	T.I. PROJECT NAME: T.I. PROJECT NUMBER: ARCHITECT/ ENGINEER OR RECORD:	
	TYPE I & TYPE II HOOD SYSTEM DESIGN GUIDELINES	**COMPLETE**
	DESIGN	**DESIGNER**
1	Port standards for Type I and Type II hood systems equal or exceed IMC (International Mechanical Codes) and NFPA standards.	
2	The mechanical engineer of record shall coordinate the design of the hood systems with the cooking kitchen equipment manufacturer and is responsible for the performance of the systems.	
3	During the initial design phase the designer of record shall provide submittal of the hood/cooking equipment that will contain the following data: type, size & duty classification of the appliances served by the hood, exhaust fan size, duct and hood air velocities and cut sheets of the type and lay out of the cooking equipment that will operate under the hood. In accordance with Port Mechanical Standard section 233500 and IMC 507.5.	
4	No Make -up Air Units are allowed for hoods at SeaTac Airport. Obtain variance from Airport Building Department.	
5	No stand-alone hood control panels are allowed for hoods at SeaTac Airport. All exhaust fan controls and interlocks shall be performed and scheduled by the DDC system without a tenant "off" switch (other than fire shutdown or other safety shutdown push button switch)	
6	The Port standards require an interlocking system between the exhaust fan and the fuel source of the cooking equipment located underneath the hood system. This interlocking system shall be controlled via DDC (Direct Digital Controls) and its sequence of operations must be shown on the plans. Siemens is the Port approved DDC provider. During the design phase the designer of record shall contact Siemens Inc. and ensure compliance with Port DDC requirements (see Port Mechanical Standard section 200920). **Contact Siemens PM Mohsen Seyedsagha: mohsen.seyedsagha@siemens.com or call 206-291-8368.**	
6A	Type I - Natural Gas piping to cooking equipment to be provided with a common natural gas solenoid valve. DDC sequence of operation closes gas valve upon fire situations (adjacent zone or space specific either under hood or in space), or due to hood temperature interlock (exhaust fan is off or fails to proof with a high hood temperature). Natural gas valve to reopen upon clearing of all alarms. During unoccupied periods without a fire situation or hood temperature interlock, exhaust fan off situation should <u>not</u> close natural gas valve.	
6B	Type I Electric supply to cooking equipment to include a single common relay contactor installed by electrical contractor (division 26) for all cooking equipment that needs to be disconnected under hood. Controls sequence of operations (DDC) to interrupt power to common contactor upon fire situations (adjacent zone or space specific either under hood or in space), or due to hood temperature interlock (exhaust fan is off or fails to proof with a high hood temperature).	
6C	Type II hoods required over electrical cooking equipment to include a single common relay contactor installed by electrical contractor (division 26) for all cooking equipment that needs to be disconnected under hood. Controls sequence of operations (DDC) to interrupt power to common contactor if exhaust fan is off or fails to proof during occupied hours .	

7	Fire Extinguishing System: Automatic systems shall be provided for protection of hood, ducts and cooking equipment. The system is required to be installed with a connection (relay contact) to the fire alarm system and the Siemens DDC.	
8	Fire Alarm System to provide a common signal to DDC for all space alarms. Space is defined as the restaurant space including both public and back of house areas. (Note this is a separate relay from the Fire Extinguishing system required on Type 1 hoods item 7).	
9	The mechanical engineer of record shall calculate airflow to operate the hood location slightly negative with respect to the rest of the facility by specifying the ventilation air pass-through to the kitchen and advising the architect as to sizing of openings between "Front and Back of the house" so that kitchen space is negative with respect to adjacent space.	
10	The exhaust fans must be able to handle the total heat load/smoke of the cooking equipment (see IMC 2015 Section 507.5).	
11	If two hoods are adjacent/close enough to cause any type of interference with the operation of each other, the mechanical engineer of record must prove that each hood exhaust can handle the equipment located under the respective hood without being interfered with by the other hood. The interference will be included in the test plans and proven to be effective during testing (see items under the testing section below)	
12	Type 1 hoods above both steamer and fryer equipment (woks, kettles, etc.) shall be equipped with an automatic water wash system controlled independently from the DDC.	
