IOWA ENGINEERING JOB APPROVAL AUTHORITY

Name	**Title**	**Grade**
Determined By	**Title**	**Date**
Concurrence By	**Title**	**Date**

Code	Job Type	Controlling Factors		Units	Job Class I	II	III	IV	V	Maximum Approval Limits I&E	Design	Constr.
378	Pond	Requires permit from IDNR or other regulatory agency 2/		------	No	No	No	Yes	Yes			
402	Dam	Hazard Classification			Low	Low	Low	Low	Low			
410	Grade Stabilization Structure	Storage x Height			<3000	<3000	<3000	<3000	3000			
587	Structure for Water Control	Effective Height 1/ 2/		Feet	8	12	25	30	35			
	All with relatively impervious cutoff, simple foundation needs, and standard or proven designs.	Conduit Spillway - Inside Diameter		Inches	6	12	24	42	All			
		Drainage Area 2/		Acres	20	80	250	640	12,800			
	Notes: 1/ The effective height of the dam is the difference in elevation in feet between the auxiliary spillway crest and the lowest point in the cross section taken along the centerline of the dam.	Drop Spillway 3/	Net Drop	Feet	2*	4*	4*	6*	All			
			Weir Depth	Feet	2*	2*	3*	4*	All			
			Weir Capacity	CFS	50	150	300	400	All			
		Steel or Aluminum Drop Spillway (Toewall)	Net Drop	Feet	2*	3*	4*	6*	All			
			Weir Capacity	CFS	50	150	300	600	All			
		Steel Sheet Pile	Net Drop	Feet	2*	4*	6*	8	All			
			Weir Capacity	CFS	0	0	400	600	All			
		Rock Chute	Net Drop	Feet	0	4*	8*	10	All			
			Weir Capacity	CFS	0	50	150	300	All			
	2/ These limits apply to all practices which store water including terraces, water and sediment control basins, diversions, and waste storage facilities.	Gabion Chute	Net Drop	Feet	0	4	8	10	All			
			Capacity	CFS	0	50	200	300	All			
		Concrete Block Chute	Net Drop	Feet	0	4*	8*	10*	All			
			Capacity	CFS	0	50	150	300	All			
	3/ These limits also apply to gabion drop spillways except that standard designs and drawings are not required.	Reinforced Concrete Chute	Net Drop	Feet	0	0	0	8*	All			
			Weir Depth	Feet	0	0	0	3	All			
			Weir Capacity	CFS	0	0	0	300	All			
	* Standard designs and standard detail drawings. These include all designs and drawings that have been approved for use in Iowa by the State Conservation Engineer.	Reinforced Vegetated Chute Spillway	Net Drop	Feet	0	4*	8*	10	All			
			Capacity	CFS	0	50	100	100	All			
		Box Inlet Drop Spillway Box Inlet to Existing Culvert	Net Drop	Feet	0	0	0	0	All			
			Weir Capacity	CFS	0	0	0	0	All			
		Low Head Dry Dam - Conduit Diameter (Drop through conduit equal to or less than 15 feet.)		Inches	12	24	36	60	All			

