type="checkbox"/> Emergency spillway dissipater extends a minimum 4feet beyond the base of the dam (Ref b – Section 5). <input type="checkbox"/> All Basins drain to an adequate outfall. Calculations demonstrate adequacy of the outfall (e.g., demonstrate that the selected outfall can contain the storm flow within its design limits). <input type="checkbox"/> Detention basins comply with Ref h – Section 10.3.8*. <input type="checkbox"/> Trees are not located within the detention basin or on detention basin embankments. |
| | <p>Underground Detention has the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Venting. <input type="checkbox"/> Access for maintenance. <input type="checkbox"/> Structurally designed for loads. |
| | <p>Street Gutters and Inlets:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Gutter details align with calculations. <input type="checkbox"/> Gutter flows/spread and depth calculations at face-of-curb have been submitted (Ref h – Section 10.3.7*). <input type="checkbox"/> Inlet placement has been based on calculations. |



Plan Content and Design Guidance

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STORMWATER PROFILE PLAN GUIDANCE

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| | <p>Profiles of all proposed stormwater system piping and culverts include the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Piping. <input type="checkbox"/> Location of stormwater facilities (manholes, catch basins, headwalls, inlets, etc.). (Locations include Label, Description, Type, Elevation, Invert Elevation, Rim Elevations, etc.). <input type="checkbox"/> Inlets (type, grate elevation, invert elevation, etc). <input type="checkbox"/> Pipe material, length, diameter, percent grade, invert elevation. <input type="checkbox"/> Headwaters for 10-year and 100-year. <ul style="list-style-type: none"> <input type="checkbox"/> Allowable headwaters as outlined in Ref h – Section 10.3.3.2*. <input type="checkbox"/> Crossings with existing / proposed utilities (sanitary, water, gas, etc.). <input type="checkbox"/> Clearance for all pipe crossings has been shown. <input type="checkbox"/> Hydraulic Grade Lines (HGL) for 10-year, and 100-year design storms (Supporting calculations provided. Details regarding how the starting water surface elevation was obtained has been included). <ul style="list-style-type: none"> <input type="checkbox"/> 100-year HGL is below the ground line or building drain elevation (Ref h – Section 10.3.2.1*). <input type="checkbox"/> Stationing for all piping and structures. <input type="checkbox"/> The limits of the right-of-way have been depicted for piping and culverts that cross a public right of way. <input type="checkbox"/> Design cover has been provided based on pipe material. <input type="checkbox"/> Pipe Chart from the Stormwater Plan is also provided. |
| | <p>Profiles of all proposed ditches, swales, and open channels include the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Length, percent grade, elevation. <input type="checkbox"/> Flow (Q_{10} and Q_{100}). <input type="checkbox"/> Velocity (V_{10} and V_{100}). <input type="checkbox"/> Flow depth (d_{10} and d_{100}). <input type="checkbox"/> Design depth. <input type="checkbox"/> Shear Stress. <input type="checkbox"/> Stationing. <input type="checkbox"/> Roughness Coefficient (“n” value). <input type="checkbox"/> Flow line elevation at grade changes (PVI). |
| | <p>Cross Sections for all ditches, swales, and open channels:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cross sections have been depicted looking up-station. <input type="checkbox"/> Pipe crossings have been shown. <input type="checkbox"/> Utilities, easements, and right-of-way have been shown. <input type="checkbox"/> Cross sections have been shown for every 25-feet and where flow is added. |
| | <p>Channels and Ditches:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Minimum channel slope, side slopes, depths, and lining conform to Ref h – Section 10.3.5*. |
| | <p>Pipe Outlet/Outfall Details:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Outfalls into creeks and ditches point downstream. <input type="checkbox"/> Pipe outfall flowline are within one foot of creek flowline. <input type="checkbox"/> Outfall protection has been provided at creek or ditch. |



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STORMWATER PROFILE PLAN GUIDANCE