13	Type 1 hood grease ductwork must be liquid tight and pressure-tested in accordance with Port Mechanical Standard section 233500.	
14	Each Type 1 hood shall be provided with 2 sets of High Efficiency baffle filters (see Port Mechanical Standard 233500).	
15	The hood size shall extend not less than 6 " beyond the edge of the top horizontal surface of the cooking equipment on all open sides. (see IMC 2015 Section 507.4.1) Indicate overlap in plan view.	
16	The grease duct enclosure requirements of IMC 506.3.11 shall be indicated in the drawings.	
17	The slope and the length of the grease duct must meet the code requirements (see IMC 2015 section 506.3.7). Field verification is required.	
18	The mechanical engineer of record must show on plans a dimensioned exhaust "one line diagram" system indicating the type, size and location of ducts, cleaning access hatches and grease containment system (see IMC 506.3.13 & IMC 506.4 for termination requirements).	
19	Provide clean outs for the grease duct (see IMC 2015 Section 506.3.9). Show the clean outs in the drawings with minimum 36" maintenance clearance. Access panels' openings must be fire resistive (see IMC 2015 Section 506.3.12).	
20	Type I and type II hood exhaust fans shall include hinged curbs; type I hoods shall include total fan grease containment systems (see Port Mechanical Standard 233500).	
21	Dampers: Required dampers must have shafts that extend to outside of duct. No actuator should be installed inside the duct. Dampers must be accessible for maintenance without removing any equipment for access. Damper should not include an integral actuator, actuator will be provided separately as part of controls scope (DDC).	

	CONSTRUCTION	G.C.	PORT
22	During construction, coordination between the GC and Port Facilities Manager needs to take place to mandate inspection by the POS FM for cleaning access hatches location/accessibility before ceiling closure and final hood test.		
	TESTING & COMMISIONING	**G.C.**	**PORT**
23	The mechanical engineer of record shall include all the following tests in the design documents and include a complete sequence of operation to be used during commissioning. Either the designer of record or a commissioning agent must write and submit for approval a complete test plan for commissioning and be present during commissioning.		
24	The type 1 hood grease ductwork shall have light testing completed as per IMC 506.3.2.5 and pressure testing completed as per Port Mechanical Standard section 233500. This testing may occur during construction phase.		
25	All hoods and exhaust fans in kitchens shall be tested and reported for total CFM and capture velocities as part of Mechanical test and balance. The hood system, including all HVAC terminal units, must be operational at the time of the TAB. The test must be completed by the Testing and Balancing agencies qualified by the Port (see Port Mechanical Standards 200593 & 233500).		
26 26A 26B	General Contractor and all sub contractors upon equipment installation and completion of all work (wiring, relays, Siemens, Fire panel integration and Electrical) should perform pre-functional testing BEFORE scheduling commissioning and testing that will be witnessed. (Item 27). General Contractor is responsible to assure that Siemens has the final sequence of operation (either permit set or subsequent revisions) for programming of the DDC and that all DDC programming is complete. Note that some testing may need to be completed at night and/or coordinated with other restaurants. For example if a Zone fire alarm adjacent to the space needs to be activated, that will also shutdown other restaurant gas valves.		
27	Commissioning and a functional interlock controls test including exhaust fan start, fire shut down, fire extinguishing (Ansul) system and cooking energy source shut down will be performed when the controls systems (Fire and Siemens DDC) are fully operational (See requirements in Item 26) and before the final approval by the Airport Building and Fire Departments (see IMC 507.1.1). This Interlock test needs to be directed by Engineer of Record or Commissioning agent and witnessed by Maintenance, ADR, F&I, Fire department, Airport building Department and tenant owner representative unless individually waived.		
28	A final hood performance test demonstrating capture of all cooking effluent shall be performed upon completion of the above and before the final approval by the Airport Fire and Building Departments (see IMC 507.6). The cooking test will include multiple items from the menu including the most grease or steam producing items. The cooking test needs to be witnessed by F&I Mechanical Engineer, Airport building Department and ADR Project Manager, unless individually waived.		
29	The G.C. shall be responsible to coordinate/schedule the above tests with the Port entities as required by the Port standards and code requirements. This testing requires a significant amount of time and should be planned for, including advance notice of at least 48 hours to all Port departments.		