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					I	II	III	IV	V	I&E	Design	Constr.
560	Access Road	Length		Miles	0	0.5	1	2	All			
		Circular Culvert	Inside Diameter	Inches	24	36	48	60	All			
		Monolithic Concrete Culvert	Area of Opening	Sq. Feet	0	0	0	0	All			
		Bridge	Span	Feet	0	0	0	0	All			
309	Agrichemical Handling Facility			No.	0	0	0	0	All			
591	Amendments for Agricultural Waste	----		--	0	0	0	0	All			
366	Anaerobic Digester	----		No.	0	0	0	0	All			
316	Animal Mortality Facility	Incinerator - Capacity		Lbs.	0	0	0	400	1,000			
		Freezer		No.	0	0	0	0	All			
		Composting - Standard Design		No.	0	0	All	All	All			
575	Animal Trails and Walkways	Length		Feet	1000	5000	All	All	All			
310	Bedding	Area Treated		Acres	40	160	320	480	All			
326	Clearing and Snagging	Drainage Area		Sq. Miles	0	0	1	4	All			
360	Closure of Waste Impoundments	Surface Area - Full Operation Level		Acres	0	0.5	1.0	4.0	All			
317	Composting Facility	IDNR Permit Required for Livestock Operation			No	No	No	Yes	Yes			
		Forced Aeration		No.	0	0	0	All	All			
		Standard Design		No.	0	0	All	All	All			
656	Constructed Wetland	Animal Waste Treatment	Design Capacity - 1,000 lb Live Animal Weight	No.	0	0	0	300	All			
		Field Runoff Treatment	DA	Acres	0	0	300	1000	All			
348	Dam, Diversion	Streamflow		CFS	0	0	100	500	2,000			
		Flow Diverted		CFS	0	0	10	50	200			
		Height of Drop		Feet	0	0	4*	6*	8			
747	Denitrifying Bioreactor	Pipe diameter		Inches	0	0	0	All	All			
356	Dike	Water Height		Feet	0	0	4	10	All			
		Class		------	0	0	III	III	III			
362	Diversion	Design Capacity		CFS	40	100	200	500	All			
375	Dust Control from Animal Activity on Open Lot Surfaces	Area Treated		Acres	0	0.5	1	5	All			
374	Farmstead Energy Improvement	On farm energy audit recommendations		No.	0	0	0	All	All			
412	Grassed Waterway	Drainage Area		Acres	80	250	500	2,000	All			
561	Heavy Use Area Protection	Surface Protection Method		Type	Vegetative	Vegetative	Gravel	Concrete	All			
442 443	Irrigation System, Sprinkler Irrigation System, Surface and Subsurface	Area Irrigated		Acres	0	0	80	160	All			
430	Irrigation Water Conveyance	Pipeline Capacity	Greater than 50 psi	GPM	0	0	1,000	2,000	3,500			
			Less than 50 psi	GPM	0	0	1,000	3,500	5,000			
527	Karst Sinkhole Treatment	Area Treated		Acres	0	0	0	All	All			

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					I	II	III	IV	V	I&E	Design	Constr.
460	Land Clearing	Area Cleared		Acres	5	10	20	All	All			
466	Land Smoothing	Other Land	Area Treated	Acres	20	80	200	400	All			
			Maximum Cut	Feet	1	2	3	5	All			
468	Lined Waterway or Outlet	Capacity		CFS	0	50	100	100	All			
		Net Drop		Feet	0	4	8	10	All			
634	Manure Transfer	Gravity Flow - Diameter		Inches	0	0	24	30	All			
		Pressurized System - Diameter		Inches	0	0	6	10	All			
353	Monitoring Well	Diameter		Inches	0	0	0	2	All			
500	Obstruction Removal	No Public Safety Hazard During Removal		Each	0	0	0	All	All			
582	Open Channel	Design Capacity		CFS	0	25	50	250	1000			
584	Channel Stabilization	Design Velocity		FPS	0	8	10	10	10			
608	Surface Drain, Main or Lateral											
516	Pipeline	Length - Maximum distance from source		Feet	1,000	1,500	2,500	10,000	All			
		Diameter		Inches	1	1.5	2	4	All			
		Pressure - Maximum operating pressure plus Water hammer		PSI	100	125	160	200	300			
521-A	Pond Sealing or Lining - Flexible Membrane	Surface Area		Acres	0	0	0	10	All			
521-B	Pond Sealing or Lining - Soil Dispersant											
521-C	Pond Sealing or Lining - Bentonite Sealant											
521-D	Pond Sealing or Lining - Compacted Clay											
462	Precision Land Forming	Area Treated		Acres	20	80	160	320	All			
464	Irrigation Land Leveling	Maximum Cut		Feet	1	2	3	5	All			
533	Pumping Plant for Water Control	Propeller Pump	Design Capacity	GPM	0	0	450	1,000	All			
			Static Head	Feet	0	0	8	10	All			
		Centrifugal Pump	Design Capacity	GPM	0	0	0	500	3,500			
			Static Head	Feet	0	0	0	50	350			
		Turbine Pump	Design Capacity	GPM	0	0	0	500	3,500			
			Static Head	Feet	0	0	0	50	500			
566	Recreation Land Grading and Shaping	Area Treated		Acres	0	5	20	40	All			
568	Recreation Trail and Walkway	Length		Miles	0	1	3	5	All			
558	Roof Runoff Management	Area of Roof		Sq. Feet	0	0	10,000	45,000	All			
367	Roofs and Covers	Cover Surface Area		$Feet^2$	0	0	10,000	45,000	All			
350	Sediment Basin	Effective Height of Dam		Feet	8	10	15	30	35			
	* Standard Designs and Drawings	Concrete Basin		-----	No	No	Yes*	Yes*	Yes			
		Others										
		Refer to Controlling Factors for Ponds										