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| | <ul style="list-style-type: none"> <input type="checkbox"/> Riprap apron for $V \geq 6.5\text{fps}$ <input type="checkbox"/> Energy dissipator at headwall and riprap apron for $V \geq 13\text{fps}$ <input type="checkbox"/> 100-year WSE at outfall for all ponds, creeks, and channels has been shown. |
| | <p>Outlet/Outfall Details provide the following details:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Type of outlet/outfall indicated. <input type="checkbox"/> Velocity indicated. <input type="checkbox"/> Graded for positive drainage. <input type="checkbox"/> Pipe end treatments have been addressed. <input type="checkbox"/> Outlet protection (i.e., Riprap, etc.) has been addressed. <input type="checkbox"/> Energy Dissipaters has been addressed. <input type="checkbox"/> Flow control devices (length, width, depth, including filter fabric lining) have been addressed. |
| | <p>Stormwater pipes with grades greater than or equal to 20% have been furnished with pipe anchors at each pipe joint (Ref h – Section 10.3.2.1).</p> |



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| ROAD PROFILE PLAN GUIDANCE | |
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| <i>(To facilitate ease in reading, multiple sheets may be used in order to depict all required information)</i> | |
| | Classifications for all Roads have been provided. (Ref e – Section 5.3, Ref k, Ref l) |
| | Design Speed for Roads have been provided. |
| | Existing / Proposed Ground Line have been included and labeled. |
| | Road Cross Section has been provided at 25-foot intervals. |
| | Vertical Curve Information includes the following: <ul style="list-style-type: none"> <input type="checkbox"/> Stationing. <input type="checkbox"/> Elevations. <input type="checkbox"/> PVC. <input type="checkbox"/> PVI. <input type="checkbox"/> PVT. <input type="checkbox"/> Crest/Sag location. <input type="checkbox"/> Curve Length. <input type="checkbox"/> Grade Percentages. <input type="checkbox"/> “K” values satisfy recommended minimums. |
| | Street Grades have been included and labeled. (Ref e – Section 7.1) |
| | Drainage inlets have been shown on road profile |
| | Drainage inlets account for sag conditions (Ref h - Section 10.3.7*) |



Plan Content and Design Guidance

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INTERSECTION GRADING PLAN GUIDANCE

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| | Top Of Curb Elevations have been included and labeled. |
| | High Point (H/P) have been included and labeled. |
| | Low Point (LP) have been included and labeled. |
| | Direction Flow Arrows have been included and labeled. |
| | ADA design standards have been addressed. |
| | Stormwater runoff flow intercepted at upstream side of curb ramps. |



Plan Content and Design Guidance

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| DETAILS PLAN GUIDANCE | |
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| <i>(The details outlined below are the minimum recommended, as applicable, based on project particulars)</i> | |
| | Trench Details have been included and labeled for: <input type="checkbox"/> Utility Installations. |
| | EPSC Details for the following have been included, labeled, and conform to reference d: <input type="checkbox"/> Concrete Washout Detail with Signage. <input type="checkbox"/> Silt Fence Detail. <input type="checkbox"/> Inlet Protection Detail. <input type="checkbox"/> Outlet Protection Detail. <input type="checkbox"/> Rock/Stone Bag Check Dam Detail. <input type="checkbox"/> Rock/Stone Check Dam Detail. <input type="checkbox"/> Rock/Stone Rip Rap Installation Detail. <input type="checkbox"/> Construction Entrance/Exit Detail. <input type="checkbox"/> Stream Crossing (if applicable). |
| | Sidewalk Detail has been included and labeled. |
| | Concrete Pavement Details: <input type="checkbox"/> Have been included and labeled for all driving surfaces. |
| | Asphalt Pavement Details: <input type="checkbox"/> Have been included and labeled for all state surfaces. <input type="checkbox"/> State surfaces comply with state road standards. <input type="checkbox"/> Have been included and labeled for all county surfaces. <input type="checkbox"/> County surfaces comply with county road standards. |
| | Keyway Details have been included and labeled. <input type="checkbox"/> Have been included and labeled for County and State keyways. <input type="checkbox"/> Conform to Oldham County road standards or State road standards within ROW. |
| | Curb and Gutter Details have been included and labeled. |
| | Curb to Catch Basin Details have been included and labeled. |
| | Ditch Details have been included and labeled and include the following: <input type="checkbox"/> Side Slope. <input type="checkbox"/> Protection. |
| | Parking Details have been included and labeled. |
| | Details for ADA compliant features have been included and labeled. |