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632	Solid/Liquid Waste Separation Facility	Mechanical Separator	No.	0	0	0	0	All			
		Sediment Basin - Livestock									
		Effective Height of Dam	Feet	8	10	15	30	35			
		Concrete Basin	--	No	No	Yes*	Yes*	Yes			
		Design Capacity - 1,000 lb Live Animal Weight	No.	20	50	100	500	All			
572	Spoil Spreading	Area receiving spoil	Acres	0.5	1	3	All	All			
574	Spring Development	Discharge	GPM	1	5	10	All	All			
578	Stream Crossing	Design Velocity	FPS	0	4	6	9	All			
580	Streambank and Shoreline Protection	Vegetative Protection	-----	0	0	All	All	All			
		Mechanical Protection — Bankfull Capacity	CFS	0	250	500	2,500	5,000			
		Design Velocity	FPS	0	6	8	10	10			
		Water Height above Shoreline	Feet	0	0	0	3	All			
606 620 980 554	Subsurface Drain Underground Outlet Tile Intake Replacement (Interim) Drainage Water Management	Pipe Diameter	Inches	6	12	18	30	All			
607	Surface Drainage, Field Ditch	Design Capacity	CFS	10	20	50	80	All			
		Drainage Area	Acres	60	120	320	640	All			
		Circular Culvert, Inside Diameter	Inches	24	36	48	60	72			
600 638	Terrace Water and Sediment Control Basin (Also refer to Controlling Factors for Ponds)	Fill Height - Distance from top of ridge to ground surface at ridge line	Feet	6	10	15	All	All			
635	Vegetated Treatment Area	Design Capacity - 1,000 lb Live Animal Weight	No.	0	0	0	300	All			
634	Waste Recycling	Gravity Flow - Diameter	inches	0	0	24	30	All			
		Pressurized Systems - Diameter	inches	0	0	6	10	All			
		Reception Tank	No.	0	0	All	All	All			
313	Waste Storage Facility (Controlling Factors for Ponds also apply)	Design Capacity - 1,000 lb. Live Animal Weight	No.	0	0	300	1,000	All			
		IDNR or EPA Permit Required		No	No	No	Yes	Yes			
		Storage Capacity	Cu. Feet	0	0	500,000	1,000,000	2,000,000			
		Earthen Waste Storage Structure									
		Effective Height of Dam	Feet	0	0	20	30	35			
		Other Structures									
		* standard designs and standard detail drawings									
		Below Ground - Wall Height	Feet	0	0	8*	14*	All			
		Span	Feet	0	0	6*	12*	All			
		Above Ground - Wall Height	Feet	0	0	8*	14*	All			
		Span	Feet	0	0	40*	60*	All			
		Round Structures - Diameter	Feet	0	0	0	120*	All			

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629	Waste Treatment	Design Capacity - 1,000 lb. Live Animal Weight	No.	0	0	0	0	All			
		Milking Center Waste Water Produced	Gpd	0	0	0	0	All			
359	Waste Treatment Lagoon	Anerobic - Volume	Cu. Feet	0	0	250,000	500,000	2,000,000			
	(Controlling Factors for Ponds also apply)	Aerobic - Surface Area	Acres	0	0	1	5	25			
		Effective Height of Dam	Feet	0	0	25	30	35			
642	Water Well	Design and Construction to be completed by a well driller certified in Iowa		0	0	0	All	All			
351	Water Well Decommissioning	Diameter	Inches	0	0	6	16	All			
614	Watering Facility			All	All	All	All	All			
981	Wellhead Protection (Interim)	CMP casing		0	0	All	All	All			
		All other casing materials		0	0	0	All	All			
355	Well Water Testing	No.	Each	0	0	All	All	All			
657	Wetland Restoration	DEPRESSION Hydrogeomorphic (HGM) Class									
658	Wetland Creation	T&E or listed species in or near the site		No	No	Yes	Yes	Yes			
659	Wetland Enhancement	Requires Permit from IDNR or other regulatory agency		No	No	No	Yes	Yes			
		Wetland Area	Acres	2	5	10	25	All			
	Refer to the limits for associated practices, as required	RIVERINE HGM Class									
		T&E or listed species in or near the site		No	No	Yes	Yes	Yes			
		Requires Permit from IDNR or other regulatory agency		No	No	No	Yes	Yes			
	Wetland area includes all land classified as wetland or expected to meet wetland criteria in the project area following project completion.	Wetland Area	Acres	2	5	10	25	All			
		Channel Modification planned		No	No	No	Yes	Yes			
		Channel/Stream Corridor Restoration		No	No	Yes	Yes	Yes			
		Protected Floodplain		No	No	Yes	Yes	Yes			
	See Engineering Field Handbook Chapter 13, for definitions of HGM classes.	SLOPE HGM Class									
		T&E or listed species in or near the site		No	No	Yes	Yes	Yes			
		Requires Permit from IDNR or other regulatory agency		No	No	No	Yes	Yes			
	Also refer to other applicable standards.	Wetland Area	Acres	2	5	10	25	All			
		Grade Stabilization/Water Surface Profile Modification		No	No	Yes	Yes	Yes			
		Organic Soil		No	No	No	Yes	Yes			

DEFINITIONS OF MAXIMUM APPROVAL LIMITS COLUMNS

Inventory and Evaluation (I&E) - On-site observations of an exploratory nature and preparation of sound alternative solutions of sufficient intensity for the cooperator to make treatment decisions.

Design - Designing and checking all aspects of the supporting data, drawings, and specifications to insure that the planned practice will meet the purpose for which it is installed.

Construction - Surveys, layout, staking, inspection of materials and work, and making tests to determine that the job meets specifications.

Inventory of Engineering Skills

(For use in determining the level of design and construction approval authority)

Yes or No

Surveying Skills

	Laser level or Self-leveling level
	Adjustment of Laser or Self-leveling levels
	Digital Transit
	Total Station
	Total Station – multiple setups with turns
	Survey Grade GPS
	Construction Staking using Total Station or GPS

CADD Skills

	Survey Import & Adjustment
	Contour Development
	Storage Volume computations
	Design layout & surface creation of planned construction
	Profiles & cross-sections
	Earthwork quantities
	Prepare final construction drawings
	Export of staking information to data collector
	LiDAR importing / GPS ground truth checks

Design Skills

	Meets all Core Course Requirements for the Position
	Can develop a stage storage table
	Can balance Cuts and Fills
	Can develop a cost estimate
	Can develop data input for Engineering Plan Development Software
	Can use Engineering Plan Development Software
	Can customize IA construction and material specifications for specific jobs
	Knows where to use and how to complete standard base drawing sheets
	Can assemble non-complex Plans and Contract information
	Can assemble complex Plans and Contract information

Construction Skills

	Concrete and Steel placement (inspection only)
	Concrete and Steel placement (inspection and concrete testing)
	Conduit installation (smooth steel pipe)
	Conduit installation (plastic pipe)
	Conduit installation (concrete pipe)
	Conduit installation (corrugated metal pipe)
	Conduit installation (pipe with cathodic protection)
	Construction Surveys (Non-complex Plans, elevation/baseline/cross section surveys)
	Construction Surveys (Complex Plans, radial layout and curves)
	Drainfill (Proper Placement)
	Drainfill (Gradation Testing)
	Can judge if IA construction and material specifications are being followed
	Can judge if NEH 20 construction and material specifications are being followed
	Can judge if Standard Drawings are being followed
	Can judge if construction complies with the terms of a non-complex contract
	Can judge if construction complies with the terms of a complex contract
	Can determine if Class C (method) compaction requirements are met
	Can do the testing associated with Class A compaction requirements
	Can judge if backfill adjacent to structures is adequate
	Can do a field identification using the United Soil Classification System